EUROPEAN MICROWAVE WEEK 2019
PARIS EXPO PORTE DE VERSAILLES, PARIS, FRANCE
1 place de la Porte de Versailles
29TH SEPTEMBER - 4TH OCTOBER 2019
Co-sponsored by:

The 49th European Microwave Conference
The 16th European Radar Conference

Register online at:
www.eumweek.com
European Microwave Week 2019 Sponsors

The organisers would like to thank the following companies for their help and valued support throughout this year’s event:

Platinum Sponsor

KEYSIGHT TECHNOLOGIES

COPPER MOUNTAIN TECHNOLOGIES

MiCIAN

ROHDE & SCHWARZ

Université de Limoges  xlim  IMS  INSA  IETR
<table>
<thead>
<tr>
<th>Sponsors</th>
<th>Inside Front Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome Messages</td>
<td>4</td>
</tr>
<tr>
<td>EuMW 2019 Special Issue</td>
<td>10</td>
</tr>
<tr>
<td>The EuMW 2019 Team</td>
<td>11</td>
</tr>
<tr>
<td>Prizes and Awards</td>
<td>12</td>
</tr>
<tr>
<td>Conference Committees</td>
<td>14</td>
</tr>
<tr>
<td>General Information</td>
<td>18</td>
</tr>
<tr>
<td>Social Events</td>
<td>20</td>
</tr>
<tr>
<td>Conference Registration Information</td>
<td>21</td>
</tr>
<tr>
<td>Special Conference Events</td>
<td>24</td>
</tr>
<tr>
<td>Partner Programme</td>
<td>30</td>
</tr>
<tr>
<td><strong>CONFERENCE PROGRAMME</strong></td>
<td></td>
</tr>
<tr>
<td>Monday 30th September</td>
<td>32</td>
</tr>
<tr>
<td>Tuesday 1st October</td>
<td>36</td>
</tr>
<tr>
<td>Wednesday 2nd October</td>
<td>46</td>
</tr>
<tr>
<td>Thursday 3rd October</td>
<td>58</td>
</tr>
<tr>
<td>Friday 4th October</td>
<td>66</td>
</tr>
<tr>
<td>Hotel Booking Form</td>
<td>Centre Pages</td>
</tr>
<tr>
<td>Workshops &amp; Short Courses</td>
<td>70</td>
</tr>
<tr>
<td>Exhibitor Workshops &amp; Seminars</td>
<td>95</td>
</tr>
<tr>
<td>Conference Sessions Matrix Pages</td>
<td>97</td>
</tr>
<tr>
<td>PARIS EXPO PORTE DE VERSAILLES Floor Plan</td>
<td>104</td>
</tr>
<tr>
<td>Exhibitor List</td>
<td>Back Cover</td>
</tr>
</tbody>
</table>

*European Microwave Week Future Events*

**EuMW 2020 - Utrecht**

**EuMW 2021 - London**

Details in this booklet were correct at the time of going to press. They are subject to change. For up-to-date information visit our website: www.eumweek.com
Welcome to the 22nd European Microwave Week

Welcome to France where the Declaration of the Rights of Man and the Citizen was written in 1789 and Welcome to Paris “La Ville Lumière”! It is our great pleasure to welcome you to the 22nd European Microwave Week (EuMW) to be held at the Paris expo Porte de Versailles, Paris, from Sunday 29th September 2019 to Friday 4th October 2019.

“Universality through microwave” is our moto to express how the microwave technologies are fundamental for all human beings who will have to face the challenge of integrating artificial intelligence into their modern way of communicating.

The European Microwave Week was initiated by the European Microwave Association (EuMA) in 1998. EuMW 2019 continues the series of successful microwave events held in Amsterdam, London, Munich, Milan, Manchester, Nuremberg, Paris, and Madrid. The week comprises:

- the 49th European Microwave Conference (EuMC) to be held from 1st to 3rd October 2019,
- the 14th European Microwave Integrated Circuits Conference (EuMIC) which will take place from 29th September to 2nd October, and
- the 16th European Radar Conference (EuRAD) which will run from 2nd to 4th October.

Thanks to the excellent work of the 434 reviewers, the 110 members of the Technical Program Committee were able to prepare 78 technical regular sessions representing 391 presentations. The programme is complemented by 24 Workshops and 5 Short Courses covering the most relevant topics ranging from Antenna Booster Technology for IoT Applications to Multibeam Antennas, from Power Amplifiers to Automotive Radar, and from Modern Advances in Computational Imaging at Microwave and Millimetre-Wave Frequencies to High Data Rate Communications. Two other Special Sessions highlight the research activities in Latin America and in the Asia Pacific Region.

This year’s programme will boost and intensify the interaction between industry and academia thanks to 32 keynote presentations by internationally recognized industrial experts who will open selected sessions with presentations on challenges and state-of-the-art achievements in their field.

Internationally renowned speakers will discuss the latest trends and developments in their keynotes at the conferences Plenary Sessions. At the Opening Session of the EuMW, special talks will be dedicated to technical « souvenirs » of 50 years of EuMC from London in 1969 to this year’s edition. Then, Paolo Di Prisco, Wireless Transport Product Strategy leader from NOKIA in Italy will give a presentation on “Beyond 100GHz transport technology and applications”. The EuMIC opens with presentations by Prof. Dietmar Kissinger, from Ulm university, Germany, outlining the use of “BiCMOS Integrated Millimeter-Wave Circuits for Short-Range Wireless Communications and Sensing” and by Yves Mancuso, Distinguished Engineer in Thales Defence Mission Systems, France, on “Trends in Active Antennas and T/R Modules for Radar and Multi-Function Systems”. Natafaa Ayllon, Head of the RF Equipment and Technologies Section at ESA-ESTEC, The Netherlands, has accepted the invitation to close the EuMIC with a presentation on the “Trends in microwave technologies for space applications”. During the EuRAD Opening, which is held in conjunction with the DSS Forum, Florent Jangal, Radar Architect from the French Defence Procurement Agency (Direction Générale de l’Armement) will present some research and development activities supported by the Defence Innovation Agency; Then, Thomas Carpentyer, Ground MFR Product Line Manager, from Thales Land & Air System, France, will present the new SF500 radar for the next generation of FTI frigates for the French Navy. Dominic Walker, Chief Executive Officer at Aveliant Ltd, Great Britain, will describe the latest advances in Holographic Radar at the EuRAD Closing Session. The EuMW will close with a presentation about the “Soil Moisture and Ocean Salinity: A Microwave Instrument in Space” by François Deborgies, RF Technology Advisor at ESA-ESTEC, The Netherlands.

A selection of workshops and short courses presented by internationally recognized lecturers will be offered in addition to the three conferences. Moreover, the Defence, Security and Space (DSS) Forum continues to be a major event. This year the Forum will focus on New Radio Architectures and their Evolution for Satellite Constellations. The DSS Forum organizers have succeeded in attracting high-level speakers to discuss the need of new radio architectures using less power and having lower latency while still being low cost. Keynote speakers will consider the state of the art of leading technologies and systems for satellite constellations, the estimated evolution of technologies and trends and consider expected functionalities to address future challenges.

For the first time, a new automotive forum is organized to provide an open platform for industrial experts to discuss technical aspects and market issues in the area of microwaves in automotive industry. The forum will focus on hot topics such as system architectures for advanced radar, advanced methods for radar interference suppression, artificial intelligence in radar signal processing and Radar-based generation of digital maps.

Several events will occur in parallel with the conference sessions. The traditional Women in Microwave Engineering (WiM) event, co-sponsored by the IEEE MTT-Society, will focus on the topic of Instrumentation and Metrology, and both women and men are welcome. Attendees will have the chance to follow in the footsteps of inventors of progress and explore a one-of-a-kind repository of scientific knowledge visiting the “Musée des Arts et Métiers – CNAM”. For the third time, the WiM attendees will have the opportunity to interact with high school students who are invited to participate in this event. Early registration is encouraged, since the number of participants is limited.

For the younger generation, the EuMW 2019 will propose a very stimulating Student Challenge, competed on place, expected as successful as in previous years. Another event, the Student Design Competition will comprise 3 thrusts (PAs and filters) to be prepared in advance. Prototypes will be measured in front of an industrial panel. Two Schools dedicated to Software Defined Radio, with hands-on activities, will be proposed with a full-day high level lectures for master students and a half-day on the latest research topics for PhDs. The Career Platform, finally, will continue to offer students opportunities for speed dating with industrial recruiters.

Another important event of EuMW is the European Microwave Exhibition, the largest traditional microwave and RF trade show in Europe. EuMW 2019 will see an estimated 5,000 visitors, with 1,700 – 2,000 conference delegates and in excess of 300 international exhibitors.

We will offer several social events such as Monday’s EuMIC Get-Together, Tuesday’s Welcome Reception sponsored by Keysight Technologies, and the EuRAD lunch on Friday.

Enjoy Paris, the City of Lights, its rich and attractive cultural scene with shows and activities, festivals, expositions, new gallery openings, performing arts, art shops and its emblematic museums Le Louvre, Le Musée Rodin and more.

Denis Barataud
General Chair

Christian Person
General Co-Chair
Promoting European Microwaves

Archiving through the Knowledge Centre
Records papers written by the best international scientists in our secure database.
- 20,000 papers
- Download as many as you wish at no extra cost

Editing the International Journal of Microwave and Wireless Technologies
The Journal solicits original and review papers.
- Impact factor
- Free e-access
- 10 issues / year

Organising the European Microwave Week
Europe's Premier Microwave, RF, Wireless and Radar Event. Conferences are set to be cutting edge and groundbreaking.
- Future events
  2020 - Utrecht
  2021 - London
  2022 - Milan
  2023 - Berlin

20,000 papers
Download as many as you wish at no extra cost

EuMA, the European Microwave Association® is an international non-profit organisation with a scientific, educational and technical purpose, under Belgian law.

For more information and contact, visit: www.eumwa.org

Join the EuMA Community
On behalf of the European Microwave Association (EuMA), I warmly welcome you to the 22nd edition of the European Microwave Week in Paris! EuMA stands up for our microwave and RF community. We promote our microwave discipline wherever we can. We foster networking between scientists, engineers, decision makers and end-users. We pursue this in various ways but our main asset and key event to do so is the European Microwave Week (EuMW).

Most of you are familiar with EuMA, but for those who aren’t yet: We offer a membership to all working in the field of microwaves. Our General Assembly, the highest governing body of the Association, gathers representatives from European countries, from North America, from the Asia-Pacific region, and from North Africa and Middle East. If you are not a EuMA member yet, I encourage you to join. Among other benefits, you will enjoy reduced fees for attending the Week and other EuMA-sponsored conferences and workshops as well as the IEEE International Microwave Symposium. Moreover, you will have access to the internal part of our website, which provides an archive of publications, the on-line version of the International Journal on Microwave and Wireless Technologies and further networking opportunities.

The European Microwave Week (EuMW) is the premier microwave conference and exhibition event in Europe. Its centrepiece is the European Microwave Conference (EuMC), the largest of the 3 conferences composing the Week. It is complemented by the European Microwave Integrated Circuits Conference (EuMIC) focusing on semiconductor device and circuit technologies, and the European Radar Conference (EuRAD), targeting the field of radar, from components to applications. The success of EuMW is also a result of the collaboration with the IEEE MTT Society (technical co-sponsor of the Week) and the GAAS Association (co-sponsor of EuMIC). But the Week is not only conferences, the Exhibition organised by our long-standing partner Horizon House / Microwave Journal forms an integral part of it.

As everybody knows, preparing and hosting the EuMW is a major effort, from paper submission and review to on-site organisation at the venue, and this is accomplished by a team of volunteers year by year. Therefore, my special and sincere thanks go to Denis BARATAUD and Christian PERSON 2019 General Chair and Vice-chair; to Nathalie DELTIMPLE, General TPC Chair; to Cédric QUENDO, Rozenn ALLANIC and Fabien NDAGIJIMANA Workshops and Short Courses Chair and Co-chairs; to Serge VERDEYME Treasurer; as well as to Stéphane BILA and Anthony GHIOTTO, EuMC Chair and TPC Chair, to Farid MEDJDOUB and Jean-Christophe NALLATAMBY, EuMIC Chair and TPC Chair; and to Philippe EUDELINE and Jean-Yves DAUVIGNAC, EuRAD Chair and TPC Chair - just to name a few on behalf of the entire team. Thank you!

The European Microwave Week is back again in Paris after the successful events in 2015, 2010, 2005 and in 2000. All members of the team have been working hard to set up an outstanding technical and scientific programme for you and I am sure they will make your stay in Paris exciting, enjoyable, and a rewarding experience of French hospitality.

I would like to cordially invite you to EuMW 2019. Come to the wonderful city of Paris. Join us at EuMW2019 and discover information you won’t get anywhere else. Take the opportunity to meet and talk to colleagues and friends from all over the world you don’t see every day. I hope to see you in Paris! And most of all: Get involved in our community!

Welcome from the President of the European Microwave Association

Frank van den Bogaart
President
European Microwave Association
We are extremely pleased to welcome you in Paris for this new edition of the European Microwave Conference. This year is very special since we are celebrating 50 years of this flagship event of the European Microwave Week.

It is therefore a great honor for us to welcome delegates from around the world for the main annual European forum, which will allow the best researchers in the field of microwave, millimeter wave, and terahertz systems and technologies, to present the state of the art and future trends. These topics related to high frequencies, from materials and technologies to circuits, systems and applications, will be addressed in all their aspects: theory, simulation, design and measurement. EuMC will also share several sessions with EuMIC, in the field of active devices, circuits and subsystems (low noise circuits and modules, tuning and reconfigurable circuits and systems, efficiency enhancement and linearization for power amplifiers, microwave photonic components, circuits and systems...) and with EuRAD, in the areas of millimeter waves, THz technologies and systems, antennas and propagation (millimeter-wave, THz technologies and systems, antenna design and characterization, passive and active phased arrays, Tx / Rx module technologies...).

The EuMC opening session will take place on Tuesday 1st October at 10:50 and the closing session on Thursday 3rd October at 13:50. These sessions will be common to EuMC and EuMW and will be presented during the welcome address of the EuMW General Chair. They will include presentations by distinguished speakers and award ceremonies, for the EuMC Microwave Award and the EuMC Young Engineer Awards.

EuMC TPC received 469 submissions; and 54% of these contributions were selected to build a dense and high-quality conference program consisting of workshops, short courses to be held on Sunday, Monday and Wednesday, as well as special sessions that will be held in parallel with ordinary sessions from Tuesday to Thursday.

Special oral sessions will be held to highlight invited speakers from two EuMC sister conferences: the Asia-Pacific Microwave Conference (APMC) and the Latin-America Microwave Conference (LAMC).

Each of the 37 ordinary oral sessions will allow five speakers to present their most recent results. During these sessions, 22 Industrial Keynotes (including 8 shared with EuMIC and EuRAD) will allow industry leaders to expose market needs and trends.

Interactive forums will be organized on Tuesday, Wednesday and Thursday in the exhibition area, allowing participants to listen, discuss and exchange ideas.

The exhibition will run parallel to the conference, providing us with the opportunity to acquire updated information from companies active in our fields of interest.

We hope you will enjoy the conference.
Welcome to the 14th European Microwave Integrated Circuits Conference, EuMIC 2019

It is a great pleasure for us to welcome you to Paris, France, for the 14th European Microwave Integrated Circuits (EuMIC 2019) Conference that will be held on Monday 30th September and 1st October 2019. The EuMIC conference has been jointly organised by the GAAS® Association and EuMA since 2006. The city of Paris is proud to receive the visit of the Passionate European Microwave Community.

This conference is the result of huge efforts made by the panel of reviewers and TPC members. We would like to thank all of them. We also want to thank all authors, workshop and short-course organisers for their submissions and proposals, which has allowed to guarantee that this event will have great interest and high quality levels. We would especially like to acknowledge the extremely generous help received from previous EuMIC teams.

The aim of the conference is to promote the discussion of recent developments and trends, and to encourage the exchange of scientific and technical information covering a broad range of high-frequency related topics, from materials and technologies to integrated circuits and applications, that will be addressed in all of their aspects: theory, simulation, design and measurement.

The scientific panel is composed of 10 regular EuMIC sessions and 2 EuMC/EuMIC joint sessions covering topics from device to system level. Our intention is to stimulate the scientific discussion among experts from competing and complementary semiconductor technologies addressing the microwave to Terahertz frequency regimes, encompassing all aspects from device technologies, modelling and characterization, to the application oriented design of integrated circuits. The interactive poster session has been organised jointly with the EuMC and will be held on Tuesday, enjoying the lively atmosphere of the Exhibition. Several high quality and topical workshops complement the EuMIC technical sessions and you are strongly encouraged to register for those of interest to you. Finally, it is worth mentioning that EuMIC has included 5 relevant Industrial Keynotes thanks to the kind participation of prominent speakers from OMMIC, TTI Norte, EpiGaN and ENKIRIS. Invited manufacturers will take the floor during the traditional ‘Foundry Session’ hosted by the GAAs® Association.

The EuMIC Opening and Closing plenary sessions will feature three invited speakers, world-class in their fields. During the Opening ceremony Prof. Dr.-Ing. habil. Dietmar Kissinger, Institute of Electronic Devices and Circuits, Ulm University, Germany will present on BiCMOS Integrated Millimeter-Wave Circuits for Short-Range Wireless Communications and Sensing. In addition, Yves Mancuso, Distinguished Engineer in Thales Defence Mission Systems (TDMS), Microwave and AESA Technologies Design Authority, Elancourt Paris, will address the Trends in Active Antennas and T/R Modules for Radar and Multi-Function Systems. During the Closing session Natanael Ayllon, Head of the RF Equipment and Technologies Section at European Space Agency, ESTEC, The Netherlands, will talk about the Trends in microwave technologies for space applications.

Also during the Closing ceremony, the best contributed paper to EuMIC 2019 and the Young Engineer Prize will be awarded by the EuMIC Technical Program Committee and the EuMW Steering Committee. Three GAAS® Association PhD student fellowships will also be celebrated.

The members of the Organising Committee of this EuMIC 2019 have done our utmost to make this event possible. EuMIC 2019 is from now on mostly in your hands and we hope you will enjoy days of fruitful discussion, knowledge exchange and networking. We are looking forward to welcoming you in Paris.

WELCOME MESSAGES

Farid MEDJDOUB
EuMIC 2019 Chair
University of Lille – IEMN – France

Hervé BLANCK
EuMIC Co-chair
UMS-GmbH, Ulm - Germany

Jean-Christophe NALLATAMBY
EuMIC TPC Chair
University of Limoges, CNRS, XLIM – France

Joaquin PORTILLA
EuMIC TPC Co-Chair
University of the Basque Country - Spain
Welcome to the 16th European Radar Conference, EuRAD 2019

It is a pleasure for me, on behalf of the EURAD 2019 organisation team, to welcome you, in Europe, to this important event for Radar professionals, scientists, researchers and students. The European Radar Conference reaches this year its 16th edition, demonstrating the importance of such event to share state of the art on numerous topics with the Radar community and being a key element within the European Microwave Week.

This year we are proud to host the EuRAD in Paris, at Porte de Versailles, from 2nd to 4th October. During these days, top professionals will present their latest research and development, and discuss about the present status and future trends in the fields of radar technology, system design and performance, radar components, radar propagation and target modelling, advanced signal processing techniques, as well as the most innovative radar architectures, concepts and applications.

On Wednesday October 2nd, in the opening session, we will enjoy the presence of two keynote Speakers, one from the French defence procurement agency (DGA) and the second one from Thales. The first speaker, Florent Jangal from the French MoD, will present the actual and future visions about electromagnetic detection and electronic warfare challenges. Then the second speaker, Mr Thomas Carpentier from Thales Land & Air System, France, will present the new SF500 radar for the next generation of FTI frigates for the French Navy, in which advanced concepts are included. For the closing session our keynote speaker, Mr Dominic Walker from Aveillant, Great Britain, will describe the latest advances in Holographic Radar.

This year, 145 papers were submitted to the conference, and after a rigorous selection process, 83 papers have been accepted and were organised into almost 17 oral sessions and two interactive sessions, some of them shared with EuMC. Prominent industrial keynotes speakers will open seven of these sessions, showing the latest industry approaches to the addressed technologies. A new event is organized in EuMW2019 about automotive subjects and will be held on 30th of September. The objectives of this automotive forum are to discuss technical aspects and market issues in the area of microwaves in automotive industry. Many points will be discussed through 20-minute presentations, as system architectures for advanced radar systems, radar interference suppression, artificial intelligence in radar signal processing, fusion or radar and camera, radar-based generation of digital maps.

An attractive topical workshops program will be running alongside the conference programme, some of them shared with EuMC. Three workshops will be focused on radar topics with one on advanced passive radar techniques and applications, the second one will deal with the new radar concepts and processing for autonomous driving while the third one will address news concepts in integrated circuits and transceiver frontends for mm Wave automotive radar. We should have also two workshops with wider topics as the interference risk between high frequency GHz radar devices or the test procedures and validation sensor functions for automotive radar and autonomous driving. One short course will address the modern advances in computational imaging.

Finally, we would like to express our gratitude to all the reviewers and the TPC members for undertaking their task in a professional and timely manner, and for their contribution to the success of the conference. We look forward to meeting you in our nice city, at the EuRAD 2019 conference, and wish you a very pleasant stay in Paris.
Welcome from the General TPC Chair

This year the European Microwave Week is held in Paris and we are thrilled about this excellent opportunity for the microwave community to meet, share advances and interact. As General Technical Programme Committee Chair, I am grateful for the excellent scientific revision and management of the submitted manuscripts by the reviewers and TPC members, meeting all the required deadlines. The total number of contributions submitted was 737. The reviews were performed by 109 TPC members and more than 434 reviewers, listed in the programme book. The TPC meeting was held in April 6th in Bordeaux, where an intense scientific activity took place in a friendly atmosphere. The TPC members and reviewers are fundamental to preserve the high scientific standards of the EuMW and I strongly recognize their dedication, which guarantees a thorough and fair decision, typically based on six reviews per paper. Eventually, a total of 391 regular papers were accepted (297 oral papers and 94 posters), arranged in 74 oral sessions (including special, opening and closing) and 6 interactive sessions. In addition to the regular papers, and following an initiative started in the past EuMW, there are 32 invited industrial keynotes, which will open some of the technical sessions of the three conferences.

It has been a unique opportunity to chair the TPC, both scientifically and personally. Going through all the submitted papers for the initial review setup, we have been able to appreciate the high global quality of the contributions and the significant advances in the broad diversity of topics covered by EuMW. At a personal level, I have had the pleasure to fruitfully interact with TPC members and reviewers for an optimum execution of the revision procedure. I am grateful to the previous TPC chairs and EuMW teams for their precious help and availability, especially to Prof. Almuneda Suarez and Juan-Mari Collantes for their timely answers to numerous questions and the valuable documents they provided us. I would also like to acknowledge Prof. Lorentz-Peter Schmidt for organising and chairing the hand-over meetings, as well as the members of the EuMA BoD for their useful comments and suggestions.

The TPC has been managed with the CONVERIA software. I want to thank Marc van Heijningen, Cristina Andrei, Matthias Rudolph and the staff from CONVERIA, who have actively supported us during the whole review process and TPC meeting. Their help has been invaluable. I am also very grateful to the three conference TPC Chairs and co-Chairs, the Chairs of the Workshops and Short courses, the Chairs of the Special and Focus Sessions, and the whole EuMW 2019 team who have been extremely responsive during the whole process.

I wholeheartedly hope that you will enjoy the technical programme of EuMW 2019 and the lively city of Paris, with its renowned museums and historic neighborhoods and landmarks.

My warmest welcome to EuMW 2019 in Paris, France!

Dr. Nathalie DELTIMPLE
EuMW General TPC Chairwoman
Bordeaux INP – IMS – France

SPECIAL ISSUE

International Journal of Microwave and Wireless Technologies: EuMW 2019 Special Issue

The International Journal of Microwave and Wireless Technologies was created in 2009 by the European Microwave Association (EuMA) and Cambridge University Press for the benefit of the microwave research community in Europe and overseas. The journal is published eight times a year. It allows academic and industrial researchers to promote their work and stay connected with the most recent developments in microwave and RF technology. The journal is referenced in databases such as Scopus and Google Scholar and is indexed in the Thomson Reuters Web of Science. Following the success of previous microwave weeks, the journal will again publish a special issue dedicated to European Microwave Week 2019.

The authors of several highly ranked papers presented at the conferences will be invited to submit an extended version for publication in the journal. The special issue will be guest edited by Anthony Ghiotto, TPC chair of EuMC 2019, Jean-Christophe Nallatamby, TPC chair of EuMIC 2019, and Jean-Yves Dauvignac, TPC chair of EuRAD 2019.

Accepted papers will be published online at http://journals.cambridge.org/MRF and can be referenced using their DOI (Digital Object Identifier). Once all submissions are received, the articles will be collated into the Special Issue and published in print, which is expected to appear in June 2020.

Anthony Ghiotto and Alexandru Takacs - EuMC 2019 TPC Chair and Co-Chair
Jean-Christophe Nallatamby and Joaquin Portilla - EuMIC 2019 TPC Chair and Co-Chair
Jean-Yves Dauvignac and Stéphane Méric - EuRAD 2019 TPC Chair and Co-Chair
2018 European Microwave Week in Madrid
Best Paper Prizes

EuMC Microwave Prize (sponsored by Val Space Consortium and European Space Agency)
A 5.8 GHz 64-Channel Phased Array Microwave Power Transmission System Based on Space-Time Beamforming Algorithm for Multiple IoT Sensors
Kentaro Murata, Toshiya Mitomo, Makoto Higaki, Kohei Onizuka. Toshiba Corporation Japan

EuMC Young Engineer Prizes (sponsored by Universidad Carlos III de Madrid)
Near-Field Beam Focusing and Steering Generator Based on 3D Curved Substrate Integrated Waveguide
Ya Fei Wu, Prof. Yu Jian Cheng University of Electronic Science and Technology of China
Frequency Selective Ferrite Circulators with Quasi-Elliptic Transmission Response
Andrea Ashley, Laila Marzall; Prof. Zoya Popovic; Prof. Dimitra Psychogiou University of Colorado, Boulder, USA

EuRAD Best Paper Prize (sponsored by Thales Netherlands)
IQ Imbalance Robust OFDM Radar Waveform
Prof. André Bourdoux; Dr. Marc Bauduin; Dr. Claude Desset IMEC, Belgium

EuRAD Young Engineer Prize (sponsored by Hensoldt Sensors GmbH)
Expanding the Unambiguous Velocity Limitation of the Stepped-Carrier OFDM Radar Scheme
Benedikt Schweizer, Daniel Schindler; Christina Knill; Dr. Jürgen Hasch; Prof. Christian Waldschmidt University of Ulm, Germany

EuMIC Best Paper Prize
A 112 µW F-band Standing Wave Detector in 40nm CMOS for Sensing and Impedance Detection
Bart Philippe, Patrick Reynaert, KU Leuven, Belgium

EuMIC Young Engineer Prize
Design of an S-Band Chireix Outphasing Power Amplifier Based on a Systematic Bandwidth Limitation Analysis
Anna Piacibello, Dr. Roberto Quaglia; Prof. Marco Pirola; Prof. Steve Cripps Politecnico de Torino, Italy
### 2019 EuMA Outstanding Career Award

In 1977, Alain Cappy joined the Semiconductor and Microwave Centre, former name of the Institute of Electronics, Microelectronics and Nanotechnology (IEMN), a joined research unit between CNRS and the University of Lille. He received the PhD and the ‘Docteur es Sciences’ degrees from the University of Lille, in 1981 and 1986 respectively. He is now Professor Emeritus of Electronics an Electrical Engineering.

For more than 30 years, his research interests were concerned with the modelling, fabrication and characterisation of low noise Field effect transistors based on III-V materials. He was an actor of the amazing FET revolution that began in the early 1980s with the development of AlGaAs/GaAs heterostructures showing high mobility 2D electron gas. Afterwards, he was involved in the modelling, design and fabrication of strained layer PM-HEMT, InP HEMT, InAs-AlSb-HEMT and even THz-HEMT based on plasma oscillations. He is the author or co-author of about 200 scientific papers and communications and he gave 25 invited papers in international conferences and workshops. He was the supervisor of 25 PhD students and he participated in more than 140 PhD thesis and ‘Habilitation’ committees.

Since 2010, he completely change his research field to work on artificial neurons and neuro-inspired circuits for information processing and medical applications.

In parallel with this scientific activity, he has worked from 2002 to 2010 as the director of IEMN, a research institute that gathers more than 250 scientists and 160 PhD students. From 2010 to 2014 he was appointed as the director of IRCICA, a laboratory specifically created by CNRS and the University of Lille to promote interdisciplinary research. From 2009 to 2017, he joined the national agency for evaluation of research and higher education (Hêres) where he was the coordinator for the evaluation of the research laboratories of the Science and Technology domain.

### 2019 EuMA Distinguished Service Award

Wolfgang Heinrich received the Dipl.-Ing., Dr.-Ing. and habilitation degrees in 1982, 1987, and 1992, respectively, all from the Technical University of Darmstadt, Germany. In 1993, he joined the Ferdinand-Braun-Institut (FBH) at Berlin, Germany, where he has been head of the microwave department and deputy director of the institute. Since 2008, he has been also professor with the Technical University of Berlin, where he holds the chair of High-frequency Technologies.

The subject of his PhD dealt with distributed effects in GaAs MESFETs. He then worked on planar transmission lines, pioneering models for coplanar circuits. At FBH, he broadened the scope of his research to III-V MMICs in general. His present activities focus on GaN power amplifiers, mm-wave integrated circuits and their packaging, and electromagnetic simulation.

Wolfgang Heinrich has authored or co-authored more than 350 publications and conference contributions. He is member of the editorial board of the leading scientific journals in his field and has been serving on the Technical Program Committee of the European Microwave Conference and the International Microwave Symposium for many years. Also, he acted as reviewer in European projects and in advisory functions. He is a Fellow of the IEEE.

He has been serving the microwave community in various functions, e.g., as chairman of the German IEEE MTT/AP Chapter from 2002 to 2007, as IEEE MTT-S Distinguished Microwave Lecturer for the term 2003-2005, as chair of the MTT-12 Committee on interconnects, packaging, and manufacturing from 2006 through 2008, and as Associate Editor of the IEEE Transactions on MTT from 2008 until 2010. In 2007, he was General Chair of the European Microwave Week in Munich, Germany.

Wolfgang Heinrich was elected to the EuMA Board of Directors in 2009. He became President of the European Microwave Association on Jan 1, 2010, and served for 3 terms until the end of 2018.
EuMA AND EuMW COMMITTEES

EuMA
General Assembly 2019

Board of Directors
Frank van den Bogaart
Gilles Dambrine
Patrice Gamand
Andrew Gibson
Willem Hol
Renato Lombardi
Luca Perregrini
Almudena Suárez Rodríguez
Danielle Vanhoenacker-Janvier
Thomas Zwick

EuMW Chairs
Magdalena Salazar-Palma EuMW 2018
Denis Barataud EuMW 2019
Frank van Vliet EuMW 2020

Ordinary Members
Serge Verderyme, Group 1
Ingmar Kalffass, Group 2
Luciano Tarricone, Group 3
Chong Li, Group 4
Wim Van Capellen, Group 5
Christian Fager, Group 6
Vitaliy Zhurbenko, Group 7
Gabriel Banciu, Group 8
Bartlomiej Salski, Group 9
Kateryna Arkhypova, Group 10
Constantinos Angelis, Group 11
Oleg V. Stukach, Group 12
Jasmin Grosinger, Group 13
Juan Mari Collantes, Group 14
Ke Wu, Group 15
Ichihiko Toyoda, Group 16
Amr Safwat, Group 17
Oksana Shramkova, IEEE Reg 8

Founder Members
Leo Ligthart
Asher Madjar
Holger Meinel
Steve Nightengale
Roberto Sorrentino
André Vander Vorst

EuMA International Journal Editor
Fransisco Medina-Mena

Honorary Secretary
Andrew F. Wilson

Countries Represented
Group 1 - France, Monaco
Group 2 - Germany
Group 3 - Italy, San Marino, Vatican City
Group 4 - United Kingdom, Ireland, Gibraltar, Malta
Group 5 - Belgium, The Netherlands, Luxembourg
Group 6 - Iceland, Norway, Sweden
Group 7 - Denmark, Faroe Islands, Finland, Greenland
Group 8 - Bulgaria, Czech Republic, Hungary, Romania, Slovakia
Group 9 - Estonia, Latvia, Lithuania, Poland
Group 10 - Armenia, Azerbaijan, Georgia, Moldova, Ukraine
Group 11 - Albania, Bosnia and Herzegovina, Croatia, Cyprus, FYR Macedonia, Montenegro, Greece, Israel, Serbia, Slovenia, Turkey
Group 12 - Belarus, Russia
Group 13 - Austria, Liechtenstein, Switzerland
Group 14 - Andorra, Portugal, Spain
Group 15 - North America
Group 16 - Asia-Pacific
Group 17 - Africa and Middle East countries

EuMW Steering Committee 2019

EuMA Board of Directors
EuMW Officer
Lorenz-Peter Schmidt, EuMW Officer

GAAS Representative
Paolo Colantonio, GAAS (2017 - 2019)

EuMW Chairs
Magdalena Salazar-Palma, EuMW 2018
Denis Barataud, EuMW 2019
Frank van Vliet, EuMW 2020
Nick Ridler, EuMW 2021
Luca Perregrini, EuMW 2022

MTT-S Observer
Jozef Modelsiki

APMC Delegate 2018-2020
Kamran Ghorbani

Conference Software Officers
Marc van Heijningen
Matthias Rudolph
Christina Andrei

2019 Conference Chairs, TPC Chair and Treasurer
Nathalie Deltimple, TPC Chair
Stéphane Bila, EuMC
Farid Madjoub, EuMIC
Philippe Eudeline, EuRAD
Serge Verderyme, Treasurer

2020 Conference Chairs, TPC Chair and Treasurer
Alex Yarovoy, TPC Chair
Wim van Cappellen, EuMC
François Deborgies, EuMIC
Mayazzurra Ruggiano, EuRAD
Ioan E Lager, Treasurer

EuMW Operational Officers 2018-2021
Manuel Sierra Castañer, 2018 Oper. Officer
Bernard Jarry, 2019 Oper. Officer
Marcel van der Graaf, 2020 Oper. Officer
Xiaobang Shang 2021, Oper. Officer

HH Representatives
Ivar Bazzy, President
Michel Zoghob, Event Director

By Invitation
Wolfgang Heinrich, Past President
Roberto Sorrentino, International Officer
André Vander Vorst, Secretary Emeritus/DPO
Andrew F. Wilson, Hon. Secretary
Annemie Van Nieuwerburgh, HQ Assistant

www.eumweek.com

14 | www.eumweek.com
EuMA AND EuMW COMMITTEES

EuMC Technical Programme Committee

Jose Ignacio Alonso
Arokiaswami Alphones
Herve Aubert
Shmuel Auster
Denis Barataud
César Barquinero
Simone Bastioli
Olof Bengtsson
Stéphane Bila
Pierre Blondy
Vicente Borja
Maurizio Bozzi
Chi Hou Chan
Juan-Mari Collantes
Alessandra Costanzo
Nathalie Deltimple
Alessandro Galli
Patrice Gamand
Peter Gardner
Anthony Ghiotto
Kamran Ghorbani
Rafael-Valdivia Guillermo
Wolfgang Heinrich
Mehter Karaaslan
Mehter Kaynak
Justin King
Alexander Kölpin
Ioan Lager
Hervé Leblond
Giuseppe Macchiarella
Jan Machac
Asher Madjar
Ferran Martin
Petronilo Martin Iglesias
Diego Masotti
Marion Matters-Kammerer
Francisco Medina
Jerzy Michalski

Jozef Modelska
Andrei Muller
José Carlos Pedro
Christian Person
Cédric Quendo
Antti Raisanan
Nick Ridler
Hendrik Rogier
Ilona Rolfses
Magdalena Salazar Palma
Kamal Samanta
Dominique Schreurs
Patrick Schuh
Richard Snyder
Almuna Suarez Rodriguez
Alexandru Takacs
Luciano Tarricone
Cristiano, Tomassoni
Wim Van Cappellen
Serge Verdeyme
Ville Viikari
Jan Vrba
Ke Wu
Peter Zwamborn
Thomas Zwick

EuMC Technical Programme Committee

Khanna Amarapal
Eric Bergeault
Georg Boeck
Nuno Borges Carvalho
Paolo Colantonio
Massimo Comparini
Gilles Dambrine
Luisa de la Fuente
Francois Deborgies
Didier Floriot
Christophe Gaquier
Giovanni Ghione

Franco Giannini
Ingmar Kalffass
Eric Kerhervé
Dietmar Kissinger
Domine Leenaerts
Teresa M. Martin-Guerrero
Farid Medjdoub
Joaquin Portilla
Michael Schlechtweg
Patrick Schuh
Ho-Jin Song
Frank Van den Bogaart
Frank van Vliet
Herbert Zirath

EuRAD Technical Programme Committee

Mateo Burgos Garcia
Carlos Castillo
Kevin Cinglant
Jacco de Wit
Philippe Eudeline
Alfonso Farina
Reinhard Feger
Laurent Ferro-Famil
Yang Hao
Stephen Harman
Willem A. Hol
Krzysztof Kulpa
Claire Migliaccio
Debora Pastina
Mayazzurra Ruggiano
Christian Sturm
Christian Waldschmidt
Felix Yanovsky
Alexander Yarovoy
Naruto Yonemoto
Volker Ziegler

2019 Technical Programme Committee

Image courtesy of Shmuel Auster

www.eumweek.com | 15
EuMW 2019 REVIEWERS

Ackerman Edward
Aikio Janne P.
Aja Beatriz
Akkul Mustafa
Albasha Lutfi
Allanic Rozenn
Alonso José Ignacio
Alphones Arökiaswami
Ammendola Giandomenico
Andersson Ann-Marie
Andrei Cristina
Andriychuk Mykhaylo
Angelov Iltcho
Arndt Fritz
Arthaber Holger
Aubert Hervé
Auster Shmuel
Ayllon Natanael
Baer Christoph
Baillargeat Dominique
Bajon Damienne
Bakri-Kassem Maher
Balsam Andre
Bartolic Juraj
Barton Taylor
Baxandall Boris
Begueret Jean-Baptiste
Belot Didier
Bengtsson Olof
Berceli Tibor
Bergeault Eric
Berroth Manfred
Bessemoulin Alexandre
Bij de Vaate Jan Geralt
Bila Stéphane
Bloecher Hans-Ludwig
Bourjoul Marie-Noëlle
Bocca Luigi
Boeck Georg
Bonani Fabrizio
Borges Carvalho Nuno
Boria Vicente Enrique
Bouysse Philippe
Bozzi Maurizio
Brousseau Christian
Brüggenwirth Stefan
Burgos-Garcia Mateo
Cabral Pedro
Camarchia Vittorio
Camiate Marc
Campovecchio Michel
Cano Juan Luis
Capria Amerigo
Carlowitz Christian
Carta Corrado
Castillo Carlos
Catarinucci Luca
Cazarin Kevin
Chakma Guy-Aymar
Chan Chi Hou
Cherpak Nickoloy
Chiao J-C
Choudhury Debabani
Cinglant Kevin
Cipriani Elisa
Colantonio Paolo
Colella Riccardo
Collantes Juan-Mari
Collins Gayle
Comparini Massimo
Costanzo Alessandra
Crespo-Cadenas Carlos
Cristallini Diego
Cuiñas Iñigo
Dallmann Thomas
Dambire Gilles
Damm Christian
Dankov Plamen
Danneville François
Dasgupta Amitava
Dasgupta Nandita
Dauvignac Jean-Yves
de Hek Peter
de la Fuente Luisa
de Miguel Vela Gonzalo
de Paco Pedro
de Rosny Julien
de Wit Jacco J.M.
Deann Andy
Deborgies François
Decroze Cyril
Delaveaud Christophe
Delcourt Sebastien
Delhote Nicolas
Deltimple Nathalie
Descamps Philippe
Deval Yann
Dielacher Franz
Dioniggi Marco
Dispensa Massimiliano
Djeran Tarek
Doerner Ralf
Donati Guerrieri Simona
Dragomirescu Daniela
Dreher Achim
Dubuc David
Ducournau Guillaume
Dupuy Victor
Duoc Yvan
Dzvonkovskaya Anna
Engelmann Jens
Escot-Bocanegra David
Eudeline Philippe
Fager Christian
Falcone Francisco
Farina Alfonso
Favennec Jean François
Feger Reinhard
Feiginov Michael
Fernández Barciela Mónica
Ferrero Fabien
Ferro-Famil Laurent
Filicori Fabio
Fiorini Michele
Fischer Georg
Floriot Didier
Fonseca Nelson
Fortino Nicolas
Fourn Erwan
Franco Marc
Fregonese Sebastien
Fusco Vincent
Gadringer Michael Ernst
Galati Gaspare
Galli Alessandro
Gamand Patrice
Gaquiero Christophe
Gardner Peter
Geffrin Jean-Michel
Geissler Matthias
Gerfault Bertrand
Gerfers Friedel
Ghone Giovanni
Ghiotto Anthony
Ghorbani Kamran
Giannini Franco
Gibbino Gian Piero
Gilson Andy
Gilabert Pere L.
Gillard Raphael
Giofrè Rocco
Giusti Elisa
Golio Mike
Gómez-Garcia Roberto
Gonzalez Perez Jose Manuel
Gonzalo Ramon
Goussev George
Greco Maria S.
Grenier Katia
Gresham Ian
Guglielmi Marco
Guinvarch Régis
Hajivand Mehrdad
Hamran Svein-Erik
Hao Yang
Happy Henri
Harman Stephen
Heinrich Wolfgang
Hemour Simon
Herschel Reinhold
Hesselbarth Jan
Höft Michael
Hol Willem A.
Hu Zhirun
Huitema Laure
Hun H. Alfred
Izekeik Stavros
Issakov Vadim
Itoh Tatsuo
Jacoby Arne F.
Jaeschke Timo
Jarabo-Amores María-Pilar
Jardel Olivier
Jarry Bernard
Jelonnek John
Jeuland Hervé
Kalfass Ingmar
Karaaaslan Mehmet
Karimian Noshin
Kaynak Mehmet
Kemkemian Stéphane
Kerhervé Eric
Khanum Amarpal
Kim Bumman
King Justin
Kissinger Dietmar
Klare Jens
Knott Peter
Kodera Toshio
Koelpin Alexander
Kondoh Hiroshi
Koziel Slawomir
Krasnov Oleg
Krozer Viktor
Kulpka Krzysztof
Kuznetsov Yury
Labat Nathalie
Lager Ioan
Lanteri Jérôme
Lanzieri Claudio
Lasri Tuami
Lautru David
Le Chevalier Francois
Leblanc Remy
Leblond Hervé
Lee Timothy
Leenaerts Domine
Lenk Friedrich
Leonardi Mauro
Leong Yoke Choy
Leuzi Giorgio
Limiti Ernesto
Lin Fujiang
Lindenmeier Stefan
Lintignat Julien
Welcome to EuMW 2019

European Microwave Week 2019 takes place at the heart of the ville lumiere, Paris! Bringing industry and academia together, European Microwave Week 2019 is a SIX day event, including THREE cutting edge conferences and ONE exciting trade and technology exhibition featuring leading players from across the globe. EuMW 2019 provides access to the very latest products, research and initiatives in the microwave sector. It also offers you the opportunity for face-to-face interaction with those driving the future of microwave technology.

The 22nd European Microwave Week combines:
• Three Major Conferences
• Associated Workshops
• Tailored Courses and Seminars for industrialists, academics and researchers
• Leading International Trade Show.

In addition, Exhibitor Workshops and Seminars will be provided by several top organisations with superior expertise in Microwave, RF, Wireless or Radar.

BADGES

Online registrants will automatically be e-mailed their badge barcode and an order confirmation receipt immediately after they pay. All those who have pre-registered should bring their badge barcode and confirmation with them to the conference where they can print out their badge by scanning their barcode at the Fast Track desk onsite. Once you have collected your badge, conference attendees can collect the proceedings which are on a USB stick and the delegate bag. Processing will be quick and easy but queues may form at busy times, so please arrange to collect your badge well in advance of your first conference session.

The registration area will be located in Pavilion 7, Level 3 as signposted.

Those who have not pre-registered can do so on site. There will be onsite registration terminals located within the registration area, where delegates can enter their details and pay immediately by swiping their credit or debit cards through the card readers attached to the terminals.

Alternatively, you can pay at the Cashier desk if you require a printed receipt.

If you have any questions regarding registration procedures and payment, please email: eumwreg@aventri.com.

CONFERENCES

Choose from three separate but complementary conferences. Spanning the length of the week, starting from Sunday 29th September, the conferences and workshops are scheduled as follows:

• European Microwave Integrated Circuits Conference (EuMIC) 29th September-1st October 2019
• European Microwave Conference (EuMC) 1st-3rd October 2019
• European Radar Conference (EuRAD) 2nd-4th October 2019
• Plus Workshops and Short Courses (29th September - 4th October 2019)
• In addition, EuMW 2019 will include for the 10th year, the Defence, Security and Space Forum on 2nd October 2019.
• For the first time, EuMW 2019 will propose a new Automotive Forum on 30th September 2019.

The conferences encompass a wide range of subject areas including:
• Microwave, Millimetre-wave and Submillimetre-wave Systems
• Antennas and Propagation
• Wireless Technologies
• Telecommunication (RF, Microwave and Optical)
• ICs, Semiconductor Materials and Packaging
• Radar Architectures, Systems and Subsystems
• Sensors and Remote Systems
• Test and Measurement

EuMW 2019 is a SIX day event, including THREE cutting edge conferences and ONE exciting trade and technology exhibition featuring leading players from across the globe. EuMW 2019 provides access to the very latest products, research and initiatives in the microwave sector. It also offers you the opportunity for face-to-face interaction with those driving the future of microwave technology.

Online registration opens in June 2019 and remains open up to and during the event until 4th October. During the event, you can also register onsite from Saturday 28th September 2019 (16.00 -19.00) and from 08:00 each morning from Sunday 29th September to Friday 4th October 2019.

Conference rooms are located in Pavilion 7 as signposted. The conferences will be held in different rooms over the conference dates. Please refer to the Conference Matrix at the back of this booklet for a detailed overview. Delegates can register for one, two or all three of the conferences. Registration at one conference does not allow any access to other conference sessions. Those who wish to register for two or more conferences will receive a discount on these registrations.

Fees and discounts are all explained in the Conference Registration Information section of this booklet.

PROCEEDINGS ON USB STICK

All papers published for presentation at your chosen conference will be on a USB stick given out with the delegate bags. There will be one USB stick combining all three conferences. No hard copies of workshop slides will be provided. Slides for the workshops and short courses will be provided at the conference for workshop and short courses participants.

INTERACTIVE SESSIONS

The interactive poster papers will be presented on electronic screens, which are located in the exhibition as signposted on Tuesday, Wednesday and Thursday.

SPEAKER PREPARATION SPACE

A speaker preparation area is located in Pavilion 7, Level 3 (to the left in the exhibition hall).

EXHIBITION HOURS

The exhibition area will be located in Pavilion 7, Level 3 as shown on the Floor Plan in this booklet. As a registered delegate you will have full access to the exhibition area.

The exhibition opening hours are:
• Tuesday 1st October 9.30-18.00 (followed by the Welcome Reception)
• Wednesday 2nd October 9.30-17.30
• Thursday 3rd October 9.30-16.30

See the back cover for a full listing of the exhibitors (correct at the time of going to press).
EuMA MEMBERSHIP

One can apply for EuMA membership by ticking the appropriate box during registration for EuMW. Membership is valid for 1 year, starting when the subscription is completed. The discount for the EuMW fees applies immediately.

EuMA membership fee is €25 for Professionals and €15 for Students. Members have full e-access to the International Journal of Microwave and Wireless Technologies. The printed version of the Journal is no longer available.

EuMA offers a three-year free membership for people residing in NIS and some African countries.

EU MA KNOWLEDGE CENTRE

The EuMA website has its Knowledge Centre which presently contains over 20,000 papers published under the EuMA umbrella. Full texts are available to EuMA members only, who can make as many copies as they wish, at no extra-cost.

HOTELS AND TRAVEL

HOTEL RESERVATION

Horizon House has teamed up with Connex Hotels and Events, our official hotel booking supplier, to offer you the ability to book your accommodation for EuMW at the most competitive rates available. It is very easy to make an immediate hotel booking.

Simply visit their booking page http://www.connexhotelsandevevents.com/eumw-2019-paris.html and make your booking, or email sally@connexhotelsandevevents.com. You will find a wide range of accommodation to suit every budget. Alternatively, see the hotel booking pages within this programme.

GETTING TO PARIS EXPO PORTE DE VERSAILLES

The city of Paris and it is well connected to the European motorway, rail and flight networks. Paris Expo Porte de Versailles can be accessed through a variety of transportation means.

Address:
Paris Expo Porte de Versailles - 1 Place de la Porte de Versailles
75015 Paris

BY PUBLIC TRANSPORT

Use the following public transportation to get to Paris Expo Porte de Versailles:

METRO: Line 12, Porte de Versailles station / Line 8, Balard station
TRAMWAY: Lines T2 and T3a, Porte de Versailles–Parc des Expositions stop
BUS: Line 80, Porte de Versailles–Parc des Expositions stop / Line 39, Desnouettes stop

BY AIR

From Roissy-Charles de Gaulle airport:
Take the RoissyBus to Paris–Opéra, then take Metro Line 8 (direction Balard) to Madeleine, and change to Line 12 (direction Mairie d’Issy) to Porte de Versailles–Parc des Expositions station.

Take the RER B (direction Saint-Rémy-lès-Chevreuse) to Cité Universitaire station, then take tramway T3 (direction Pont du Garigliano) to Porte de Versailles–Parc des Expositions stop.

From Orly airport:
Take the Orlyval train to Antony, then the RER B to Cité Universitaire, change to the tramway T3 and get off at the Porte de Versailles–Parc des expositions stop.

Take the Orlybus to Denfert-Rochereau, then the RER B to Cité Universitaire, change to the tramway T3 and get off at the Porte de Versailles–Parc des expositions stop.

OTHER USEFUL INFORMATION

PERSONAL INVITATION

A valid passport will be required for entry into the organising country, in this case France. Since EuMW events are held in the European Union, no visa is usually required for travellers with passports from a number of countries, like for instance: European Union, Australia, Brazil, Canada, Japan, Singapore, South Korea or the United States. If you are registering as visitor, delegate or exhibitor and you need a visa, we recommend that you speak with the French Consulate, in your own country. You should organise this at least 3 to 4 months prior to EuMW.

The organisations will be pleased to send a letter of invitation to any exhibitor, conference delegate or speaker requesting it.

For requesting this letter of invitation, please pre-fill the invitation letter at https://france-visas.gouv.fr/en_US/web/france-visas/welcome-page and send to the visa operational officer: visa-eumw2019@unilim.fr

INSURANCE

It is highly recommended that all participants carry the proper travel and health insurance, as the organiser cannot accept any liability for any accidents or injury that occur during or when travelling to the event. Please also insure that personal items are covered for loss, damage or theft either through a personal policy or by a corporate policy. We cannot accept any liability for personal items that are lost, damaged or stolen during or travelling to and from European Microwave Week 2019.

ELECTRICITY

Electricity is supplied at 230V, 50 Hz.

SOCIAL EVENTS & PARTNER PROGRAMME

Full details of the social events & dinners that are taking place during EuMW 2019 can be found in the ‘Social Events & Partner Programme’ section of this programme.

CREDIT CARDS

All major hotels and most restaurants and shops will accept credit cards. It is advisable to carry other identification as well. Visa and MasterCard are the most widely accepted cards.

WIFI

Wifi is available in the exhibition hall and conference area. Login details can be found within your delegate bag.

SHOPPING & SIGHTSEEING

A great city that boasts a rich treasure of art, culture and natural environments, set in a region packed with history and modernity. Visit https://en.parisinfo.com/ for information on top attractions and tips for your stay.

Alternatively, see the “Social Events & Partner Programme” section of this booklet for tours and excursions before, during and after EuMW 2019.

www.eumweek.com | 19
**SOCIAL EVENTS**

**EuMIC Get-Together**

**Date:** Monday 30th September 2019  
**Duration:** from 18:30 until 21:00  
**Location:** Paris expo Porte de Versailles, 1 place de la Porte de Versailles 75015 Paris  
**Cost:** Free to EuMIC delegates

Following the tradition of the European Microwave Integrated Circuits Conference, delegates are invited to enjoy an informal “finger food” buffet. An unrivalled setting to have a good time with colleagues and friends and taste the excellent French cheese and wine.

**Automotive Forum Networking Dinner**

**Date:** Monday 30th September 2019  
**Duration:** 19:30 until 22:30  
**Location:** Restaurant in Paris  
**Cost:** Free and only available to the Automotive Forum registered delegates.

**Welcome Reception**

**Date:** Tuesday 1st October 2019  
**Duration:** 18:30 until 21:30  
**Location:** Paris expo Porte de Versailles, 1 place de la Porte de Versailles 75015 Paris  
**Cost:** Free to conference delegates and invited exhibitors.

All registered conference delegates, as well as invited representatives from companies participating in the exhibition are invited to the EuMW 2019 Welcome Reception, sponsored by Keysight Technologies, Horizon House Publications and EuMA. Delegates will need to bring their badge and exhibitors their invite along with them to gain entrance. The evening will begin with drinks at 18:30 followed by the General Chairs’ handover from EuMW 2019, Paris to EuMW 2020, Utrecht as well as an address from the Platinum Sponsor, Keysight Technologies. The open-buffet dinner will be served from 19:00.

**EuRAD Lunch**

**Date:** Friday 4th September 2019  
**Duration:** 12:30 until 13:50  
**Location:** Paris expo Porte de Versailles, 1 place de la Porte de Versailles 75015 Paris  
**Cost:** Free to EuRAD delegates and Friday WS/SC delegates

**Defence, Security & Space Forum Cocktail Reception**

**Date:** Wednesday 2nd October 2019  
**Duration:** 17:50 until 18:30  
**Location:** Paris expo Porte de Versailles, 1 place de la Porte de Versailles 75015 Paris  
**Cost:** Free to Defence, Security & Space Forum registered delegates.
CONFERENCE REGISTRATION INFORMATION

Fast Track Badge Retrieval
Register online and print out your badge in seconds onsite from the Fast Track Check In Desk

Register Online at www.eumweek.com
ALL FEES ARE INCLUSIVE OF FRENCH VAT @ 20%

ONLINE registration is open from 28th May 2019 up to and during the event until 4th October 2019.
ONSITE registration is open from 16:00 on 28th September 2019.
ADVANCE DISCOUNTED RATE (up to and including 30th August) STANDARD RATE (from 31st August & Onsite).

CONFERENCE REGISTRATION FEES
There are TWO different rates available for the EuMW conferences:
• ADVANCE DISCOUNTED RATE – for all registrations made online up to and including 30th August (these are approximately 40% cheaper than the Standard Rate).
• STANDARD RATE – for all registrations made online from 31st August and onsite.

Please see the Conference Registration Rates table on the following page for complete pricing information. All payments must be in € (Euros) – cards will be debited in € (Euros).

CONFERENCE REGISTRATION DETAILS

Online Registration
• All registrations should be made online at www.eumweek.com. Those completed up to and including 30th August will be charged at the ‘Advance Discounted Rate’ and those from 31st August will be charged at the ‘Standard Rate’.
• Online registration is open from 28th May 2019 up to and during the event until 4th October 2019. You can also register ONSITE from 16:00 on Saturday 28th September 2019 and then at the times detailed below.

Onsite Registration
Onsite registration is available:
• Saturday 28th September 16:00 - 19:00
• Sunday 29th September 08:00 - 17:00
• Monday 30th September 08:00 - 17:00
• Tuesday 1st October 08:00 - 17:00
• Wednesday 2nd October 08:00 - 17:00
• Thursday 3rd October 08:00 - 17:00
• Friday 4th October 08:00 - 10:00

Onsite registration will be charged at the Standard Rates (see pricing table on the following page).

HOW TO REGISTER

Online
• All registrations should be made online at www.eumweek.com.
• Delegates can register for one, two or all three of the conferences, workshops and short courses.
• Discounts will be given to those registering for two or more conferences.
• Payment can be made online using Amex, Visa, Mastercard or Bank Transfer.
• Registrants paying by Credit Card will be sent an automatic email confirmation, with a receipt and badge barcode.
• Registrants choosing to pay by Bank Transfer will receive their confirmation, but their receipt and badge barcode will be sent only once payment has been received and cleared by Horizon House.

Onsite
• The registration area will be located at the entrance to the conference and exhibition in Pavilion 7, level 3 as sign posted.
• There will be Self Service terminals in the registration area where delegates can enter their details and pay immediately by swiping their credit cards through the readers attached to the terminals.
• Delegates can also choose to ‘Pay at Cashier’ and then proceed to the Cashier Point and pay using credit cards or cash. Receipts will be given accordingly.

If you have any questions regarding registration procedures and payment, please contact: eumwreg@aventri.com

BADGE COLLECTION AT FAST TRACK CHECK IN DESK
• All online registrants should bring a printed copy of their email registration receipt with the barcode and a photo ID. At the entry to the convention centre, they may scan the barcode at the Fast Track check-in desks and present their ID to obtain the badge.
• Online registrants without printed emails may also obtain their badges at the Self Service registration terminals (photo ID required).
• All onsite registrants using the Self Service terminals will receive their printed badge upon payment.

Once you have collected your badge, you can collect the conference proceedings on USB stick and the delegate bag for the conferences from the specified delegate bag area by scanning your badge. Processing will be quick and easy but queues may form at busy times, so please arrange to collect your badge well in advance of your first conference session.

COFFEE BREAKS, EUMIC GET TOGETHER, WELCOME RECEPTION AND EURAD LUNCH
• Upon presentation of their badge conference delegates will be served free coffee during the coffee breaks.
• There will be two coffee breaks per day. On Friday, there will be only one coffee break in the morning.
• Monday’s EUMIC Get-Together, which will be held on-site in room S01/S02/S03, is free of cost for EUMIC delegates.
• Tuesday’s Welcome Reception, sponsored by Keysight Technologies, will be held on-site in room S01/S02/S03. Badges must be presented at the entrance.
• Friday’s EuRAD LUNCH, which will be held in room S01/S02/S03, is free of cost for EuRAD delegates and Friday’s WS/SC delegates.

DELEGATE LUNCHBOXES
• Subsidised lunchboxes for delegates, WS/SC, doctoral and student school attendees are being offered by EuMW at the reduced cost of €7 per lunchbox (one per day). In order to guarantee availability, it is required to order the lunchboxes at the time of registration. Lunchboxes for the student challenge, the student design competitions and the WiM event should be ordered separately when you register for these activities. Visit www.eumweek.com for more information.

CONFERENCE LOCATION
The conferences will be held in different rooms over the conference dates. Please refer to the Conference Matrix. Registration at one conference does not allow access to the sessions of the other conferences.

www.eumweek.com | 21
Reduced rates are offered if you have society membership to any of the following: EuMA, GAAS, IET or IEEE. If you register for membership through the EuMW registration system, you will automatically be entitled to discounted member rates.

ADVANCE REGISTRATION CONFERENCE FEES (UP TO AND INCLUDING 30TH AUG.)

<table>
<thead>
<tr>
<th>CONFERENCE FEES</th>
<th>ADVANCE DISCOUNTED RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Society Member (*any of above)</td>
</tr>
<tr>
<td>1 Conference</td>
<td>€ 470</td>
</tr>
<tr>
<td>EuMC</td>
<td>€ 360</td>
</tr>
<tr>
<td>EuMIC</td>
<td>€ 320</td>
</tr>
<tr>
<td>2 Conferences</td>
<td>€ 670</td>
</tr>
<tr>
<td>EuMC + EuMIC</td>
<td>€ 640</td>
</tr>
<tr>
<td>3 Conferences</td>
<td>€ 550</td>
</tr>
<tr>
<td>EuMC + EuMIC + EuRAD</td>
<td>€ 810</td>
</tr>
</tbody>
</table>

WORKSHOP AND SHORT COURSE FEES (ONE STANDARD RATE THROUGHOUT)

<table>
<thead>
<tr>
<th>FEES</th>
<th>STANDARD RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Society Member (*any of above)</td>
</tr>
<tr>
<td></td>
<td>Standard</td>
</tr>
<tr>
<td>Half day WITH Conference registration</td>
<td>€ 100</td>
</tr>
<tr>
<td>Half day WITHOUT Conference registration</td>
<td>€ 130</td>
</tr>
<tr>
<td>Full day WITH Conference registration</td>
<td>€ 140</td>
</tr>
<tr>
<td>Full day WITHOUT Conference registration</td>
<td>€ 180</td>
</tr>
</tbody>
</table>

SPECIAL FORUM FEES

<table>
<thead>
<tr>
<th>ADVANCED RATE (UP TO &amp; INCL 30TH AUG.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive Forum Monday 30th September</td>
</tr>
<tr>
<td>STANDARD RATE (FROM 31ST AUG &amp; ONSITE)</td>
</tr>
<tr>
<td>ONE STANDARD RATE THROUGHOUT</td>
</tr>
</tbody>
</table>

Reduced Rates for the conferences are also offered if you are a Student/Senior (Full-time students 30 years or younger and Seniors 65 or older as of 4th October 2019). The fees shown below are invoiced in the name and on behalf of the European Microwave Association. EuMA’s supplies of attendance fees in respect of the European Microwave Week 2019 are inclusive of French VAT.
## EUROPEAN MICROWAVE WEEK WORKSHOPS AND SHORT COURSES

### SUNDAY 29th September

<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Code</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Day</td>
<td>WS-01</td>
<td>EuMC/EuMIC</td>
<td>Recent Advances in SiGe BiCMOS: Technologies, Modelling and Circuits for 5G, radar and imaging</td>
</tr>
<tr>
<td>Full Day</td>
<td>WS-02</td>
<td>EuMC/EuMIC</td>
<td>RF Techniques for 5G Applications</td>
</tr>
<tr>
<td>Full Day</td>
<td>WS-03</td>
<td>EuMC</td>
<td>Microwave Characterization and Modelling at Nano and Micro-Scale of Advanced Materials to Enhance Emerging Products Manufacturing</td>
</tr>
<tr>
<td>Full Day</td>
<td>WS-04</td>
<td>EuMC</td>
<td>Real Amplifier Devices for 5G New Radios</td>
</tr>
<tr>
<td>Full Day</td>
<td>WS-05</td>
<td>EuMC/EuMIC</td>
<td>Microwave measurements at systems, components and materials levels: a global approach to improve energy efficiency of the next generation of electronic devices</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>WS-06</td>
<td>EuMC</td>
<td>Future Wireless Technologies in the Terahertz and Optical Frequency Bands</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>WS-07</td>
<td>EuMC</td>
<td>New materials and technologies for reconfigurable RF components</td>
</tr>
<tr>
<td>Full Day</td>
<td>WS-08</td>
<td>EuMC/EuMIC</td>
<td>RF Technologies &amp; Techniques for Multi-Band Power Amplifiers for Radars and Communications</td>
</tr>
<tr>
<td>Full Day</td>
<td>WS-09</td>
<td>EuMC</td>
<td>THz Applications: Present and Future</td>
</tr>
<tr>
<td>Full Day</td>
<td>SS-01</td>
<td>EuMC</td>
<td>Fundamentals of Microwave PA Design</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>SS-02</td>
<td>EuMC/EuMIC</td>
<td>Silicon-Based Integrated Technology Platform for Millimeter Wave (MMW) and Terahertz (THz) Applications</td>
</tr>
</tbody>
</table>

### MONDAY 30th September

<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Code</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Day AM</td>
<td>WM-01</td>
<td>EuMC/EuMIC</td>
<td>Advanced CAD Tools and Techniques for the System Co-Design of Smart Antenna and Transmitter Modules</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>WM-02</td>
<td>EuMC</td>
<td>Phase Change Material for Microwave Applications</td>
</tr>
<tr>
<td>Full Day</td>
<td>WM-03</td>
<td>EuMC</td>
<td>Current and Future Use of Spectrum by PMSE</td>
</tr>
<tr>
<td>Full Day</td>
<td>WM-04</td>
<td>EuMC/EuMIC</td>
<td>Integration and multi-physics challenges in 5G mm-wave system design</td>
</tr>
<tr>
<td>Full Day</td>
<td>WM-05</td>
<td>EuMC</td>
<td>Terahertz Devices, Circuits and Systems: from fundamentals to applications</td>
</tr>
<tr>
<td>Full Day</td>
<td>WM-06</td>
<td>EuMC</td>
<td>Recent Advances in Technologies and Practical Realizations of Compact Filters</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>WM-07</td>
<td>EuMC/EuMIC</td>
<td>Technologies and modelling for electromagnetically-mediated medical treatments: at the beginning of the “electroceuticals” era</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>WM-08</td>
<td>EuMC</td>
<td>Advanced Microwave Systems for Emerging Healthcare Applications</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>WM-09</td>
<td>EuMC/EuMIC</td>
<td>New challenges and new trends mixing active and passive devices in silicon technology: from components to tunable RF functions</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>SM-01</td>
<td>EuMC</td>
<td>Multibeam Antennas and Beamforming Networks</td>
</tr>
</tbody>
</table>

### TUESDAY 1st October

<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Code</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Day AM</td>
<td>STu-01</td>
<td>EuMC</td>
<td>Antenna Booster Technology for IoT Applications</td>
</tr>
</tbody>
</table>

### WEDNESDAY 2nd October

<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Code</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Day</td>
<td>WW-01</td>
<td>EuMC/EuRAD</td>
<td>Advanced passive radar techniques and applications</td>
</tr>
<tr>
<td>Full Day</td>
<td>WW-02</td>
<td>EuMC/EuRAD</td>
<td>Radar Interference and Coexistence</td>
</tr>
</tbody>
</table>

### THURSDAY 3rd October

<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Code</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Day AM</td>
<td>WTh-01</td>
<td>EuRAD</td>
<td>Automotive Radar Systems and Signal Processing</td>
</tr>
<tr>
<td>Full Day</td>
<td>WTh-02</td>
<td>EuMC/EuRAD</td>
<td>Test Procedures &amp; Solutions, as well as simulation &amp; Validation of sensor functions and Entire Adas Systems</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>STh-01</td>
<td>EuRAD</td>
<td>Modern Advances in Computational Imaging at Microwave and Millimetre-Wave Frequencies</td>
</tr>
</tbody>
</table>

### FRIDAY 4th October

<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Code</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Day AM</td>
<td>WF-01</td>
<td>EuRAD</td>
<td>Automotive Radar Frontend Technologies</td>
</tr>
<tr>
<td>Full Day</td>
<td>WF-02</td>
<td>EuMC</td>
<td>Measurements and Waveguides for Millimetre-wave and Terahertz Frequencies</td>
</tr>
</tbody>
</table>
The Defence, Security and Space (DSS) Forum is jointly organized by the European Microwave Association (EuMA) and Microwave Journal to complement European Microwave Week’s activity in the Defence, Security and Space sector.

Each year the DSS Forum focuses on a hot topic that is engaging industry, academia and organizations/ agencies to develop, test and implement leading edge technology. In 2019 the topic is: New Radio Architectures: The Evolution for Satellite Constellations.

With the development of the commercial space market being driven by companies like SpaceX, Blue Origin and Virgin Galactic, the market has become more competitive and demanding for communications technology to evolve and innovate. New radio architectures are needed that use less power and have lower latency while still being low cost. Small and nano-satellites are also driving the same factors but to an extreme level for miniature systems.

The development of Satellite Constellations is growing due to increased demand in data rates and data traffic for wireless communications. 6G is expected to achieve Tbps data rates while the traffic will reach ZettaBytes in 2030 time frame. Proposals are based on the deployment of thousands low-cost micro-satellites in Low-Earth-Orbits for instance (LEO). This pushes the performance towards higher frequencies and much more powerful communication systems.

The RF and Microwave community in this forum will discuss how organizations are responding with new radio architectures to achieve these goals.

Keynote speakers will consider the state of the art of leading technologies and systems for satellite constellations, the estimated evolution of technologies and trends and consider expected capabilities and functionalities to address future challenges. The efforts made by the main players in the sector will be analysed and their views on new trends and technological developments will be offered.

The industry session will reflect the effort and investment that is being made to develop and test new radio architectures with improved size, weight and cost. Specific areas of activity include phased arrays, various types of beamforming, different RF partitioning, high efficiency solid state amplifiers, improved heat sinking materials, miniaturized radios and antennas, to name a few. Link and alternatives with respect to optical technologies will also be addressed as a complement to the communication technologies. From an industry perspective, the emphasis will be on development at component and sub-system level, with particular focus on subsystem integration, not forgetting the significant role that test and measurement has to play in moving the sector forward.

The Executive Forum will present the points of view of the different established and regulatory bodies that allow coexistence between the different aerial platforms and describe the activity of the different players already established and emerging in the field.

Programme

08:30 - 10:10 EuRAD Opening Session
10:10 - 10:40 Coffee Break
10:40 - 13:00 ‘Challenges in Satellite Constellations and impact on the communications technologies’
   Moderators: Dr. Patrice GAMAND, ALPHA-RLH Cluster, France and Dr. Erwan FOURN, IETR, France
   • The revival of Constellations in the 21st century: Roadmaps and Technology requirements. Emiliano RE. RF systems, payloads and technology division, ESA, ESTEC, The Netherlands
   • How optical innovation and Radio-Frequency team-up for higher satellite communication throughput? Dr. David ALLOUX, - CAILABS, France.
   • The “Space Data Highway” from Babacar SECK, CEO, Leads-Aerospace, France
   • Conference from Isabelle BURET, Telecom Business Line Technical Authority & Iridium Program Design Authority, Thales Aelina Space, France
13:00 - 14:00 Strategy Analytics Lunch & Learn Session – Global Satellite Market Outlook
Asif Anwar will discuss the global market outlook for both military and commercial satellites underpinned by a discussion on how the emergence of small satellite buses and LEO constellations will change the make-up of satellite communication systems. He will cover specifics such as phased arrays and solid-state technology. Asif Anwar, Strategy Analytics, UK
14:10 - 15:50 Microwave Journal Industry Session
This session offers a perspective on how industry is aiming to design, develop and test radio architectures and the challenges that need to be addressed to implement them. Various trade-offs in radio architectures will be covered along with solid state technologies, phased arrays and packaging concerns.
15:50 - 16:20 Coffee Break
16:20 - 18:00 Round table: Concepts, technologies and systems addressing ultra-high capacity and data traffic for future wireless communications.
   Moderator: Dr. Patrice GAMAND, ALPHA-RLH Cluster, France and Dr. Erwan FOURN, IETR, France
   Speakers:
   • Jan THOEMEL, GomSpace, Luxembourg. Head of Satellite operation
   • Babacar SECK, Leads-Aerospace, CEO
   • Emiliano RE, ESA, Radio Frequency Systems Division
   • Jean-François BOUTILLON, Thales Aelina Space, Constellation Solutions Line Manager
   • Guy KOUEMBOU, HENSOLTD, Technology Manager
   • David ALLOUX, CAILABS, Engineering Manager
18:00 - 18:30 Cocktail Reception
The opportunity to network and discuss informally the issues raised throughout the Forum.

Registration and Programme Updates
Registration fee is €20 for those who registered for a conference and €60 for those not registered for a conference. The Conference Special Events section of the EuMW website will give further details and updates.
The 2019 Automotive Forum

When: Monday 30th September, 08:30 to 17:50
Location: Room 741A + dinner
Chair: Thomas Zwick, Karlsruhe Institute of Technology, Germany
Co-Chair: Frank Gruson, Continental AG, Germany
Local Arrangement Chair: Stéphane Méric, INSA de Rennes, IETR, France

Following applications like keyless entry and tyre pressure monitoring systems, mobile communications and recently automotive radar made microwave technologies be a strong pillar inside the automotive world. The first 77 GHz automotive radar sensors entered the European market in 1999. In 2019 – 20 years later – the European Microwave Association (EuMA) for the first time organises the Automotive Forum to provide an open platform for industrial experts to discuss technical aspects and market issues in the area of microwaves in automotive industry. The forum consists of a good mix of technical presentations, plenary and panel discussions as well as networking time. The forum mainly addresses technical experts from automotive industry throughout the whole supply chain. Keynote speakers will present their views on special technical solutions as well as regulatory or strategic issues. The event will close with a networking dinner.

Programme

8:30-8:50 Automated Driving: Market Perspective for Radar
Cédric Malaquin, Yole, France

8:50-9:10 The Role of Automotive Radars in Future Automated Driving Functions
Martin Kunert, Robert Bosch GmbH, Germany

9:10-9:30 Safety First – Critical Performance Requirements for High Frequency Laminates in 76-81 GHz Automotive Radars to Enable Next Generation Advanced Driver Assistance Systems (ADAS)
Ingmar van der Linden, Rogers Corporation, USA

9:30-9:50 A Study of Antenna Performance Influence on mm-Scale Dk Variation in PCB Substrate
Tatsunari Koyama, Nippon Pillar Packaging CO., Japan

9:50-10:10 Labelling of Data for Classification with Automotive Radar Sensors
Florian Baumgärtner, Daimler AG, Germany

10:10-10:50 Coffee

10:50-11:10 Radar Data Classification and Generation with Deep Learning
Robert Prophet, Friedrich-Alexander University Erlangen-Nuremberg, Germany

11:10-11:30 Leveraging Artificial Intelligence in Imaging Radars to transform Environment Sensing into Autonomous Decision Making
Noam Arkind, Arbe, Israel

11:30-11:50 Deep Learning Approaches for Radar Based 3D Object Detection
Georg Kuschk, Astyx GmbH, Germany

11:50-12:10 Artificial Intelligence in Automotive Radar

Jonathan Wache, Continental AG, Germany

12:30-13:50 Lunch

13:50-14:10 Beyond MIMO: 5G Radar = Digital Modulation Radar (DMR)
Ralph Reuter, Uhnder Inc., Germany

14:10-14:30 Performance of Automotive Radar Raw Data Repair Algorithms with Measured Signals
Jonathan Moss, Veoneer, Germany

14:30-14:50 FFT-Peak as Output for High Resolution Radar
Andre Roger, Infineon Technologies AG, Germany

14:50-15:10 A Study of the Accurate Occupancy Grid Mapping Generation by 3D Radar
Hidetoshi Yomo, Panasonic, Japan

15:10-15:30 Advanced Methods for Mitigation of Mutual Interference in FMCW Radar Systems
Paul Meissner, Infineon Technologies AG, Austria

15:30-16:10 Coffee

16:10-16:30 IMIKO-Radar: Towards Cooperative Radar-Interference Mitigation
Werner Sörgel, Robert Bosch GmbH, Germany

16:30-16:50 Simulation of Polarimetric Radar Cross-Sections of Pedestrians for Automotive Radar
Anshu Gupta, ADC Automotive Distance Control Systems GmbH, Germany

16:50-17:10 Closed Loop Testing of Radar-Sensors with Synthetic Raw Data derived from Real-Time Raytracing
Sebastian Graf, dSpace, Germany

17:10-17:30 The Coded MIMO Radar System Design and the Consideration of the New Technologies Verification and the Estimation Method for the Coexisting Issue with FMCW Radar
Seung Chul Shin, Keysight Technologies, USA

17:30-17:50 Novel CATR-based Target Generation System for Automotive Radar Testing
Daniel Markert, Rohde & Schwarz GmbH & Co. KG, Germany

19:30 Networking dinner
Location will be provided during the workshop.

Registration and Programme Updates
Advanced Registration fee (up to & incl. 30th August) is €260 for those who registered for a conference and €360 for those not registered for a conference. Standard Registration fee (from 31st August & Onsite) is €320 for those who registered for a conference and €420 for those not registered for a conference. The networking dinner as well as a lunch snack and beverages are included in the fee. The Conference Special Events section of the EuMW website will give further details and updates. Due to limited room size early registration is recommended.

www.eumweek.com | 25
EuMW 2019 Student Design Competitions

When: Tuesday 1st October and Wednesday 2nd October, 2019
Location: Dedicated Booth next to Registration Desk

Dr Benjamin Potelon (Lab-STICC - Université de Bretagne Occidentale, Brest, France) & Prof. Pierre Blondy (XLIM - Université de Limoges, Limoges, France)

The Student Design Competitions involve master and doctoral students designing and measuring a microwave device developed prior to the conference. This competition is open to all students. Measurements will be open to all EuMW participants. A representative of the design team must be present at the competition day. The Student Design competitions are centred on three topics and please refer to the student’s activities web site for detailed design rules and specifications.

This year, three competitions will be offered:

**Thrust 1: PA Design, organised and sponsored by AMCAD Engineering (Booth 320D)**
When: Tuesday 1st October – 08:30 to 12:30
The aim of the Thrust 1 is to design a power amplifier at the frequency 3.5 GHz, with a video bandwidth target of 100MHz. The amplifier should deliver a minimal output power of 35dBm at 1 dB of Gain compression, with the highest PAE. This thrust is supervised by Tony Gasseling (gasseling@amcad-engineering.fr).

How to participate
1. Request the entry form (gasseling@amcad-engineering.fr)
2. Submit the entry form to Tony Gasseling before 15th of September 2019
3. Submit a brief report including simulations, layout, and measurements before the competition. (The selected projects will receive an acceptance letter to attend the competition.)

**Thrust 2: Wideband Amplifier Biasing Network, organised and sponsored by Ampleon Netherlands BV**
When: Tuesday 1st October – 13:50 to 17:50
Thrust 2 will introduce the students to the RF high power amplifier (HPA) biasing for wideband applications. This thrust is supervised by Osman Ceylan (osman.ceylan@ampleon.com).

Biasing networks has a key role on the video bandwidth (VBW) and RF performance of HPAs. The main target of the contest is design and realization of a biasing network considering low insertion loss at the operation bandwidth and low impedance at the low frequency region. The competitors will design and fabricate a biasing network having the resonance-free low impedance response at the low frequency region. Although students are free to use any topology and material, they need to meet a given set of specifications.

The winner will be the network that demonstrates the widest bandwidth regarding the lowest input impedance at the low frequency region. If there is a tie, wider accepted operation BW will be the winner. Questions can be sent to Dr. Osman Ceylan.

Winners will be awarded € 1000 (1st place) and € 500 (2nd place). Promising designs will be also awarded € 250.

How to participate
1. Request the entry form (osman.ceylan@ampleon.com)
2. Submit the entry form to Osman Ceylan before 15th of September 2019
3. Submit a brief report including simulations, layout, and measurements before the competition. (The selected projects will receive an acceptance letter to attend the competition.)

**Thrust 3: Filter Design (sponsored by Elliptika – booth A050)**
When: Wednesday 2nd October – 08:30 to 12:30
Thrust 3 is meant to develop a dual-band filter design prior to the conference. This thrust is supervised by Dr Benjamin Potelon (benjamin.potelon@univ-brest.fr) & Prof. Pierre Blondy (pierre.blondy@xlim.fr).

The winner team will be awarded € 1000 and will be offered the opportunity to propose an invited paper in the International Journal of Microwave and Wireless Technologies to detail the design of their filter. The second team will be awarded € 500.

Please refer to the student activities section on the website for design rules and specifications. Questions can be sent to Dr. Benjamin Potelon & Prof. Pierre Blondy.

Please refer to the student’s activities web site for design rules and specifications.

How to participate:
1. Request the entry form (benjamin.potelon@univ-brest.fr and pierre.blondy@xlim.fr).
2. Submit the entry form to Benjamin Potelon and Pierre Blondy before 15th of September 2019
3. Submit a brief report including simulations, layout, and measurements before the competition. (The selected projects will receive an acceptance letter to attend the competition.)

For further information please visit: www.eumweek.com.
**4th European Microwave Student School ‘Software Defined Radio: Basic blocks and Hands-on Practice’**

**When:** Tuesday 1st October and Wednesday 2nd October 2019  
**Location:** Room 746 on Tuesday and Specific booth next to Registration Desk on Wednesday  
**Organisers:** Florence Podevin and Estelle Lauga-Larroze (Univ. Grenoble Alpes, Grenoble, France)

**About the European Microwave Student School**  
This year’s European Microwave Week features the 4th European Microwave Student School for bachelor and master students. The program features academic lecturers from all over the world. This year’s topic is dedicated to Software Defined Radio (SDR) with a focus on basic blocks design and the opportunity to practice hands-on activities on SDR. Precisely, the course will be formed by a full day of high level lectures on transmission lines, planar RF components, power amplifiers and mixers on Tuesday. Hands-on design experience will be proposed on Wednesday: in collaboration with PhD students registered at the Doctoral School, students will build a modern digital transceiver.

**Earning Credit Points**  
The European Microwave Student School will offer certificates to all attendees for earning credit points within the European Credit Transfer System (ECTS). If you need to have a written or oral exam, please contact your professor well in advance for arranging the details of the examination process. By request of your professor via email to eumw2019studentevent@unilim.fr we will provide an exam sheet for oral or written examination by the beginning of October 2019.

**Registration**  
The registration fee for this event is €40. For the registration, bachelor and master students will need a valid student ID of an accredited university. Students are prompted to bring their own laptops. For registration, please go to the registration site and select EuMW Student School. For further information please visit: www.eumweek.com.

Registration closes 10th September 2019. Space is limited, so purchase your ticket well in advance.

**Programme**

<table>
<thead>
<tr>
<th><strong>Tuesday 1st October</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-8:45</td>
<td>Student School presentation</td>
</tr>
</tbody>
</table>
| 8:45-10:10             | General overview on transmission lines  
Philippe Ferrari, Univ. Grenoble Alpes, Grenoble, France  |
| 10:10-11:00            | Long time break to visit the Exhibition Hall:  
Career Platform and Industrial Booth  |
| 11:00-12:30            | Planar passive devices, hybrid coupler and power dividers  
Roberto Gomez-Garcia, Universidad de Alcala, Madrid, Spain  |
| 12:30-13:50            | Lunch and break to visit the Exhibition Hall:  
Career Platform and Industrial Booth  |
| 13:50-15:30            | Power amplifiers  
Antonio Lisboa Da Souza, Universidade Federal da Paraiba, Joao Pessoa, Brazil  |
| 15:30-16:10            | Long time break to visit the Exhibition Hall:  
Career Platform and Industrial Booth  |
| 16:10-17:50            | General overview on mixers and applications  
Justin King, Trinity College Dublin, Dublin, Ireland  |

<table>
<thead>
<tr>
<th><strong>Wednesday 2nd October</strong></th>
<th></th>
</tr>
</thead>
</table>
| 9:00-12:30              | Hands on activity - Building a modern digital transceiver in one day  
David S. Ricketts, North Carolina State University, Raleigh, USA  |
| 12:30-13:50             | Lunch  |
| 13:50-17:50             | Hands on activity - Building a modern digital transceiver in one day  
David S. Ricketts, North Carolina State University, Raleigh, USA  |

For updates to the programme, visit www.eumweek.com/students/Studentschool.html
**SPECIAL CONFERENCE EVENTS**

**4th European Microwave Doctoral School ‘Emerging Technologies for Reconfigurable Radio and Hands-on Practice’**

When: Tuesday 1st October until Wednesday 2nd October, Location: Room 741BC on Tuesday afternoon and Specific booth next to Registration Desk on Wednesday

Organisers: Florence Podevin and Estelle Lauga-Larroze (Univ. Grenoble Alpes, Grenoble, France)

About the European Microwave Doctoral School
Following the success of the previous editions, this year’s European Microwave Week features the 4th European Microwave Doctoral School. The aim of the Doctoral School is to offer to PhD students, beyond the normal conference programme, an overview of various emerging technologies. This year thematic is devoted to reconfigurable radio. The School gathers several speakers that develop their research in different topics linked to this field. The talks of the Doctoral School are longer (50 min) than typical conference presentations. Additionally, the School includes a Hands-on Design Experience on Wednesday: in collaboration with master students registered at the Student School, PhD students will build a modern digital transceiver. Attention has to be paid on the free Tuesday morning enabling preferential access to the Career Platform.

Registration
The registration fee for this event is €80. For the registration, PhD students will need a valid student ID of an accredited university. Students are prompted to bring their own laptops. For registration, please go to the registration site and select EuMW Doctoral School. Registration is open until 10th September 2019. Space is limited, so secure your ticket well in advance.

For updates to the programme, visit www.eumweek.com/students/doctoralschool.html

**EuMW 2019 Student Challenge**

When: Tuesday 1st October until Thursday 3rd October
Location: Room 741BC on Tuesday and Interactive session Area (e-Poster exhibition hall) on Thursday

Eligible students are invited to take part in the Student Challenge during EuMW 2019. The Student Challenge is an opportunity for undergraduate and graduate students (Bachelor, Master, and Doctoral students) from all over the world with a variety of academic backgrounds, to work together on a specific topic in the wide and exciting field of microwaves. The aim is to promote innovative thinking, teamwork and pro-active behavior; skills future employers will highly value. Kick-off will take place on Tuesday 1st October morning.

**Teams**
Each team is composed of a maximum of four members, preferably from different institutions and with a variety of backgrounds. All teams will present, explain, and defend a fresh, visionary, application-oriented concept by a short presentation (ePoster). The presentation must be based on at least two papers presented at the EuMW 2019, of which only one paper may be authored by a member of the team. Eventually, each team will give an elevator pitch of the innovative concepts they have devised.

Contestant are invited to register prior the 15th of September 2019 to secure their participation. Late registration till Tuesday 1st October is possible but will be subject to the limited participant number. Contestant are invited to bring their own laptop if possible, to ease their creative work.

**Evaluation Criteria**
- Novelty of the idea
- Relevance of the solution/vision proposed
- Feasibility of the idea
- Clarity of the poster
- Clarity of the oral presentation and discussion

**Registration**
To register, please send an e-mail to eumw2019studentevent@unilim.fr and attach a copy of your student identity card or a confirmation, signed by your responsible professor. The deadline for registration is 10th September 2019. Updated information can be found at the EUMW 2019 web site.

**Programme**

**Tuesday 1st October**
- 13:50-14:00 Doctoral School presentation
- 14:00-14:45 RF Circuit Design with the Inversion Coefficient: Application to LNA Implementations
  - Thierry Taris, Univ. of Bordeaux, Bordeaux, France
- 14:45-15:30 Innovative switches for reconfigurability with PCM / SOI / MEMS
  - Bruno Reig, CEA-Léti, Grenoble, France
- 15:30-16:10 Break
- 16:10-17:00 Microwave Filtering through Signal Interference
  - Roberto Gomez-Garcia, Universidad de Alcala, Madrid, Spain
- 17:00-17:50 Beam-Forming and Antennas
  - Luigi Boccia, Universita’ della Calabria, Cosenza, Italy

**Wednesday 2nd October**
- 9:00-12:30 Hands on activity - Building a modern digital transceiver in one day
  - David S. Ricketts, North Carolina State University, Raleigh, USA
  - 12:30-13:50 Lunch
- 13:50-17:50 Hands on activity - Building a modern digital transceiver in one day
  - David S. Ricketts, North Carolina State University, Raleigh, USA

For updates to the programme, visit www.eumweek.com/students/doctoralschool.html
EuMW 2019 Career Platform

The Career Platform is a two-day event (October 1st and 2nd) within the European Microwave Week 2019 and it is part of the student activities organized by the EuMW 2019 team with the additional support of EuMA and the IEEE MTT-S / Region 8 Young Professionals. The Career Platform is an opportunity for young European graduates to get in touch with those companies making an impact in today’s high-frequency business and to know their main activities, application fields, and market indicators, and for the companies to recruit young talent in the areas of microwave / millimetre-wave, radar, wireless and integrated circuits engineering.

The main aim of the EuMW 2019 Career Platform initiative is to foster relationships between the young engineers and the job market. To this end, a special session will be held on "The European Microwave Industry market and Professional Opportunities" on Tuesday, October 1st. The Career Platform will also include a speed-recruiting lounge where companies and institutions will show their current job/internship offers. All this will be complemented by an active presence in the social networks (Facebook, LinkedIn, Xing) during the conference and the maintenance of the European RF and Microwave job portal http://www.rf-and-microwave-jobs-in-europe.eu which is the virtual marketplace for students and companies to meet at and in-between European Microwave Weeks. Further information can be found at: www.eumweek.com/docs/Career_platform.html.

Please feel free to contact the Career Platform Chair at jean-luc.polleux@esiee.fr with any questions you may have or to obtain additional details.

Career Platform Special Session
The European Microwave Industry Market and Professional Opportunities
Date: Tuesday 1st October 2019
09:00 -10:40
Location: Special space organised at the boundary of the conference spaces and of the exhibition.
No registration – free access (including visitors)

The special session will describe the main market of the European Microwave Industry with a focus on Professional Opportunities in each of the main sectors. Top industry leading speakers will give their vision and insights.

Women-In-Microwaves Get-Together on the Career Platform
Date: Wednesday 2nd October 18:00-18:30
Registration through the WIM event
Location: Career Lounge

Career Platform Recruitment Space
Date: Tuesday 1st October and Wednesday 2nd, October 2019
Time: full day - exhibition hours
Location: Special space organised at the boundary of the conference spaces and of the exhibition.
No registration – free access (including visitors)

The Career Platform will be an excellent opportunity for companies to meet students and young engineers looking for a career in the areas of high frequency, microwave, millimetre-wave engineering and Radar. An additional special Women-in-Engineering gathering will be also organised on the career lounge on Wednesday at 17:50. Come and join us.

Young Professionals Evening Meet-up
Date: Thursday 3rd October, 19:00-23:00
Location: down-town location, to be confirmed / Registration through www.eumweek.com/docs/Career_platform.html
Brought to you by IEEE MTT-S and IEEE Region 8 Young Professionals

Career Platform Recruitment Space
Date: Tuesday 1st October and Wednesday 2nd, October 2019
Time: full day - exhibition hours
Location: Special space organised at the boundary of the conference spaces and of the exhibition.
No registration – free access (including visitors)

The Career Platform will be an excellent opportunity for companies to meet students and young engineers looking for a career in the areas of high frequency, microwave, millimetre-wave engineering and Radar. An additional special Women-in-Engineering gathering will be also organised on the career lounge on Wednesday at 17:50. Come and join us.

Special Session on “From Instrumentation to Metrology”
- Women in Microwave Engineering Event

Date: Tuesday 1st October 2019
Duration: 13:00-17:50
Location: WiM stand, Room E07
Organiser:
WIM Chair: Audrey MARTIN, University of Limoges, France
WIM Co-chair: Anne Laure FRANC, University of Toulouse, France

We continue the tradition of holding the Women in Microwave Engineering (WiM) event, co-sponsored by the IEEE MTT-Society. This year’s event, focusing on Instrumentation and Metrology, will take you on a visit to "Musée des Arts et Métiers — CNAM" (https://www.arts-et-metiers.net). This is your chance to follow in the footsteps of inventors and pioneers of progress and explore a one-of-a-kind repository of scientific and technical knowledge. Both women and men are welcome.

Before visiting the museum, presentations will be done by scientists:
- 'Over-the-Air Test: From AM Radio to mmWaves'
  Dr. Kate A. REMLEY from NIST (USA)
- 'See the World Outside of the Design Lab'
  Dr. Amele SALAH from Keysight (France)
- 'Oscilloscope-Based Setups for the Nonlinear Characterization of Microwave Transistors’
  Dr. Valerie VADALA from Univeristy of Ferrara (Italy).

Attendees will have the opportunity to interact with high school students who are invited to participate in this event, Bus transportation to the museum will be provided.

Please register for the event by sending an e-mail to:
audrey.martin@xlim.fr

Note that places are limited and assigned on a first-come first-served basis. For more information and registration details, please visit: https://www.eumweek.com/docs/women_microwave.html
Welcome to Paris!

Paris' monument-lined boulevards, museums, classical bistro’s and boutiques are enhanced by a new wave of multimedia galleries, creative wine bars, design shops and tech start-ups.

The cloud-piercing Eiffel Tower, broad Arc de Triomphe guarding the glamorous avenue des Champs-Élysées, Gargoyled Notre Dame cathedral, Lamplit bridges spanning the Seine and art nouveau cafes’ wicker-chair-lined terraces are enduring Parisian emblems. Paris’ cityscape isn’t static: there are some stunning modern and contemporary icons, too, from the industrial-style Centre Pompidou to the Mur Végétal gracing the Musée du Quai Branly, the glass sails of the Fondation Louis Vuitton contemporary-art centre, and the gleaming steel egg-shaped concert venue La Seine Musicale.

France’s reputation for its cuisine precedes it, and whether you seek a cosy neighbourhood bistro or a triple-Michelin-starred temple to gastronomy, you’ll find that every establishment prides itself on exquisite preparation and presentation of quality produce, invariably served with wine. Enticing patisseries, boulangeries, fromageries and colorful street markets are perfect for putting together a picnic to take to the city’s beautiful parks and gardens.

Paris is one of the world’s great art repositories, harbouring treasures from antiquity onwards. In addition to big hitters like the incomparable Louvre, the Musée d’Orsay’s exceptional impressionist collection, and the Centre Pompidou’s cache of modern and contemporary art, scores of smaller museums showcase every imaginable genre, a diverse range of venues mount major exhibitions through to offbeat installations, and there’s also the city’s vibrant street art.

Paris Open Tour: The best view of Paris…

Be guided by commentaries available in 10 languages. Hop on and off as you please and enjoy fantastic views from the open top deck of our buses! One pass, 3 routes and 34 stops to explore Paris at your own pace! Main bus stops are Madeleine, Opéra, Musée du Louvre, Notre-Dame, Saint-Germain-des-Prés, Musée d’Orsay, Concorde, Champs-Elysées, Arc de Triomphe, Tour Eiffel, Trocadéro, Invalides, Montmartre-Anvers, Gare du Nord, Les Grands Boulevards, Gare Saint-Lazare, Saint-germain, Montparnasse, Saint-Paul, Bastille, Gare de Lyon, Bercy…

1 Day pass - €34.00, 2 day pass - €38.00, 3 day pass - €42.00, Children passes €17.00

Batobus + Open Tour

Combine the 3 circuits and 34 stop-offs of the Open Tour panoramic bus with the 8 Batobus stops along the Seine river and you can be sure to see every nook and cranny of the French capital in two days.

Open Tour: Tickets From €47.00
The 10 best things to do in Paris!

Musee d’Orsay
This beautiful museum, once a railroad station, now houses a staggering collection of Impressionist art, as well as other items created between 1848 and 1914.

Louvre Museum
Home to Leonardo da Vinci’s Mona Lisa, the Louvre is considered the world’s greatest art museum, with an unparalleled collection of items covering the full spectrum of art through the ages.

Château de Versailles
The Château de Versailles is the symbol of the French monarchy. Originally a simple hunting pavilion for King Louis XIII, it was transformed into the marvel it is today under Louis XIV’s orders as a means to establish dominance over the nobles and to leave his trace upon the world.

Eiffel Tower
Completed in 1889, this colossal landmark, although initially hated by many Parisians, is now a famous symbol of French civic pride.

Le Marais
Located on a land-filled swamp, this revitalized neighbourhood, once a centre of high culture, fell into disrepair following the French Revolution, but has regained prominence.

Montmartre
Located in the 18th Arrondissement, this elevated rural neighbourhood on the outskirts of the city has a collection of upscale shops and cafés and still exudes hints of old village charm.

Tours!
Paris offers a wide selection of Guided, Walking, Cycling, Bus, Boat and Night Tours there really is something for everyone.

Must See!
Moulin Rouge - The most famous cabaret in the world!

Admire a troupe of 60 artists from all over the world who perform twice each evening in the revue ‘Féerie’, a show made up of four breath-taking tableaux: feathers, rhinestones, sequins, sparkling decor, acrobats, original music, international attractions...

Seine River
This famous river flows from east to west through the heart of the city and divides Paris’s Left Bank and Right Bank.

Sainte-Chapelle
The Sainte-Chapelle is the finest royal chapel to be built in France and features a truly exceptional collection of stained-glass windows. It was built in the mid 13th century by Louis IX, at the heart of the royal residence, the Palais de la Cité. It was built to house the relics of the Passion of Christ.

Palais Garnier - Opera National de Paris
This performance hall hosts opera, ballet and chamber music performances.

Arc de Triomphe
The Arc de triomphe was begun in 1806, on the orders of Napoleon I to honour the victories of his Grande Armée. Inspired by the great arches of antiquity, the monument combines the commemorative with the symbolic and it has always played a major role in the national republican consciousness. Every evening, the flame is lit on the tomb of the Unknown Soldier from the Great War. An exhibition portrays the history and explains its symbolic importance, nationally as well as internationally. The terrace provides superb views both by day and night across the city and its great sweeping avenues.

If you would like any other information or would like to book any tickets, please contact Sally Garland on sally@connexhotelsandevents.com or visit Paris’ Official Website and Visitors Bureau https://en.parisinfo.com/
MONDAY

EuMIC01
Integrated mmWave Circuits on BiCMOS & CMOS
Chair: Dominique Leneaerts¹
Co-Chair: Julien Lintignat²
¹NXP Semiconductors, ²XLIM UMR 7252, University of Limoges/CNRS

EuMIC02
GaN Characterisation and Modelling
Chair: Alberto Santarelli¹
Co-Chair: Rocco Groppi²
¹University of Bologna, ²University of Rome Tor Vergata

EuMIC03
GaN Technology and Device Characterization for Improved Circuit Demonstrators
Chair: Didier Fiorini¹
Co-Chair: Eric Bergeaud²
¹United Monolithic Semiconductors SAS, ²Telecom-ParisTech

EuMIC01-1
High Performance 60 GHz Bidirectional Phased Array Front End in SiGe BiCMOS
Roee Ben-Yishay¹, Oded Katz¹, Benny Shelnman¹, Danny Elad¹
¹ON Semiconductor

EuMIC02-1
Time Domain Drain Lag Measurement and TCAD-based Device Simulations of AlGaN/GaN HEMT: Investigation of Physical Mechanism
Nandha Kumar Subramani¹, Mohamed Bouslama¹, Raphael Sommet¹, Jean-Christophe Nallatamby¹
¹XLIM Research Institute, University of Limoges, Limoges, France

EuMIC03-1
GaN for 5G: A Material Perspective on Challenges and Solutions up to mm-Wave Frequencies
Marianne Germain¹
¹EPIGAN

EuMIC01-2
Ultralow Power, 3.15mW, 76.7 GHz Digitally Controlled Oscillator in 65 nm CMOS for High Data-Rate Application
Yanlu Wang¹, Muh-Dey Wei¹, Renato Negra¹
¹RWTH Aachen University

EuMIC02-2
Comparison of Harmonic Balance Simulated and Measured Ultra-short Low Frequency/Microwave Transients in Pulse to Pulse Characterization of GaN transistors
Manveen Ben Sasa¹, Guillaume Neveux¹, Denis Barauff¹
¹XLIM UMR7252, University of Limoges/CNRS, Limoges, France

EuMIC03-2
Drain Current Recovery Time Analyses of InAlGaNP/GaN HEMTs Realized with a Back-Barrier Buffer Layer
Stéphane Podrzczcy¹, Clément Polot¹, Jean-Claude Jacquet¹, Jean-Christophe Nallatamby¹, Michel Prigent¹, Philippe Mortaré¹, Eric Charlier¹, Christian Dual¹, Paolo Gambara¹, Cédric Lascelles¹, Nicolas Michel¹, Mourad Oualli¹, Olivier Patard¹, Sylvain L. Delega¹
¹III-V Lab, ²XLIM, University of Limoges

EuMIC01-3
Feasibility Demonstration of a Ka-Band Linearized Channel Amplifier in Silicon Technology for Space Applications
Olivier Jarde¹, Manuel Petrosaru¹, Victor Manuel Laul¹, Stéphane Rochette¹, Jeannine Prades¹, Anthony Ghisetti¹, Hervé Leliod¹, Nathalie Delnief², Jean-François Villeneuve²
¹Thales Alenia Space France, ²University of Bordeaux, IMS laboratory

EuMIC02-3
Characterization of Different Technologies of GaN HEMTs of 0.15 µm Ultra-Short Gate Length: Identification of Traps Using TCAD Based 2D Physics-based Simulation
Mohamed Boulamia¹, Raphael Sommet¹, Jean-Christophe Nallatamby¹
¹XLIM Research Institute, University of Limoges, Limoges, France

EuMIC03-3
Degradation of Ka band GaN Low-Noise Amplifier under High Input Power Stress
Xiaodong Tong¹
¹Microsystem & Terahertz Research Center, China Academy of Engineering Physics

EuMIC01-4
A Differential Traveling Wave Active Power Divider in 130 nm SiGe:BiCMOS Technology for Application in Receiver Synchronization
Eesa Raad Barmadi¹, Abdul Rahman Javed¹, Karthik KrishnanGoida¹, Ingmar Kallfass¹
¹University of Paderborn, ²Brandenburg University of Technology

EuMIC02-4
Narrow-Pulse-width Double-Pulsed S-Parameters Measurements of 100-nm GaN-on-Si HEMTs
Alberto Maria Angedda¹, Gian Piero Ghilardi¹, Cristian Flusser¹, Alberto Santarelli¹
¹University of Bologna

EuMIC03-4
A Segmented Internally-Matched Class G GaN Power Amplifier for High Duty Cycle C-Band Radars
Gabriele Formicone¹, James Custer¹
¹Integra Technologies, Inc.

EuMIC01-5
Broadband Linearization Technique for mmWave Circuits
Alok Sethi¹, Jeroen Ruysenaars¹, Jannes P. Akkø¹, Arnon Parnas¹, Timo Rajkowen¹
¹University of Oulu

EuMIC02-5
GaN HEMT Model with Enhanced Accuracy under Back-off Operation
Valeria Vadalà¹, Antonio Raffo¹, Ken Nakatani¹, Hiroshi Yamamoto¹, Gianni Boi¹, Kazukazu Inoue¹, Norihiko Ui¹, Giorgio Vannini¹
¹University of Ferrara, ²Fondazione Bruno Kessler, ³Sumitomo Electric Industries

EuMIC03-5
A GaN-HEMT with Floating LF Ground for Reverse Operation in Integrated RF Power Circuits
Olaf Bengtsson¹, Sophie Paul¹, Wolfgang Heinrich¹
²Ferdinand-Braun-Institut
MONDAY

EuMIC04
EuMIC Opening Session

Chairs: Farid Medjdoub¹, EuMIC 2019 Chair and Jean-Christophe Nallatamby², EuMIC 2019 TPC Chair
Co-chairs: Hervé Blanck³, EuMIC 2019 Co-Chair and Joaquin Portilla⁴, EuMIC 2019 TPC Co-Chair.
¹IEMN-CNRS, ²XLIM Research Institute - UMR CNRS 7252, ³UMS-GmbH, ⁴UPV/EHU

10:50 - 11:00
Welcome Address
Opening of the European Microwave Integrated Circuits Conference 2019
Farid Medjdoub, EuMIC 2019 Chair
Jean-Christophe Nallatamby, EuMIC 2019 TPC Chair

11:00 - 11:45
BiCMOS Integrated Millimeter-Wave Circuits for Short-Range Wireless Communications and Sensing
Prof. Dr.-Ing. habil. Dietmar Kissinger, Ulm University

High-performance BiCMOS processes based on silicon-germanium heterojunction bipolar transistor modules are the technology of choice for the realization of millimeter-wave integrated circuits with a strong presence of competitive semiconductor fabs in Europe. They offer sufficient yield for circuits of high complexity at moderately low manufacturing cost for medium to high-volume products.

Electromagnetic waves in the millimeter-wave spectrum (30 - 300 GHz) are still capable of sufficient transmission in harsh environments such as fog or dust and can penetrate dry fabrics. At the same time the high carrier frequency results in geometrically small frontends with a large achievable absolute bandwidth, enabling miniaturized broadband circuits for ultra-fast wireless communication systems and high-resolution sensors for point-to-point and near-field applications. However, this frequency range also poses a number of challenges on the circuit design and interconnect/assembly, including novel system architectures and concepts.

This talk presents latest research results in the area of complex integrated electronic millimeter-wave circuit solutions in state-of-the-art SiGe BiCMOS technologies addressing the above-mentioned challenges. The presentation will cover different frontend architectures and integration concepts from 60 to 240 GHz toward highly-integrated transceiver frontends with high degrees of miniaturization and scalable channel solutions for massive arrays with flexible operation. Applications of the presented circuits include mobile or reconfigurable short-range/backhaul communication links and broadband near-field sensors for autonomous transportation, human-machine interfaces and bioanalysis.

11:45 - 12:30
Trends in Active Antennas and T/R Modules for Radar and Multi-Function Systems
Yves Mancuso, Thales Defence Mission Systems (TDMS)

The Thales presentation consists of new developments and breakthroughs in Phased Arrays Radars, Electronic Warfare and MultiFunction systems for the new generations of T/R modules, in order to decrease the mass production cost, while increasing the level of performance and reliability. In the 'brick' architecture, all elements of active channels (radiating elements, distributions and active components) are disposed perpendicularly to radiating aperture plane, hence resulting in heavy, bulky and complex antenna structures. The 'tile' architecture consists in a novel architecture for active arrays where radiating elements, RF and electronic components for transmit and receive channels are organized in layers, parallel to the radiating aperture plane. In terms of physical architecture, the tile concept has been applied in Thales Defence Mission Systems (TDMS) for conformal and/or multifunction phased array antennas: a 3-dimension module will lead to a drastic reduction of size and weight of the antenna. A complete 'tile' structure is obtained with a multi-layer structure where the radiating elements are connected to 3D RF modules through a cooling plate, RF combiners and dividers, via plated-through holes and compressive RF connectors.

Trends for T/R modules are also very linked to the components: MMICs are always the key components, with evolutions towards multifunction chips, new processes like GaN, SiGe, MEMS power switches. The technical innovation is the use of SiGe front end chips to benefit both frequency performance and integration power offered by such a technology.

All these technologies mastered by Thales are dual for Airborne and Space, Military and Civilian applications.

12:30
End of Session
<table>
<thead>
<tr>
<th>Time</th>
<th>EuMIC05-1: Highly Conductive Nitride Based Heterostructures for 5G Communications</th>
<th>EuMIC06-1: Non-linear CAD and Harmonic Balance Simulations of Track and Hold Amplifiers</th>
<th>EuMIC07-1: 100nm GaN on Si Technology for mmW 5G Application and SATCOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30 - 14:10</td>
<td>Kai Cheng¹</td>
<td>Abdinejed Stazoua¹, Ali Batlah¹, Guillaume Néeval¹, Denis Barataud¹, Cédric Chambon¹</td>
<td>Fabrizio Röbel¹, OMMIC SAS</td>
</tr>
<tr>
<td></td>
<td>United Monolithic Semiconductors SAS</td>
<td>*XLM Research Institute - UM CNRS 7252, Callisto Space</td>
<td></td>
</tr>
<tr>
<td>14:10 - 14:30</td>
<td>EuMIC05-2: High-speed Linear GaN Technology with a Record Efficiency in Ka-band</td>
<td>EuMIC06-2: Time-Domain Analysis of RF and Microwave Autonomous Circuits by Vector Fitting-Based Approach</td>
<td>EuMIC07-2: A 35-39 GHz CMOS Linearized Receiver with 2 dBm IIP3 and 16.8 dBm OIP3 for the 5G Systems</td>
</tr>
<tr>
<td></td>
<td>Kenjiro Koizumi¹, Jong-Won Song¹, Bob Gruber¹, Michael Antolfini¹, Erdum Akku¹, A Corton¹, Peter Chen¹, Khalili¹</td>
<td>Leonardo Pantalei¹, Domenico Spinola¹, Daniele Romani¹, Giule Antonini¹, Giorgio Lazzari¹, Tom Chiane¹</td>
<td>Chien-Nan Chen¹, Ying Chen¹, Tai-Yu Kuo¹, Hwei Wang¹, National Taiwan University</td>
</tr>
<tr>
<td></td>
<td>HRL Laboratories, LLC</td>
<td>*University of L'Aquila, University of Ghent-imec</td>
<td></td>
</tr>
<tr>
<td>14:30 - 14:50</td>
<td>EuMIC05-3: Thermal Performances of Industrial 0.25-µm GaN Technology for Space Applications</td>
<td>EuMIC06-3: GaN FET Load-Pull Data in Circuit Simulators: a Comparative Study</td>
<td>EuMIC07-3: A High-Speed Millimeter-Wave QPSK Transmitter in 28 nm CMOS FD-SOI for Polymer Microwave Fibers Applications</td>
</tr>
<tr>
<td></td>
<td>Samrina Diad¹, Charles Teyssandier¹, Christophe Cheng¹, Bruno Laurent¹, Valeria Brunel¹, Didier Floir¹, Hermann Steigler¹, Herve Bando¹, Anne-Marie Cautelier¹</td>
<td>Gustavo Avoli¹, Antonio Raffín¹, Giorgio Vannini¹</td>
<td>Florian Vanezis¹, Baoudouin Martinez¹, Mathilde Sél¹, Anthony Ghozzi¹, Eric Kheherul¹</td>
</tr>
<tr>
<td></td>
<td>*United Monolithic Semiconductors SAS</td>
<td>*Antwerp IM/Maury Microwave, University of Ferrara</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matthew Gudry¹, Shan Romanczyk¹, Hassan Li¹, Elahet Ahmad¹, Steven Wenzlick¹, Chun Zheng¹, Stacia Keller¹, Umesh Mishra¹</td>
<td>Simona Donati Guerrieri¹, Fabrizio Bonani¹, Giovanni Ghione¹</td>
<td>Muhammad Furqan¹, Faisal Ahmed¹, Andreas Salesz¹</td>
</tr>
<tr>
<td></td>
<td>*UCSB</td>
<td>*Politecnico di Torino</td>
<td></td>
</tr>
<tr>
<td>15:10 - 15:30</td>
<td>EuMIC05-5: Study of Thick Copper Metallization with WNx as Diffusion Barrier for AlGaN/GaN HEMTs</td>
<td>EuMIC06-5: Reduced-Cost Gradient-Based Optimization of Compact Impedance Matching Transformers in Highly-Dimensional Parameters Spaces</td>
<td>EuMIC07-5: A Fully Integrated 30-to-160GHz Coherent Detector with a Broadband Frequency Comb in 65nm CMOS</td>
</tr>
<tr>
<td></td>
<td>Y. C. Lin¹, Ming-Wen Lee¹</td>
<td>Slawomir Koziel¹, Anna Pietenko-Dobrowska¹</td>
<td>Babak Jamali¹, Aydin Babakhani¹</td>
</tr>
<tr>
<td></td>
<td>NTU</td>
<td>*Benjamin University, *Gdansk University</td>
<td></td>
</tr>
</tbody>
</table>
MONDAY

EuMIC 2019

N01

EuMIC08
Advanced Solutions for Integrated Power Amplifiers
Chair: Eric Kerhervé¹
Co-Chair: Patrick Schuh²
¹University of Bordeaux, Bordeaux INP, UMR CNRS 5218, IMS Laboratory, ²Hensoldt

EuMIC09
Modelling and Extraction Techniques
Chair: Roberto Guadagno¹
Co-Chair: Justin King²
¹Cardiff University, ²Trinity College Dublin

EuMIC10
mm-wave Transceiver Components
Chair: Jonas Hanbury³
Co-Chair: Michael Schlechtweg²
³Ericsson AB, ²Fraunhofer Institute for Solid State Physics IAF

16:10 - 16:30

EuMIC08-1
Ka to W Band GaN/Si CW Power Amplifiers
Rémy Lelânc⁴
⁴OMMIC SAS

EuMIC09-1
Energy-based Capacitance Modeling for Field-effect Transistor Stability Analysis
Mateo Schmidt-Szalowski²
²Ampleon

EuMIC10-1
Compact and Performing Transmission Lines for Mm-wave Circuits Design in Advanced CMOS Technology
Giuseppe Azzi², Luigi Bosco¹, Nicolas Correa³, Florence Podesta¹, Emmanuel Piatón¹, Telfrey Lin², Erik Nevels³, Philippe Ferrari³
¹NPG, RFCIC-Lab, University of Calabria, ²Univ. Grenoble Alpes, ³IMEP-LAHC Grenoble, ⁴Fraunhofer Institute

16:30 - 16:50

EuMIC08-2
A Broadband Continuous Class-F GaN MMIC PA Using Multi-Resonance Matching Network
Gholamreza Nikandish¹, Robert Bogdan Staszewski², André Zhu²
¹University College Dublin

EuMIC09-2
HEMT Small-Signal Modelling for Voltage-Controlled Attenuator Applications
Yuan Tao¹
¹University of Electronic Science and Technology of China

EuMIC10-2
Full Waveguide E- and W-Band Fundamental VCOs in SiGe:C Technology for Next Generation FMCW Radars Sensors
Christian Bredendiek¹, Klaus Auinger¹, Nikola Pohl²
¹ Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, ² Fraunhofer Institute

16:50 - 17:10

EuMIC08-3
A 5 to 18GHz, 10 W GaN Power Amplifier Using Non-distributed Approach
Simplice Gongo¹, Yoganand Varma², Suman K², Uswala G², Pramod Singh², Jyothi Ch²
¹Aelius Semiconductors Pte Ltd, ²Astra Microwave Products Limited

EuMIC09-3
Intrinsic Capacitance Extraction from Pulsed S-parameters
Claire Wilson¹, Justin King²
¹University College Dublin, ²Trinity College Dublin

EuMIC10-3
An Inductorless 60 GHz Down-Conversion Mixer in 22 nm FD-SOI CMOS Technology
Paolo Valerio Testa¹, Vincent Redon², Conrado Carta³, Frank Ellinger¹
¹TU Dresden

17:10 - 17:30

EuMIC08-4
A High Gain Ka-Band Asymmetrical GaAs Doherty Power Amplifier MMIC for 5G Applications
Ahmet Degirmenci¹, Ahmet Aktuğ¹
¹Aselsan Inc.

EuMIC09-4
MOM Capacitance Characterization in G-Band using On-wafer 3D-TRL Calibration
Aldefahin A. Saad³
³NPG, RFCIC-Lab

EuMIC10-4
A 20.7% PAE 3-Stage 60 GHz Power Amplifier for Radar Applications in 28 nm Bulk CMOS
Radu Ciocoveanu¹, Robert Wegener³, Ariele Hagglum², Vadim Issakov³
¹Infineon Technologies AG, ²Friedrich-Alexander University Erlangen-Nürnberg (FAU), ³Infineon Technologies AG

17:30 - 17:50

EuMIC08-5
An Area Efficient 48 - 62 GHz Stacked Power Amplifier in 22 nm FD-SOI
Mengqi Cui¹, Zoltán Tibenszky¹, David Fritsche¹, Corrado Carta¹, Frank Ellinger¹
¹Technische Universität Dresden

EuMIC09-5
Effective Resistivity Extraction of Low-Loss Silicon Substrate at Millimeter-Wave Frequencies
Lucas Mystèn, Martin Rück¹, Jean-Pierre Rekkin¹
¹Université catholique de Louvain

EuMIC10-5
A 2-38 GHz Linear GaAs pHEMT TIA for a Quasi- Coherent Optical Receiver
Guillermo Silva Valdecasa¹,², Jesper Beenker Jensen¹, Martin Dökle¹, Tom Keenleyside¹,²
¹Department of Electrical Engineering, Technical University of Denmark, ²Bifrost Communications ApS, ³NIKEMI Engineering

www.eumweek.com | 35
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenter(s)</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>EuMC/EuMIC01</td>
<td>Low-Noise amplifiers</td>
<td>François Deborgies¹, Amparo Herrera Guardado³</td>
<td>ESA-ESTEC, University of Cantabria</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chair: François Deborgies¹, Co-Chair: Amparo Herrera Guardado³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:00</td>
<td>EuMC/EuMIC11</td>
<td>ICs Beyond 100 GHz</td>
<td>Christian Fager¹, Vadim Isakov⁴</td>
<td>Chalmers University of Technology, Infineon Technologies AG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chair: Christian Fager¹, Co-Chair: Vadim Isakov⁴</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:30</td>
<td>EuMC/EuMIC02</td>
<td>Photonic-Electronic Devices</td>
<td>Marion K. Matters-Kammerer¹, Franco Giannini²</td>
<td>Eindhoven University of Technology, University of Rome Tor Vergata</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chair: Marion K. Matters-Kammerer¹, Co-Chair: Franco Giannini²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:30</td>
<td>EuMC/EuMIC01-1</td>
<td>New frontier for RF GaN Technologies applied to SIP product</td>
<td>Didier Floriot¹</td>
<td>United Monolithic Semiconductors SAS</td>
</tr>
<tr>
<td>09:00</td>
<td>EuMC/EuMIC11-1</td>
<td>A 18-dBm G-band Power Amplifier using 130-nm SiGe BiCMOS Technology</td>
<td>Abdul Kafi²</td>
<td>University of Rome Tor Vergata</td>
</tr>
<tr>
<td>09:30</td>
<td>EuMC/EuMIC02-1</td>
<td>THz Optoelectronic Systems: Trends and Potential</td>
<td>Robin Creutz²</td>
<td>LUZ WAVE Lab</td>
</tr>
<tr>
<td>08:30</td>
<td>EuMC/EuMIC01-2</td>
<td>Limiting the Output Power of Rugged GaN LNAs</td>
<td>Zineb Ouarch Provost¹, Laurent Cavallé, Marc Camnade³, Maxime Olivier³, David Lecoeur³, Clement Tolan², Michel Stanislavskii³</td>
<td>United Monolithic Semiconductors, Thales LAS</td>
</tr>
<tr>
<td>09:00</td>
<td>EuMC/EuMIC11-2</td>
<td>A Broadband Antenna-Coupled Terahertz Direct Detector in a 0.13-μm SiGe HBT Technology</td>
<td>Nadal Andre³, Janusz Góźdź, Rózsa Jan³, Bernd Heinemann³, Ulfrik R. Pfeiffer³</td>
<td>University of Wuppertal</td>
</tr>
<tr>
<td>09:30</td>
<td>EuMC/EuMIC02-2</td>
<td>Photonics-based Compact Broadband Transmitter Module for E-band Wireless Communications</td>
<td>Mihir Agarwal⁴, Christopher Jankowski⁵, Robin Cruse Cushnir⁴, Luis Enrique García-Muñoz⁴, Federico van Dijk⁴, Guillermo Carpioti⁴</td>
<td>University Carlos III de Madrid, 18-V Lab</td>
</tr>
<tr>
<td>08:30</td>
<td>EuMC/EuMIC01-3</td>
<td>High Robustness S-Band GaN Based LNA</td>
<td>Ewyrene Kutzer¹, Cristina Andre³, Stefan Gerlich⁴, Ralf Doemer⁵, Matthias Rudolph⁵</td>
<td>Brandenburg University of Technology, Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik</td>
</tr>
<tr>
<td>09:00</td>
<td>EuMC/EuMIC11-3</td>
<td>A 180-GHz Passive Integrated SiGe Down-Conversion Mixer with Low Loss and a Broadband Rat-Race Coupler Design</td>
<td>Håkan Qahir³, David Frischke³, Mohammed El-Shenaway³, Paul Stårke³, Comaldo Carlu³</td>
<td>TU Dresden</td>
</tr>
<tr>
<td>09:30</td>
<td>EuMC/EuMIC02-3</td>
<td>Broadband Continuously Tuneable Delay Microwave Photonic Beamformer for Phased Array Antennas</td>
<td>Robert Grootjans¹, Chris Roselkenn⁵, Caterina Taddé⁵, Michel Hoevers⁵, René van Veenendaal⁵, Paul Koper⁵, Dennis Geskus⁵, Andrea Algo⁵, Rosebud Dekker⁵, Ruud Oldenhuis⁵, Jan Epping⁵, Roderick Bernardus Timmers⁵, Rick Heising⁵, Edwin Klier⁵, Arne Lievens⁵, Paul van Dijk⁵, René Heideman⁵</td>
<td>LioniX International BV, PHIX Photonics Assembly</td>
</tr>
<tr>
<td>08:30</td>
<td>EuMC/EuMIC01-4</td>
<td>A 23-31 GHz Robust Low-Noise Amplifier with 1.1 dB Noise Figure and 28 dBm Psat</td>
<td>Penghu Zheng³, Shijie Zhang³, Jiaming Xu³, Rong Wang³, Xiaodong Tong³</td>
<td>National Institute of Science and Technology, China Academy of Engineering Physics</td>
</tr>
<tr>
<td>09:00</td>
<td>EuMC/EuMIC11-4</td>
<td>An Integrated mm-Wave Quadrature Up-Conversion Mixer Based on a Six-Port Modulator</td>
<td>Vincenzo Nesi³, Paul Stårke³, Conrado Carlu³, Frank Ellinger³</td>
<td>Technische Universität Dresden</td>
</tr>
<tr>
<td>09:30</td>
<td>EuMC/EuMIC02-4</td>
<td>300-GHz-band Wireless Communication Using a Low Phase Noise Photonic Source</td>
<td>Li Yifang¹, Katalevand³, Takami Yamamoto³, Fumiya Aoyama³, Yian Li³, Antoine Rolland³, Nayou Koo³, Martin Ferner², Tadashi Nagatsuma², Satoshi Hara³</td>
<td>Osaka University, ¹Behavior University, ²NASA America inc</td>
</tr>
<tr>
<td>08:30</td>
<td>EuMC/EuMIC01-5</td>
<td>A 28-60 GHz SiGe HBT LNA with 2.4-3.4 dB Noise Figure</td>
<td>jubal Gauvin¹, John Albrecht¹, John Papyiopoulos³, Ahmed Ulassy³</td>
<td>Michigan State University, Karenhoeve Institute of Technology (KIT)</td>
</tr>
<tr>
<td>09:00</td>
<td>EuMC/EuMIC11-5</td>
<td>A 300 GHz Active Frequency Tripler in Transferred-Substrate InP DHB Technology</td>
<td>Tom Kaijitsch⁴, Johannes¹, Marc Heeske², Sebastian Bopper², Ralf Doemer², Viktor Krazer², Wolfgang Heinrich²</td>
<td>Technical University of Denmark, Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik</td>
</tr>
<tr>
<td>09:30</td>
<td>EuMC/EuMIC02-5</td>
<td>Pulsed Photocative Connected Slot Array Operating at the Sub-mm Wavelength Band</td>
<td>Paulo Dias¹, Paola Serafí, Giorgio Carlucci², Joshua Freeman¹, David Bacon³, Tadashi Nagatsuma³, Installation Ltd², Alexander Davies³, Ivan Lager³, Niklas Larsson⁴, Arne Net⁵</td>
<td>TNO Defense, Safety and Security, Caltech University of Technology, University of Leeds, ¹Netherlands Institute for Space Research (SRON)</td>
</tr>
</tbody>
</table>

36 | www.eumweek.com
### EuMC01 - Passive Devices - Theory and Applications
**Chair:** Florence Podevin¹  
**Co-Chair:** Anthony Ghiotto²  
¹RFIC Lab, Bordeaux INP, IMS Laboratory

#### EuMC01-1  
**Title:** Passive Ferrite Devices: Original Designs and New Challenges for the Future’s Applications  
**Authors:** Hamza Turki

#### EuMC01-2  
**Title:** Self-Heating Study on a First Order Filter with Discrete and Continuous Tuning  
**Authors:** Miguel Sanchez-Solano¹, Raizen Allanc¹, Vincent Le Sauf, Hassan Bouazzaouaz, Alexandre Mancheret, Cédric Quendo²  
¹University of Paris-Saclay, ²Lab-STICC-Université de Bretagne Occidentale, ENSTA-Bretagne, “Ellipijka” (STC)

#### EuMC01-3  
**Title:** Broadband Phase Control in Frequency and Time Domains: Design of True Delay-Lines for Noise-Decorrelation in Sensor-Arrays  
**Authors:** Sidina Niane, Davinee Bajon²  
¹Davinee Technologies, ²Lab-STICC-Université de Bretagne Occidentale, ENSTA-Bretagne, “Ellipijka” (STC)

#### EuMC01-4  
**Title:** Modal Analysis and Same-Bandedge Response Optimization of 3-D Lumped Networks  
**Authors:** Yelei Yao¹, Mustafa S. Baler, Ian Hunter¹  
¹University of Leeds, Leeds, United Kingdom, ²University of Electronic Science and Technology of China

#### EuMC01-5  
**Title:** Arbitrary Terminated Negative Group Delay Circuit with Constant Signal Attenuation and Its Application to Absorptive Bandstop Filter  
**Authors:** Girdhari Chaudhary, Qiang Li, Jungsik Lim, Yonglee Jeong¹  
¹Chonbuk National University, ²Soonchunhyang University

### EuMC02 - High Directivity Antennas
**Chair:** Diego Mascoti²  
**Co-Chair:** Martino Airdaghi²  
²University of Bologna, “IMT”

#### EuMC02-1  
**Title:** From Antenna Measurement to 5G OTA – a Paradigm Shift  
**Authors:** Benoit Derat¹  
¹Rohde & Schwarz GmbH & Co. KG

#### EuMC02-2  
**Title:** Analysis and Design of Arrays with Tilted Directive Dipole Elements  
**Authors:** Cristina Yepes¹,² Erio Gandini², Stefania Monni², Frank E. van Vliet², Andrea Neto¹, Daniele Cavallini¹  
¹Delft University of Technology, ²TNO Defense, Safety and Security

#### EuMC02-3  
**Title:** Dual-polarized Leaky Wave Antenna with Low Cross-polarization Based on the Mode Composite Ridged Waveguide  
**Authors:** Yichun Gao, Xian Li, Yong Fan, Yunlong Lu, Guoming Xu  
¹University of Electronic Science and Technology of China, ²Ningbo University

#### EuMC02-4  
**Title:** Substrate-Superstrate Leaky-Wave Antenna with Interleaved Metasurfaces for Directivity Improvement  
**Authors:** Sivak Todi, Walter Furstad, Paolo Burghignoli, Paolo Baccarelli, Alessandro Galli  
¹Sapienza University, ²Roma Tre University

#### EuMC02-5  
**Title:** A High Directivity Beam-Steering Parasitic Antenna Array  
**Authors:** Husnain Ali Kayani¹, Christophe Craey¹  
¹Université catholique de Louvain
EuMIC12
EuMIC Interactive Session 1
Chair: Jean-Christophe Nallatamby¹
Co-Chair: Joaquín Portilla²
¹XLIM Research Institute - UMR CNRS 7252, ²UPV/EHU

08:30 – 10:10

TUESDAY

Exhibition Hall

EuMIC12-1
10W Ka Band GaN MMIC amplifier embedded in Metal Ceramic Package
Laurent Marchand¹, André Desi¹, Thibauld Hue², Elodie Richard³, Vincentique Seru¹, Marc Carrié¹, Christophe Chang¹, Gregory Mouchoff¹, Bertrand Gerfault¹, Guillaume Le Rhu²
¹United Monolithic Semiconductors, ²THALES AVS / MIS

EuMIC12-2
Experimental Analysis of In-package Harmonic Manipulations with a 160 W GaN HEMT Power Bar
Omeran Ceylan¹, Ali Ila², Yi Zhu¹, Sergio Pire³
¹Ampleon Netherlands BV

EuMIC12-3
Comparative Noise Investigation of High-Performance GaAs and GaN Millimeter-wave Monolithic Technologies
Walter Cicognani¹, Sergio Colangeli¹, Antonio Serino¹, Lorenzo Piana¹, Silvio Fenu¹, Patrick Longhi¹, Ernesto Limiti¹, Julien Pouil¹, Rémy Letilliard¹
¹University of Roma Tor Vergata, ²OMMIC SAS

EuMIC12-4
Increased RF-Losses at the GaN/Si Interface after Eutectic Die Attach
Korbinian Reiser¹,², John Twynam¹, Helmut Brecht¹, Shyam Hardikar¹, Robert Weigel¹,²
¹Infineon Technologies AG, ²Institute for Electronics Engineering, Friedrich-Alexander-Universität Erlangen-Nürnberg

EuMIC12-5
Systematic Experimental F0 and fmax Comparison of 40-nm Bulk CMOS versus 45-nm SOI Technology
Johannes Rinnhubsch¹,², Andreas Werhof¹, Robert Weigel¹, Vadim Isaakov¹
¹University of Erlangen-Nürnberg, ²Infineon Technologies AG

EuMIC12-6
Study of Enhancement-Mode Tri-Gate InAs HEMTs for Low Noise Application
Y. C. Lin¹, Chun Wang¹
¹NTCU

EuMIC12-7
Radio Frequency Graphene Transistor, High Yield Process and Good Stability Under Strain
Wei Wei¹, Soukaina Ben-Salk¹, Theo Levert¹, Oihana Txoperena², Emiliano Palacios¹, Henri Happy¹
¹Institute of Electronics, Microelectronics and Nanotechnology, ²graphenea

EuMIC12-8
A 0.41 mW Band-Tunable 6th-Order IF Filter with 40 ns Settling Time in 45 nm CMOS RFSoI
Rui Mu¹, Zoltán Tibenszky¹, Martin Kreßig¹, Frank Ellinger¹
¹Technische Universität Dresden

EuMIC12-9
HCI-Proof Ultra-Broadband Millimeter-Wave Amplifier for Automotive Radar
Ndumiso Hlotse³, Shiya Kohimoto¹, Shinji Yamaura¹
¹DENSO CORPORATION

EuMIC12-10
A Digital Adjustable Fully Integrated Bistatic Interferometric Radar Transceiver at 60 GHz in a 130 nm BiCMOS Technology
Mathias Völker¹, Marco Dietz¹, Amelie Hagedoorn¹, Essa Mohamed Huaisen¹, Dietmar Kasinger¹, Robert Weigel¹
¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), ²IMP - Leibniz Institut für innovative Mikrotechnik, ³Uni University

EuMIC12-11
A Low Power Wideband V-band LNA Using Double-Transformer Coupling Technique and T-type Matching in 90 nm CMOS
Yu-Teng Chang¹, Tai-Yi Lin¹, Hsin-Chia Lu¹
¹National Taiwan University

EuMIC12-12
A GaN MMIC HPA with 50W Output Power and 50% PAE for S-Band Radar Systems
Rico Giolfi¹, Ferdinando Costanzo¹, Manuela Suliga¹, Maurizio Cirillo¹, Ernesto Limiti¹
¹University of Rome Tor Vergata, ²Rheinmetall Italy

EuMIC12-13
100 W High Power Amplifier MMIC in 0.45 µm GaN Technology
Pramod Singh¹,²
¹Astra Microwave-Products Limited, ²Nelus Semiconductors Pvt Ltd

EuMIC12-14
A 18-40GHz 10W GaN Power Amplifier MMIC Utilizing Combination of the Distributed and Reactive Matching Topology
Chenghsiao Hsu¹
¹Nanjing Electronic Devices Institute
EuMW01
EuMW/EuMC Opening Session
Chair: Denis Barataud, EuMW 2019 General Chair
Co-Chair: Stephane Bila, EuMC 2019 Chair
¹XLIM UMR7252, Université of Limoges/CNRS, Limoges, France

10:50 - 11:00
Welcome Address

Opening of the European Microwave Week 2019
Denis Barataud, EuMW 2019 General Chair

11:00 - 11:05
EuMA Welcome Address
Frank Van Den Bogaart, EuMA President

11:05 – 11:10
Greetings from IEEE MTT-S
Dominique Schreurs, IEEE MTT-S President

11:10 – 11:15
Opening of the European Microwave Conference 2019
Stephane Bila, EuMC 2019 Chair

11:15 – 11:25
Greetings from EuMW 2019 Platinum Sponsor
Benoit Neel, Vice President and General Manager for Keysight EMEA

11:25 – 11:55
1969 – 2019: Souvenir of 50 years of Microwave Conferences
The first EuMC conference took place in London in 1969. We wanted, through a first presentation, to go back over these 50 years of European microwave conferences thanks to retrospectives on microwave circuits and radar. Pr. André Vander Vorst will tell the story of the inaugural organization of the first edition of this European Microwave Conference in London. Then, Pr. Roberto Sorrentino will offer a selective retrospective on microwave circuits since 1969. Finally, because EuRAD did not exist but radar was already an important topic for the microwave research community, Pr. Leo Ligthart will present a selective retrospective on radar.

11:55 – 12:25
Beyond 100GHz transport technology and applications
Paolo Di Prisco, Wireless Transport Product Strategy leader from NOKIA
The shift towards higher spectrum bands for mobile backhaul to provide large and unused spectrum is well aligned to future 5G capacity requirements and densification targets, in order to satisfy the ultra-dense network scenario. R&F and antenna technology evolution are demonstrating breakthrough results, both in terms of performance and form factor which are key for the wireless transport success in this area to achieve fiber-like capacity. Such evolution will offer unique opportunity to enlarge the applicability of spectrum beyond 100GHz not only to x-Haul but also to enterprise, smart cities and industrial applications.

12:25 – 12:45
Awards Ceremony
Andy Gibson, Chair EuMA Awards Committee

EuMA Pioneer Award
EuMA Distinguished Service Award
Certificate of Recognition for EuMW 2018 General Chair
International Journal for Microwave and Wireless Technologies Best Paper Prize

12:45
End of Session
### EuMC/EuMIC03-1
**Challenges & Solutions of High Frequency and High Output Power GaN-based SSPAs**

**Jose Nina Aguiar³**

"TI Norte"

### EuMC/EuMIC03-2
**10W Ka Band MMIC Power Amplifiers based on InAlGaN/GaN HEMT Technology**

**Clément Poiré¹, Stéphane Potiowicz¹, Christophe Chang¹, Olivier Patard¹, Linh Thanh Vu¹, Jan Gruenerquelle¹, Piero Gamara¹, Philippe Allurant¹, Eric Charlet¹, Jean-Claude Jacquod², Cédric Lacram¹, Nicolas Michel¹, Christian Dui¹, Mousad Ouali¹, Sylvain L. Dege²**

"TY Labs, Nokia Bell Labs, Thales, CEATel, - IMASAS"

### EuMC/EuMIC03-3
**3.6 GHz Integrated Inverse Class-E Amplifier with Polar Modulation Capability**

**Andres Sedler¹, Albrecht Gündel², Martin Kreißig¹, Paul Stärke¹, Martin Morgenstern¹, Paul Stärke¹, Frank Ellinger¹**

"Technische Universität Dresden, - Infineon Technologies"

### EuMC/EuMIC03-4
**Quasi Inverse Class-F X-Band Highly Efficient Power Amplifier with 51.8% Peak PAE in SiGe**

**Samuel Redois¹, Eric Kerhervé², Anthony Ghiotto², Bruno Louis³, Yves Margus³, Vincent Pett³**

"University of Bordeaux, IMS laboratory, - Thales Defence Mission Systems (TDMS)"

### EuMC/EuMIC03-5
**Low Phase Noise Digital Frequency Divisions of a 30 GHz Coupled Optoelectronic Oscillator**

**Amiru Coller¹, Olivier Lloia¹, Gilles Clénet¹, Eric Tourrière¹**

"LAAS-CNRS, - CNES"

### EuMC/EuMIC04-1
**A Compact and Broadband Phase Shifter with Bridged-T Circuit Topology**

**Ryota Hanga¹, Naotake Komas¹, Tawo Mohros¹, Shintaro Shinjo¹, - Mitsubishi Electric Corporation**

### EuMC/EuMIC04-2
**A 0.5 THz Signal Source with -11 dBm Peak Output Power Based on InP DHBT**

**Maruf Hossain¹, Nils Weimann¹, Mohamed Brahem¹, Olivier J. O. S. Ostinelli³, Colombo Bolognesi³, Wolfgang Heinrich¹, Viktor Krozer¹**

"Ferdinand-Braun-Institut (FBH) Leibniz-Institut für Höchstfrequenztechnik, - University of Duisburg-Essen, Duisburg, Germany, - ETH Zürich"

### EuMC/EuMIC04-3
**A 115-185 GHz 75-115 mW High-Gain PA MMIC in 250-nm InP HBT**

**Zach Griffith¹, Miguel Urteaga¹, Petra Rowell¹**

"Teledyne Scientific and Imaging"

### EuMC/EuMIC04-4
**High Data Rate W-Band Balanced Schottky Diode Envelope Detector for Broadband Communications**

**Angel Blanco Granja¹, Dimitrios Konstantinou², Simon Rommers¹, Bruno Cimoli², Sebastian Rodriguez³, Wolfgang Heinrich¹, Viktor Krozer¹**

"Technische Universität Darmstadt, - Eindhoven University of Technology - TU, - Technical University of Denmark, - Mittelhessen University of Applied Sciences"

### EuMC/EuMIC04-5
**A 2-12 GHz High-Power GaN MMIC Switch Utilizing Stacked-FET Circuit**

**Masatake Hanga¹, Ryota Komas¹, Shintaro Shinjo¹**

"Mitsubishi Electric Corporation"

### EuMC/EuMIC05-1
**A Novel Wide-Band Finger-Shaped Phase Shifter on Silicon-On-绝缘体 (SOI) Technology for Sub-Millimeter Wave and Terahertz Applications**

**Aidin Taeb¹, Suren Gignyan², Mohamed El-Ghara², Suwed Chauhan³, Safedrin Safavi-Naeini⁴**

"University of Waterloo"
TUESDAY

**EuMC03**
Battery-Less Circuits for Emerging Technologies
Chair: Nuno Borges Carvalho¹
Co-Chair: Diego Mascotti²
¹Instituto de Telecomunicações, DSET, Universidade de Aveiro, ²University of Bologna

**EuMC04**
Non-Planar Filters I
Chair: Giuseppe Macchiarola¹
Co-Chair: Simone Bastioli²
¹Politecnico di Milano, ²RS Microwave

**EuMC05**
Novel Antenna Materials
Chair: Ioan Lager¹
Co-Chair: Józef Modelski²
¹Delft University of Technology, ²Warsaw University of Technology

**EuMC03-1**
Fly by Wireless
Rhyi Phillips¹
¹Airbus Defence & Space

**EuMC04-1**
The Evolution of Mobile Networks Architectures and its Effects on Antenna Line Filter Products
Giuseppe Resnati¹
¹COMMSCOPE

**EuMC05-1**
Viability of using Additive Manufacturing for Horn Antennas Fed with Empty Substrate Integrated Waveguide
Juan Angel Martinez¹, Jose Vicente Morro², Hector Estebanez³, Angel Belenguer³, Juan José De Dios¹, Vicente E. Borja¹
¹Universidad de Castilla-La Mancha, ²Universitat Politècnica de València

**EuMC04-2**
Vertical Feeding Section with a Band-Rejection Filtering Function for a Low-Profile Antenna
Motomi Abe¹, Tomohiro Takahashi¹, Masataka Otsuka¹, Toshi Takagishi¹, Naofumi Yoneda¹
¹Mitsubishi Electric Corporation

**EuMC05-2**
Thin Perforated A-shaped DRA for UWB Applications
Abdulaziz Alali¹, Farnoush Sabouni², Abas Sabouni¹, Ahmed Kishk³
¹Wilkes University, ²Azad University, ³Concordia University

**EuMC03-2**
Millimetre-Wave Interrogation of Passive Sensors Embedded Inside Closed Reverberant Environments from Dual-Polarized Passive Repeaters
Machtul Timofiriev, Julien-Philippe Dominique Henry¹, Maria Valeria De Paolis², Anthony Coustou², Patrick Pons¹, Henri-Aubert¹
¹LAS-EPNS

**EuMC04-3**
Easy-to-Fabricate Embedded Negative Coupling Structure for Post-Loaded Dielectric Resonator Filter
Sang gi Lee¹, Seunggiyo Nam¹, Boyoung Lee¹, Juseop Lee¹
¹Korea University

**EuMC05-3**
Miniaturized Antenna on a Paper Substrate
Edua Vandele¹, Gustavo Ardila¹, Simon Hemour², Ke Wu¹, Tam-Phu Vuong²
¹IMEP-LAHC Grenoble, ²IMS Bordeaux, ³Ecole Polytechnique de Montreal

**EuMC03-3**
Graphene diodes for 5G energy harvesting: design, simulations and experiments
Martina Aldi², Mosca Dragoman², Sergiu Iordanescu², Dan Vasilescu², Adrian Dinescu³, Mihai Sharanawan³, Diego Mascotti³
¹IMT, ²University of Bologna

**EuMC04-4**
Ku-Band Waveguide Filter with Multiple Transmission Zeros by Resonant Source to Load and Bypass Cross-Coupling
Daniel Miek¹, Ana Morán López², Jorge A. Ruiz-Cruz², Michael Höft¹
¹Christian-Albrechts-Universität zu Kiel, ²Universidad Autónoma de Madrid

**EuMC05-4**
Graphene Nanoflakes Printed Dual-band CPW Fed Monopole Antenna for WLAN Applications
Ting Leng¹, Keven Fan¹, Yutong Jang¹, David Zhang¹, Zhun Hu¹
¹University of Manchester

**EuMC03-4**
A Single Cell Dual Band Rectifier at Millimeter-Wave Frequencies for Future 5G Communications
Arian Razi, Muhammad Musab Farooq¹, Waed Tanveer Khan¹
¹Lahore University of Management Sciences

**EuMC04-5**
Graphene Nanoflakes Printed Dual-band CPW Fed Monopole Antenna for WLAN Applications
Ting Leng¹, Keven Fan¹, Yutong Jang¹, David Zhang¹, Zhun Hu¹
¹University of Manchester

**EuMC03-5**
A 2.45 GHz Signal Detector Based on Zero Biasing Field Effect Transistor
Ahmed Moulay¹, Esam Shafah¹
¹Institut National de la Recherche Scientifique (INRS)

**EuMC04-5**
Compact On-board L-band Dielectric-loaded Diplexer for High-power Applications
Lucia Pellici¹, Fabrizia Cacciamani¹, Alessandro Cuzzotta¹, Davide Trissino¹, Paolo Vallorontdla, Roberto Somerlini¹, Walter Staffa², Francesco Vitali², Elia Pochiarea², Jaione Gañande², Feloniko Martin Iglesias³
¹IRF Microtech Srl, ²Thales Alenia Space Italia, ³ESA ESTEC

**EuMC05-5**
Determination of Effective Dielectric Constant and Resonant Frequency of Microstrip Patch Antenna with Multilayered Superstrate Structures
Dinesh Ranu¹, Mohammad Hashmi¹
¹IIT Delhi
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>EuMC/EuMIC06-1</td>
<td>Tune-All Substrate-Integrated-Waveguide (SIW) Bandpass Filters</td>
</tr>
<tr>
<td></td>
<td>Martin Deng¹, Dimitra Psychogiou¹</td>
</tr>
<tr>
<td></td>
<td>University of Colorado Boulder</td>
</tr>
<tr>
<td>EuMC/EuMIC06-2</td>
<td>A Reconfigurable Array for Media Based Spatial Modulation</td>
</tr>
<tr>
<td></td>
<td>Anita Roy¹, Vinayak K J²</td>
</tr>
<tr>
<td></td>
<td>Indian Institute of Science</td>
</tr>
<tr>
<td>EuMC/EuMIC06-3</td>
<td>20-44 GHz Mismatch Tolerant Programmable Dynamic Range with Inherent CMRR Square Law Detector for AGC Applications</td>
</tr>
<tr>
<td></td>
<td>Ahmed Amer¹, Mohamed Abdalla², Islam Eshrah²</td>
</tr>
<tr>
<td></td>
<td>Analog Devices Inc, Faculty of Engineering, Cairo University</td>
</tr>
<tr>
<td>EuMC/EuMIC06-4</td>
<td>A Miniatured 28-GHz FEM using a 0.15-μm InGaAs/ GaAs E-mode pHEMT Process</td>
</tr>
<tr>
<td></td>
<td>Hui Dong Lee¹</td>
</tr>
<tr>
<td></td>
<td>Electronics and Telecommunications Research Institute</td>
</tr>
<tr>
<td>EuMC/EuMIC06-5</td>
<td>A Planar Single-ended Kilowatt-level VHF Class E Power Amplifier</td>
</tr>
<tr>
<td></td>
<td>Renbin Tong¹, Stefan Book¹, Long-Huang², Dragos Dancila¹</td>
</tr>
<tr>
<td></td>
<td>Uppsala University</td>
</tr>
<tr>
<td>EuMC/EuMIC06-6</td>
<td>4096-QAM Microwave Transmitter Providing Efficiency Exceeding 50% and EVM Below 1%</td>
</tr>
<tr>
<td></td>
<td>Earl McCune¹, Quentin Diduck¹</td>
</tr>
<tr>
<td></td>
<td>Eridan Communications</td>
</tr>
<tr>
<td>EuMC/EuMIC06-7</td>
<td>High-Reliability Active Integrated Power Limiter with Sharp Compression Profile in Ka-Band in 130 nm SiGe Technology</td>
</tr>
<tr>
<td></td>
<td>Manuel Poteau¹, Nathalie Delimpò¹, Anthony Ghadda¹, Olivier Jardet², Stéphane Rochette², Hervé Leblond², Jean-François Vilennez²</td>
</tr>
<tr>
<td></td>
<td>University of Bordeaux, IMS laboratory, Thales Alenia Space en France</td>
</tr>
<tr>
<td>EuMC/EuMIC06-8</td>
<td>Unified Feedback Beamforming Digital Predistorter</td>
</tr>
<tr>
<td></td>
<td>Suguru Habu¹, Yasushi Yamao¹, Hiroshi Suzuki¹</td>
</tr>
<tr>
<td></td>
<td>Advanced Wireless &amp; Communication Research Center, the University of Electro-Communications</td>
</tr>
<tr>
<td>EuMC/EuMIC06-9</td>
<td>Screening of Integrated GaAs Stacked-FET Power Amplifiers</td>
</tr>
<tr>
<td></td>
<td>Gij van der Heij¹, Peter de Heij¹, Frank E. van Vliet¹</td>
</tr>
<tr>
<td></td>
<td>&quot;TNO&quot;</td>
</tr>
<tr>
<td>EuMC/EuMIC06-10</td>
<td>Sub-THz On-chip Dielectric Resonator Antenna with Wideband Performance</td>
</tr>
<tr>
<td></td>
<td>Abdul Ali¹</td>
</tr>
<tr>
<td></td>
<td>University of Rome Tor Vergata</td>
</tr>
<tr>
<td>EuMC/EuMIC06-11</td>
<td>Simple Microwave Measurement System Using Bi-Directional Configuration of VCSEL and PD-TIA from 6 to 16 GHz</td>
</tr>
<tr>
<td></td>
<td>Satoru Kurokawa¹</td>
</tr>
<tr>
<td></td>
<td>National Institute of Advanced Industrial Science and Technology</td>
</tr>
</tbody>
</table>
16:10 – 16:50
Trends in Microwave Technologies for Space Application
Natanael Ayllon, European Space Agency, ESTEC

Microwave technologies are fundamental part in space missions of all kind spanning from telecommunication, earth observation, science, navigation to human spaceflight and robotic exploration. Among all, telecommunication is the domain using microwave technologies the most. The microwave equipment ranges from solid-state power amplifiers, travelling-wave tube amplifiers, frequency converters and signal generation subsystems and complex RF passive networks such as switch matrices, multipliers and complex input/output sections. Over the last decades, most of the efforts have been put on improving the performance (electrical, mechanical, thermal) to satisfy the ever increasing demand for data throughput, the issue being that both the non-recurring engineering costs as well as the recurring engineering cost of the equipment increased considerably for marginal improvement of performance. The same problem applies when going to higher frequencies i.e. beyond Ka-band. Nowadays, space-borne systems using Q/V-Bands are being developed; however, telecommunication operators are still reluctant to deploy such systems due to the inherent costs of the space segment and limited heritage. Moreover, the rapid evolution of the telecommunication market might not guarantee operators the recovery of the considerable initial investment. The talk will present the challenge ahead and will describe what are the current trends in telecommunication payloads and its associated RF equipment and technologies that are being considered to reduce the cost of the space segment while at the same time satisfy the demand from the user needs. Finally, the presentation will also highlight the ongoing development activities within the European Space Agency concerning MMC developments for various applications domains.

16:50 – 17:40
Foundry Session
Chair: Eric Leclerc, United Monolithic Semiconductors S.A.S

Several key representatives of RF and microwave semiconductor foundries will give short presentations of their foundry capabilities with respect to the impact of advanced GaN, GaAs and silicon technologies for military and Space, as well as civilian applications in sensing and communication. This includes details of current fully-released and commercially available processes and processes in development. There will also be an opportunity for questions and answers during this interactive forum.

17:40 – 17:50
Awards Ceremony
Eric Bergeault, EuMIC2019 Awards Coordination Chair.
Florence Podevin, EuMIC2019 Student Activities Coordination Chair
Nathalie Deltimple, EuMIC2019 General TPC Chair

EuMIC Microwave Prize
EuMIC Young Engineer Prizes
GaAS Association Address
GaAs Association Student Fellowships

17:50 – 18:10
Closing Remarks
Farid Medjdoub, EuMIC 2019 Chair

Invitation to EuMIC 2020 in Utrecht
François Debongies, EuMIC 2020 Chair

18:10
End of Session
TUESDAY

EuMC06
Applied Computational Electromagnetics
Chair: Hervé Aubert⁰
Co-Chair: Maurizio Bozzi⁰
LAAS-CNRS, University of Pavia

EuMC07
UHF, UWB and mmWave Techniques for Autonomous Sensors
Chair: Alessandra Costanzo⁰ Co-Chair: Giuseppina Monti⁰
University of Bologna, University of Salento

EuMC06-1
Filter and Multiplexer Design Under SIMULIA’s CST Studio Suite Environment
Carlos Vicente⁰
Aurora Software and Testing S. L. U. (CST/IDS)

EuMC07-1
Battery-less UWB Indoor Location Is The Way Forward For Industry 4.0
Jan Mennekens⁰
UWINLOC

EuMC06-2
Identification of Vulnerability within Front-Ends Chips using 60 GHz Near-Field Injection
Jeremy Raux⁰, Pierre Payet⁰, Laurent Chusseau⁰
YES - University of Montpellier

EuMC07-2
Robust Wireless Power Receiver for Multi-Tone Waveforms
Mahmoud Ouda⁰, Paul Mitcheson⁰, Bruno Clerckx⁰
Imperial College London

EuMC06-3
Modeling and Analysis for Ultra-wideband Single-Cell Sensing by a Coplanar Waveguide
Alessandra Paffi⁰, Micaela Libert⁰, Francesca Apanzon³, Xiao Ma³, Xiaolan Ou³, James C. Huang³
Sapienza University of Rome, Lehigh University

EuMC07-3
Miniaturized Millimeter Wave RFID Tag for Spatial Identification and Localization in Internet of Things Applications
Ajibayo Adeyeye⁰
Georgia Institute of Technology

EuMC06-4
Analysis of Combined Plasmon-Resonance and Photonic-Jet Effects in the THz Wave Scattering by Dielectric Rod with Graphene Strip
Sergii Dukhopelyuk⁰,²
Institute of Radio-Physics and Electronics NASU, V.N. Karazin Kharkiv National University

EuMC07-4
Modular and Reconfigurable Rectenna Unitcells with Beam-Forming Properties
Erkki Vardelle⁰, Tien-Phu Vuong⁰, Gustavo Ardila⁰, Ke Wu⁰, Simon Hemour⁰
IMPLA-CNRS Grenoble, Ecole polytechnique de Montréal, IMS Bordeaux

EuMC06-5
Optical Range Diffraction Radiation of Electron Beam in the Presence of Twin Circular Dielectric Nanowires
Daria Yontusherko⁰
Institute of Radio-Physics and Electronics NASU

EuMC07-5
An Attempt to Evaluate Potential Hydrogen in Soil Using AM Radio Waves for Agricultural Applications
Yabu Uchida⁰, Koisa Kumatani⁰, Tomoki Sakoizawa⁰, Futoshi Kuroki⁰, Masanori Eguchi⁰
National Institute of Technology, Kure College
## TUESDAY

### E05

#### EuMC08

**Dividers and Couplers**  
Chair: Richard Snyder¹  
Co-Chair: Rozenn Allanic²  
¹RS Microwave, ²LABSTICC-UBO

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Affiliations</th>
</tr>
</thead>
<tbody>
<tr>
<td>E08-1</td>
<td>Analytical Design of the Radial Power Divider With Wide Isolation Bandwidths</td>
<td>Ching-Wen Tang¹, Zhi-Hao Huang¹</td>
<td>National Chung Cheng University</td>
</tr>
<tr>
<td>E09-2</td>
<td>A Fully Differential Ultra-Broadband Power Divider with Integrated Resistors</td>
<td>Björn Deutschmann¹, Kevin Ekelien², Ame F. Jacob²</td>
<td>Hamburg University of Technology</td>
</tr>
<tr>
<td>E08-3</td>
<td>A Pi-Type Isolation Network for Improvement of Matching and Isolation in Reconfigurable Multifunctional Bandpass Filter</td>
<td>Xu Zhu¹</td>
<td>University of Electronic Science and Technology of China</td>
</tr>
<tr>
<td>E08-4</td>
<td>Wideband and Compact 3-D Quadrature Coupler for 5G Applications</td>
<td>Audrey Cayron¹, Christophe Villiot¹, Ayad Charram¹, Alessandro Magnani¹, Thierry Farsi¹</td>
<td>LAAS-CNRS, INSA Toulouse, Université de Toulouse Paul Sabatier, IDES Technologies</td>
</tr>
<tr>
<td>E08-5</td>
<td>A Compact Wideband Wilkinson Power Divider using Periodic Synthesized Transmission Line in Silicon IPD Process</td>
<td>Zhipeng Li¹, Liming Lv¹, Rong Zeng¹, Juncai Lu¹</td>
<td>China Academy of Engineering Physics</td>
</tr>
</tbody>
</table>

### E08

#### EuMC09

**Emerging Antenna Concepts**  
Chair: Ville Viikari¹  
Co-Chair: Stefan Lindenmeier²  
¹Aalto University, ²Institut für Hoch- und Höchstfrequentechnik der Universität der Bundeswehr München

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Affiliations</th>
</tr>
</thead>
<tbody>
<tr>
<td>E09-1</td>
<td>System for Multiplexed OAM Modes at 24 GHz</td>
<td>Christian Jimenez¹, Jerzy Kowalewski¹, Thomas Zwick¹</td>
<td>Karlsruhe Institute of Technology (KIT)</td>
</tr>
<tr>
<td>E09-2</td>
<td>Reflectarray with Mechanically Steerable Beam for DTH Application</td>
<td>Paolo Peroni¹, Thomas Lohrey¹, Massimo Chiara², Michele Becchi¹, Gianluca Dassano¹</td>
<td>DET-LACE, Politecnico di Torino, Eutelsat S.A., Paris, CNR-EIE</td>
</tr>
<tr>
<td>E09-3</td>
<td>Experimental Demonstration of a Dielectric Dome Antenna with Reduced Profile and Wide Scanning Capability</td>
<td>Erio Gandini¹, Fabrizio Silvestri¹, Alex Berrini¹, Giampaolo Girini¹, Enrica Marin¹, Stefano Mai², Maria Carolina Viganò¹, Giovanni Tos²</td>
<td>TNO, University of Siena, Viasat, ESA ESTEC</td>
</tr>
<tr>
<td>E09-4</td>
<td>Using UCA Techniques to Study OAM Modes Designed with Dipole Antennas at E-band</td>
<td>Le Fang¹, Rashuanda Henderson¹</td>
<td>The University of Texas at Dallas</td>
</tr>
<tr>
<td>E09-5</td>
<td>X-Band Slot Antenna Array In Air-Filled Substrate Integrated Waveguide</td>
<td>Homayoun Oraizi¹, Parinaz Hosseini¹, Aminollah Ani²</td>
<td>Iran University of Science and Technology</td>
</tr>
</tbody>
</table>
**WEDNESDAY**

**EuRAD01**
**EuRAD Opening Session**
Chairs: Philippe Eudeline¹, EuRAD 2019 Chair and Jean-Yves Dauvignac², EuRAD 2019 TPC Chair  
Co-chairs: Claire Migliaccio², EuRAD 2019 Co-Chair and Stéphane Méric³, EuRAD 2019 TPC Co-Chair.  
¹Thales Air Systems, ²University Cote d’Azur CNRS LEAT, ³INSA Rennes IETR

---

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Chair (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 – 08:40</td>
<td>Welcome Addresses</td>
<td>Opening of the European Radar Conference 2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Philippe Eudeline¹, EuRAD 2019 Chair and Jean-Yves Dauvignac², EuRAD 2019 TPC Chair</td>
</tr>
<tr>
<td>09:20 – 10:00</td>
<td>Naval and Land-based Multi-Function Radar</td>
<td>Thomas Carpentier, Ground MFR Product Manager</td>
</tr>
<tr>
<td>10:10</td>
<td>End of Session</td>
<td></td>
</tr>
</tbody>
</table>

---

**EuMC10**
**Biomedical Applications**
Chair: Jan Vrba¹  
Co-Chair: Christian Schulz²  
¹Czech Technical University in Prague, ²Ruhr-Universität Bochum

**EuMC11**
**Special Session AMPC**
Chair: Maurizio Bozzi²  
Co-Chair: Arokiaswami Alphones¹  
¹Nanyang Technological University, ²University of Pavia

---

**EuMC10-1**
**High Efficiency 5.8 GHz Class F and Class J Amplifiers with Portable Haemostatic Applications**
Abdul Moiz Ahmed Pirkani¹, Shaun C. Preston², Christopher Hancock²
¹The University of Manchester, ²Bangor University

**EuMC10-2**
**Microwave-Induced Thermoacoustic Tomography through an Adult Human Skull**
An Yan¹, Xiaojie Chen¹, Jinfeng Li¹, Changjun Liu¹
¹Sichuan University

**EuMC10-3**
**Combining 70MHz and 434MHz or wIRA Hyperthermia Applicators for Optimal Coverage of Semi-Deep Tumour Sites**
Hans Crezee¹, Remko Zweije¹, Akke Bakker¹, Geertjan van Tienhoven¹, Petra Kok¹
¹Academic Medical Center

**EuMC10-4**
**Design and Implementation of Injection Locked Oscillator Biosensors**
Meesa Babay¹, Claire Dalrey², Bruno Barelaud³, Arnaud Pihlott³, David Cordieu³, Mehmet Kaynak³, Emre Can Durmaz³, Canan Baristiran Kaynak³
¹XLIM Research Institute, University of Limoges, Limoges, France, ²HP, 10236, Frankfurt (Oder), Germany

---

**Introduction**
Roberto Sorrentino¹  
¹RF Microtech Srl

**Silicon mm-wave ICs and Communication Systems**
Kaluse Ma¹  
¹Tianjin University

**Wireless Power Transfer in Japan and in Asia**
Nadis Shirohara¹  
¹Kyoto University

**Self-Injection-Locked Radar for Biomedical Applications**
Jason Ham Tzy-Sheng¹  
¹National Sun Yat-Sen University
EuMC12
MEMS, Phase-Change and Oxide Material Devices
Chair: Andrea Muller¹
Co-Chair: Rolf Jakoby²
¹TU Darmstadt, IMP, ²TU Darmstadt, ATFT

EuMC13
Planar Filters I
Chair: Cristiano Tomassoni¹
Co-Chair: Jerzy Michalski²
¹University of Perugia, ²SpaceForest Ltd.

EuMC14
Focused Session
Electromagnetic Methods for Monitoring and Manipulating Cells and Tissues
Chair: Francesco Apollonio¹
Co-Chair: Maxim Zhadobov²
¹ICEmB at DIET University of Rome Sapienza, ²CNRS, Institut d’Électronique et de Télécommunications de Rennes, UMR-6164

EuMC15
Antennas for Communication
Chair: Ioan Lager¹
Co-Chair: Tobias Chaloun²
¹Technicolor Research and Innovation, ²University Ulm

E04
Tu Darmstadt, IMP, ²TU Darmstadt, ATFT
Maune¹
Dominik Walk¹, Daniel Kienemund¹, Patrick
Component Structure to SMD Varactor: From Test All-Oxide Thin Film
Tejinder Singh¹, Raafat Mansour¹
Unit-Cell Four-Port RF Switch
PCM Based Scalable
A Miniaturized Monolithic EuMC12-4
EuMC13-1
MEMS Switches for mm-Wave Applications
Romain Stefanini¹
*Alkeme
EuMC13-2
Back-to-Back Connected Multiplexers for a Broadband Channel Splitter and Channel Combiner
Sanghoon Shin¹, Eric J. Naglich², Luciano Boglione¹
¹U.S. Naval Research Laboratory, ²Lehigh University
EuMC13-3
Ultra-Wideband Bandpass Filter Using Solder-Mask Based Multilayer Technology
Hasan Bouazzaz¹, Alexandre Manchete², Rozan
Alani³, Cédric Quendo², Benjamin Potelot¹
¹Ecole polytechnique fédérale de Lausanne (EPFL), ²ITT Rennes, UMR–6164, ³imec / Ghent University
EuMC13-4
Direct Synthesis of Quad-Band Pass Filter by Frequency Transformation Methods
Yi Wu¹, Eric Fourn¹, Philippe Besnier¹
¹Institut d’électronique et de Télécommunications de Rennes, IETR, ²Lab-STICC, Université de Rennes, IRISA, ³Protos (ITD)
EuMC13-5
All-Oxide Thin Film Varactor: From Test Structure to SMD Component
Dorina Chiah¹, Daniel Kienemund², Patrick Sal¹, Luke Zeiner¹, Alain Roebéka, Philip Kowalski¹, Lambert A², Rolf Jakoby³, Holger Mauritz¹
¹TU Darmstadt, IMP, ²TU Darmstadt, ATFT
EuMC14-1
MilliFluidic Sensor Dedicated to the Microwave Dielectric Spectroscopy of Liquids
Patricia Felipe Jacque González¹, Khaled Douari², David Dubuc³, Thierry Veronneau²
¹LAAS-CNRS, ²Ovale-Innovation
EuMC14-2
Ultra-wideband Electrical Sensing of Nucleus Size in a Live Cell
Xiaotian Du¹
¹Lehigh University
EuMC14-3
Radiation Performance of Highly Miniaturized Implantable Devices
Denny Nicolás², Maxim Zhadobov², Wout Joseph³, Ruan Souless¹
¹École polytechnique fédérale de Lausanne (EPFL), ²ITT Rennes, UMR–6164, ³Institut d’Électronique et de Télécommunications de Rennes, UMR-6164, ⁴Université Paris-Sud, Université Paris-Saclay, Gustave Roussy, Villejuif, France
EuMC14-4
Numerical Investigations of CW Electric Fields on Lipid Vesicles for Controlled Drug Delivery
Laura Caramazza¹, Annalisa De Angelis¹, Elena Della
Limoges, France
EuMC12-2
A Compact Radial Divider Combiner for High power MEMS Switches
Rami Daher¹, Pierre Bundo²
¹XLIM Research Institute - UMR CNRS 7252, ²AirMems
EuMC13-1
Microwave Filter Manufactured on Conventional or Innovative Technologies
Alexandre Manchete²
*Elipika
EuMC13-2
Back-to-Back Connected Multiplexers for a Broadband Channel Splitter and Channel Combiner
Sanghoon Shin¹, Eric J. Naglitch², Luciano Boglione¹
¹U.S. Naval Research Laboratory, ²Lehigh University
EuMC14-1
MilliFluidic Sensor Dedicated to the Microwave Dielectric Spectroscopy of Liquids
Patricia Felipe Jacque González¹, Khaled Douari², David Dubuc³, Thierry Veronneau²
¹LAAS-CNRS, ²Ovale-Innovation
EuMC14-2
Ultra-wideband Electrical Sensing of Nucleus Size in a Live Cell
Xiaotian Du¹
¹Lehigh University
EuMC14-3
A Microfluidic Realistic Model to Study Frequency-Dependent Electroporation in a Cell with Endoplasmic Reticulum
Maria De Angelis¹, Agnese Denza¹, Caterina Merli², Tomas Garcia-Sanchez¹, Franck Andre¹, Luis Mr³
¹ICEmB at DIET University of Rome Sapienza, ²ENEA, SSPT – Division of Health Protection Technologies, Rome, Italy, ³CNRS, Univ. Paris-Sud, Université Paris-Saclay, Gustave Roussy, Villejuif, France
EuMC14-4
Radiation Performance of Highly Miniaturized Implantable Devices
Denny Nicolás², Maxim Zhadobov², Wout Joseph³, Ruan Souless¹
¹École polytechnique fédérale de Lausanne (EPFL), ²ITT Rennes, UMR–6164, ³Institut d’Électronique et de Télécommunications de Rennes, UMR-6164, ⁴Université Paris-Sud, Université Paris-Saclay, Gustave Roussy, Villejuif, France
EuMC15-1
Compact, Two-Port, Slot, Antenna for Dual-Band WiFi 2x2 MIMO Applications
Abdullah Haslo³, Anthony Pesina¹, Jean-Yves Le Naour¹, Ali Louzir¹
¹Technicolor Research and Innovation, ²University Sapienza, ³CNRS, Univ. Paris-Sud, Université Paris-Saclay, Gustave Roussy, Villejuif, France
EuMC15-2
Compact, Integrated, Four-Sector, Antenna for Sub-6GHz 5G Indoor Access and Content Distribution over WiFi
Abdullah Haslo³, Anthony Pesina¹, Jean-Yves Le Naour¹, Ali Louzir¹
¹Technicolor Research and Innovation, ²University Sapienza, ³CNRS, Univ. Paris-Sud, Université Paris-Saclay, Gustave Roussy, Villejuif, France
EuMC15-3
Characterization of a Low-Profile Quad-Feed Based Transmitarray Antenna at V-Band
Antonio Clerente¹, Maciej Smierzchalski¹, Mathieu Huchard², Cyril Bamber², Thierry Le Nataf²
¹ICEmB@DIIET, University of Rome Sapienza, ²ENEA, UMR–6164, ³imec / Ghent University
EuMC15-4
High Self-Interference Cancellation Antenna for In-Band Full Duplex Communication System
Ghislain Chauveau¹, Jun Hyung Jeong¹, Chunam Park¹, Phirun Kim¹, Yongchae Jeong¹, Girdhari Chaudhary¹, Junhyung Jeong¹, Phanam Pech¹, Phichet Kam¹, Yongchae Jeong¹
¹Chonbuk National University, ²University Ulm, ³Department of Drug Chemistry and Technology, "Sapienza" University of Rome, Italy, ⁴CNRS, Univ. Paris-Sud, Université Paris-Saclay, Gustave Roussy, Villejuif, France
EuMC15-5
Compact Wideband CPW-fed Tri-Band Antenna With Multi-shaped Strips for WLAN/ WiMAX Applications
Bryan Yan¹, Weling Sheng¹, Jie Gu¹, Jie Lu¹
¹Nanjing University of Science and Technology, ²University of Perugia, ³SpaceForest Ltd.
EuMC/EuRAD 2019

**E01**

**EuMC/EuRAD01**

Diverse Radar Applications
Chair: Mehmet Karaaslan¹
Co-Chair: Korkut Yegin²
¹Teledyne e2v, ²Yeditepe University

**EuMC/EuRAD02**

Antennas for Radar Application
Chair: Matthias Geissler¹
Co-Chair: Józef Modelski²
¹IMST GmbH, ²Warsaw University of Technology

**EuMC16**

Transmitter/Receiver Circuits
Chair: E. van Vliet¹
Co-Chair: A. van Dijk²
¹TNO, ²Universidad de Cantabria

**Wednesday**

10:50 - 11:10

**EuMC/EuRAD01-1**

Transient Waveforms Shaping for Frequency Diversity Radar Applications
Gwenael Reineix¹, Jérémy Hyvernaud¹, Romain Négrier¹, Joël Andrieu¹, Michèle Lalande¹
¹Xlim, University of Limoges

**EuMC/EuRAD02-1**

Investigation of Bent PCB Laminates for Conformal Antennas at 80 GHz
Jonathan Mayer¹, Manuel Naided¹, Jézy Kosilewski³, Thomas Zwick³
³Karlsruhe Institute of Technology (KIT), ³Swizerland Electronit AG

**EuMC16-1**

Analysis of High-Order Sub-Harmonically Injection-Locked Oscillators
Sabya Hernandez¹, Mubie Pohoon², Sergio Sando³, Almudena Sulayet³
²University of Cantabria

11:10 - 11:30

**EuMC/EuRAD01-2**

An Original UWB Radar Platform Based on Coherent Interleaving Sampling Technique
Oussama Hamdi¹, Maxime Schutz¹, Said Farih³, Sebastian Reinaud³, Arnaud Dellar¹, Bertrand Lenor⁴, Guillaume Neuvaz⁴, Cyril Decret⁴, Denis Barataud⁴
¹XLIM Research Institute, University of Limoges, France, ²CISTEME, ³AMCAD Engineering, ⁴Nuxeo SARL

**EuMC/EuRAD02-2**

Evaluation of Antenna Calibration and DOA Estimation Algorithms for FMCW Radars
Michael Stephan¹, Kuan-yia Wang², Torsten Reissland¹, Robert Weigel¹, Fabian Luz²
¹Friedrich-Alexander University Erlangen-Nürnberg (FAU), ²Ecole Polytechnique de Montreal

**EuMC16-2**

HTS Quad-band High-Sensitivity Receiver for 4.5m Radio Telescope
Tarno Kawaguchi¹, Hiroaki Kiyama¹, Kazuhiro Tsubosaki², Hidaka Kanada¹, Taro Asakura²
¹Toshiba Corporation, ²Toshiba Hokuto Electronics Corporation

11:30 - 11:50

**EuMC/EuRAD01-3**

Clutter-Resistant Vital Sign Detection Using Amplitude-Based Demodulation by EEMD-PCA-Correlation Algorithm for FMCW Radar Systems
Ching-Yi Huang¹, Guan-Wei Fang¹, Hsu-Ru Chuang¹, Chiu-Kuang Yang¹
¹Department of Electrical Engineering, National Cheng Kung University ¹, University Road Tainan City Taiwan, National Cheng-Kung University

**EuMC/EuRAD02-3**

A 3D-Printed Coaxial-fed Waveguide 2-Element Array for an AESA Radar Application in the Ku-band
Sama Ahrabi¹, Rizwan Alianic¹, Norbert Quintero¹, Julian Huntam², Cedro Guendi³, Thomas Merlet³
³LABSTICC-UBO, ³Thales LAS, ³Elliptika

**EuMC16-3**

5G RF Front End Module Architectures for Mobile Applications
Florent Baillitsu¹, Hardik Modi², Yunyoung Choi², Junhyung Lee², Sabe Khesba²
²Skyworks Solutions Inc.

11:50 - 12:10

**EuMC/EuRAD01-4**

Time Domain Analysis of Microwave Signal Propagating along FRPM Pipe Walls and Application to Non-destructive Inspection
Sayaka Matsukawa¹, Kosuke Yoshida¹, Yoshihiro Nishimura¹, Tadashi Okuda¹, Masaya Hazama², Satoshi Kusaka², Hidemitsu Morita²
²NIIKUST, ³Me University, ³Kyotoshi Ltd.

**EuMC/EuRAD02-4**

Design of a Horizontally Polarized Slotted Waveguide Antenna Element for Airborne Ka-PolInSAR System
Aliza Kesar¹
¹German Aerospace Center (DLR)

**EuMC16-4**

Reconfigurable Series Feed Network for Squint-free Antenna Beamforming Using Distributed Amplifier-Based Negative Group Delay Circuit
Minho Zhu, Chung-Tse Michael Wu¹
¹Rutgers University

12:10 - 12:30

**EuMC/EuRAD01-5**

Guided Wave Tank Level Sensor
Alexander Kaineder¹, Christoph Michaleitner¹, Dirk Hammershmidt¹, Andreas Stelzer¹
³KLU University Linz, ³Infinon Technologies Austria AG

**EuMC/EuRAD02-5**

Millimeter-wave Stepped Series Array with LTCC
Sabir Karki¹, Juhu Ali-Laurinaho¹, Jantang Zheng¹, Markku Laihri, Yilei Yuan²
²Aalto University, ³VTT Technical Research Centre of Finland

**EuMC16-5**

A Wideband Beamformer using 3.25 GS/sec Discrete-time Analog FIR Filter ICs
Shinwoo Park¹
¹Qualtanm
**EuMC17**
**Special Session LAMC**
Chair: Jose E. Rayas-Sánchez¹
Co-Chair: Guillermo Rafael-Valdivia¹, Almudena Suárez²
¹ITESO - The Jesuit University of Guadalajara, ²Universidad Tecnológica de Panamá, “Instituto de Investigaciones Científicas y Servicios de Alta Tecnología

**EuMC18**
**Emerging Components and Integration Techniques**
Chair: Ke Wu¹
Co-Chair: Kamlal Samanta²
¹Ecole Polytechnique de Montreal, ²Sony Europe

**EuMC19**
**Non-Planar Filters II**
Chair: Vicente E. Boria¹
Co-Chair: Stéphane Bila²
¹Universitat Politècnica de València, ²Université de Limoges, CNRS, XLIM UMR 7252

**EuMC18-1**
Towards More Effective Electrical Thermal Co-design with Carbon Aluminum Composite EMI Shield
Baratunde Cola¹
¹CARBICE

**EuMC19-1**
Widely-Reconfigurable 2.5:1 Coaxial-Cavity Resonators Using Actuated Liquid-Metal Posts
Kshitij Sadasivan¹, Dimitra Psychogiou¹
¹University of Colorado Boulder

**EuMC18-2**
Concurrent Dual-Mode Circulator
Amir Afshani¹, Ke Wu¹
¹Ecole Polytechnique de Montreal

**EuMC19-2**
3D Compact High-Q Filter Made of High-Permittivity Ceramic
Yaakoub Dia¹⋅², Laure Hulot¹, Stéphane Bila¹, Marc Thévenoud, Christophe Deleuze²
¹Université de Limoges, CNRS, XLIM UMR 7252, ²CEA LETI

**EuMC18-3**
WR12 to Planar Transmission Line Transition on Organic Substrate
Johannes Jakob¹, Roman Sammer¹, Franz Xaver Röhrl¹, Stefan Zorn¹, Werner Bugner¹
¹Oberpfaffenhofen Institute of Technology, ²Rohde & Schwarz GmbH & Co. KG

**EuMC19-3**
Synthesis Method for Manifold-Coupled Multiplexers
David Martinez¹⋅²
¹XLIM Research Institute - UMR CNRS 7252, ²INRIA

**EuMC18-4**
Hermetically Sealed Glass Package for Highly Integrated MMICs
Thomas Saleh¹, Tobishe Chakwira¹, Malte Schulz-Rüdiger¹, Kevin Kühn², Christian Walschmidt²
¹University Ulm, ²IKNF, ³IDM-Fraunhofer

**EuMC19-4**
A Novel De-embedding Technique for Frequency Identification of Manifold Coupled Multiplexers
Sayyed Reza Mirnaziry¹, Maysam Haghparast¹, Ali Akbar Ahmadi²
¹Iran Telecommunication Research Center (ITRC), ²Kharazmi University

**EuMC18-5**
90 GHz Micro Laser Sintered Filter: Reproducibility and Quality Assessment
Mian Saleh¹, Xiaobang Shang², Michael Lancaster¹, Robert Roberti¹, Thomas Starke¹, Falko Boeinhauser¹, Daniel Weber⁴
¹The University of Birmingham, ²National Physical Laboratory, ³University of Hong Kong, ⁴3D Micro Print, ⁵Freeman Technology

**EuMC19-5**
Low-Cost Hybrid Manufactured Waveguide Bandpass Filters with 3D Printed Insert Dielectric
Urok Jankovic¹, Nandun Mohottige², Ananjan Basu³, Djuradj Budimir¹
¹University of Westminster, ²Global Invacom Ltd, ³Indian Institute of Technology, Delhi

---

**WEDNESDAY**

| 10:50 - 11:10 | EuMC17-1 RF Exposure due to Mobile Devices Operated Close to the Human Body
Claude Ernesto Hernández-Rodríguez¹, Géovan Bulat¹, A.A. de Salles²
¹IFRS, Federal Institute for Education, ²UFRRGS-Federal University of Rio Grande do Sul |
| EuMC18-1 WR12 to Planar Transmission Line Transition on Organic Substrate
Johannes Jakob¹, Roman Sammer¹, Franz Xaver Röhrl¹, Stefan Zorn¹, Werner Bugner¹ |
| EuMC19-1 Widely-Reconfigurable 2.5:1 Coaxial-Cavity Resonators Using Actuated Liquid-Metal Posts
Kshitij Sadasivan¹, Dimitra Psychogiou¹ |
| EuMC17-2 Microwave-Photonics and WDM-PON Fronthaul for 5G Mobile Systems: Research Activities in Brazil
Romero Murilo A¹, Sedji Jr Amaner Cerequial²
¹Universidade de São Paulo, EESC-USP, ²VNOCA Lab, National Institute of Telecommunications |
| EuMC18-2 Concurrent Dual-Mode Circulator
Amir Afshani¹, Ke Wu¹ |
| EuMC19-2 3D Compact High-Q Filter Made of High-Permittivity Ceramic
Yaakoub Dia¹⋅², Laure Hulot¹, Stéphane Bila¹, Marc Thévenoud, Christophe Deleuze² |
| EuMC17-3 Applications of Broyden-based Input Space Mapping to Modeling and Design Optimization in High-Tech Companies in Mexico
Jose E. Rayas-Sánchez¹, Zabdiel Brita-Brito¹
¹ITESO - The Jesuit University of Guadalajara |
| EuMC18-3 Hermetically Sealed Glass Package for Highly Integrated MMICs
Thomas Saleh¹, Tobishe Chakwira¹, Malte Schulz-Rüdiger¹, Kevin Kühn², Christian Walschmidt² |
| EuMC19-3 Synthesis Method for Manifold-Coupled Multiplexers
David Martinez¹⋅² |
| EuMC18-4 Thermo-Energetic Study in Blood Infected with Plasmodium falciparum Radiated at 2.45GHz
Kurt D. Ng¹, Carlos Picaso², Guadalupe Gonzalez², Carmen Espinosa³, Mayel Zambrano³
¹Facultad de Biología, Universidad de Panamá, ²Facultad de Ing. Eléctrica, Universidad Tecnológica de Panamá, “Instituto de Investigaciones Científicas y Servicios de Alta Tecnología |
| EuMC19-4 A Novel De-embedding Technique for Frequency Identification of Manifold Coupled Multiplexers
Sayyed Reza Mirnaziry¹, Maysam Haghparast¹, Ali Akbar Ahmadi² |
| EuMC17-4 Methodology for Modelling, Design and Implementation of RF Power Amplifiers Based on Pulsed Measurements
Guillermo Rafael-Valdivia¹, Omar Castillo²
¹Ecole Polytechnique de Montreal, ²Balestonar² |
| EuMC18-5 Low-Cost Hybrid Manufactured Waveguide Bandpass Filters with 3D Printed Insert Dielectric
Urok Jankovic¹, Nandun Mohottige², Ananjan Basu³, Djuradj Budimir¹ |

---

**11:10 - 11:30**

**EuMC17-5**
**Methodology for Modelling, Design and Implementation of RF Power Amplifiers Based on Pulsed Measurements**
Guillermo Rafael-Valdivia¹, Omar Castillo²
¹Ecole Polytechnique de Montreal, ²Balestonar²

---

**11:30 - 11:50**

**EuMC17-6**
**RF Exposure due to Mobile Devices Operated Close to the Human Body**
Claude Ernesto Hernández-Rodríguez¹, Géovan Bulat¹, A.A. de Salles²
¹IFRS, Federal Institute for Education, ²UFRRGS-Federal University of Rio Grande do Sul

**EuMC18-6**
**Microwave-Photonics and WDM-PON Fronthaul for 5G Mobile Systems: Research Activities in Brazil**
Romero Murilo A¹, Sedji Jr Amaner Cerequial²
¹Universidade de São Paulo, EESC-USP, ²VNOCA Lab, National Institute of Telecommunications

**EuMC19-6**
**Widely-Reconfigurable 2.5:1 Coaxial-Cavity Resonators Using Actuated Liquid-Metal Posts**
Kshitij Sadasivan¹, Dimitra Psychogiou¹
¹University of Colorado Boulder

**EuMC17-7**
**Applications of Broyden-based Input Space Mapping to Modeling and Design Optimization in High-Tech Companies in Mexico**
Jose E. Rayas-Sánchez¹, Zabdiel Brita-Brito¹
¹ITESO - The Jesuit University of Guadalajara

**EuMC18-7**
**Concurrent Dual-Mode Circulator**
Amir Afshani¹, Ke Wu¹
¹Ecole Polytechnique de Montreal

**EuMC19-7**
**3D Compact High-Q Filter Made of High-Permittivity Ceramic**
Yaakoub Dia¹⋅², Laure Hulot¹, Stéphane Bila¹, Marc Thévenoud, Christophe Deleuze²
¹Université de Limoges, CNRS, XLIM UMR 7252, ²CEA LETI

**EuMC17-8**
**Thermo-Energetic Study in Blood Infected with Plasmodium falciparum Radiated at 2.45GHz**
Kurt D. Ng¹, Carlos Picaso², Guadalupe Gonzalez², Carmen Espinosa³, Mayel Zambrano³
¹Facultad de Biología, Universidad de Panamá, ²Facultad de Ing. Eléctrica, Universidad Tecnológica de Panamá, “Instituto de Investigaciones Científicas y Servicios de Alta Tecnología

**EuMC18-8**
**Hermetically Sealed Glass Package for Highly Integrated MMICs**
Thomas Saleh¹, Tobishe Chakwira¹, Malte Schulz-Rüdiger¹, Kevin Kühn², Christian Walschmidt²
¹University Ulm, ²IKNF, ³IDM-Fraunhofer

**EuMC19-8**
**A Novel De-embedding Technique for Frequency Identification of Manifold Coupled Multiplexers**
Sayyed Reza Mirnaziry¹, Maysam Haghparast¹, Ali Akbar Ahmadi²
¹Iran Telecommunication Research Center (ITRC), ²Kharazmi University

---

**11:50 - 12:10**

**EuMC17-9**
**Methodology for Modelling, Design and Implementation of RF Power Amplifiers Based on Pulsed Measurements**
Guillermo Rafael-Valdivia¹, Omar Castillo²
¹Ecole Polytechnique de Montreal, ²Balestonar²

**EuMC18-9**
**90 GHz Micro Laser Sintered Filter: Reproducibility and Quality Assessment**
Mian Saleh¹, Xiaobang Shang², Michael Lancaster¹, Robert Roberti¹, Thomas Starke¹, Falko Boeinhauser¹, Daniel Weber⁴
¹The University of Birmingham, ²National Physical Laboratory, ³University of Hong Kong, ⁴3D Micro Print, ⁵Freeman Technology

**EuMC19-9**
**Low-Cost Hybrid Manufactured Waveguide Bandpass Filters with 3D Printed Insert Dielectric**
Urok Jankovic¹, Nandun Mohottige², Ananjan Basu³, Djuradj Budimir¹
¹University of Westminster, ²Global Invacom Ltd, ³Indian Institute of Technology, Delhi
<table>
<thead>
<tr>
<th>Presentation ID</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>EuMC20-1</td>
<td>Waveguide Coupler Design Method for Permittivity Measurement at millimeter-wave applications</td>
<td>Karrar Al Khanjar¹, Tarek Djerafi¹ ¹Institut National de la Recherche Scientifique (INRS)</td>
</tr>
<tr>
<td>EuMC20-2</td>
<td>A 2X3 Hybrid Substrate Integrated Waveguide Coupler Applied to Beamforming Network</td>
<td>Tongfeng Guo¹, Ben You¹, Ke Wu¹ ¹ École Polytechnique de Montréal</td>
</tr>
<tr>
<td>EuMC20-3</td>
<td>Design of an X-Band Suspended Stripline Unequal Split Power Distribution Network</td>
<td>Guillermo Posada Julquina¹, Juan Carlos Lepuente Vera¹, Carlos Zarzuelo Torres¹ ¹INDRA Sistemas</td>
</tr>
<tr>
<td>EuMC20-4</td>
<td>60 GHz Double Edge Coupled Marchand Balun for PCB Implementation</td>
<td>Muhammad Omar¹, Martin Laabs¹, Niels Neumann¹, Dirk Plettemeier¹ ¹Technische Universität Dresden</td>
</tr>
<tr>
<td>EuMC20-5</td>
<td>Power Summation in Ultra-Thin Planar Dielectric Resonator with Gunn-Diodes</td>
<td>Roman Ciupa¹, Alexander Kogut¹, Zoya Erenenko¹, Igor Kuzmich², Mohammad Islam¹ ¹ Ç. Ya. Ulyanov Institute for Radiophysics and Electronics National Academy of Sciences of Ukraine, ²Univ. Kebangsaan Utara</td>
</tr>
<tr>
<td>EuMC20-6</td>
<td>Electrolyte Concentration Measurements in DI Water with 0.125 g/L Resolution by means of CSRR-Based Structures</td>
<td>Paris Vélez¹, Jonathan Muñoz-Ereano¹, Ferran Martin¹ ¹Universitat Autònoma de Barcelona</td>
</tr>
<tr>
<td>EuMC20-7</td>
<td>Conductor-Backed Coplanar Waveguide on BCB with Thin Metal Layers and Via Holes</td>
<td>Anne-Sophie Grua-Massot¹, Imene Kaddour¹, Paul Cruzd¹, Farah Amor¹, Cedric Villebasse¹, David Bouville¹, Frédéric Hamouda¹, Frédéric Arel¹ ¹CN, Univ Paris-Sud-Paris-Saclay, CNRS UMR9001</td>
</tr>
<tr>
<td>EuMC20-8</td>
<td>Design and Validation of V-Band Microwave Coaxial Switch</td>
<td>Qunfeng Chang¹ ¹Beijing Institute of Aerospace Micro-Electromechanical Technology</td>
</tr>
<tr>
<td>EuMC20-9</td>
<td>A W-Band Stepped Impedance Transformer Transition from SIW to RWG for Thin Single Layer Substrates with Thick Metal Cladding</td>
<td>Steffen Hansen¹, Nils Pohl² ¹Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, ²Ruhr-University Bochum</td>
</tr>
<tr>
<td>EuMC20-10</td>
<td>Planar Millimetre-Wave Waveguide Transition for Material Characterization at 79 GHz</td>
<td>Wael A. Ahmed¹, Tomohiko Inoue¹, Delmar Klasinger¹, Herman J. Ng¹ ¹HP - Leibniz-Institut für innovative Mikroelektronik, ²Nippon Pilar, ³Um University</td>
</tr>
<tr>
<td>EuMC20-11</td>
<td>C-Band Microstrip Lossy Filter using Resistive-loaded Closed-Loop Resonators</td>
<td>Jiaoyan Guo¹, Hongliang Guo¹, Ya N¹, Jieheng Hong¹, Petronilo Martin Igeleza¹ ¹Hong Kong University of Science and Technology, ²ESATEC</td>
</tr>
<tr>
<td>EuMC20-12</td>
<td>Dual-Band Bandpass SIW Resonator Filter with Flexible Frequency Ratio</td>
<td>Wenkai Li¹, Tae-Hak Lee¹, Ke Wu¹ ¹École Polytechnique de Montréal</td>
</tr>
<tr>
<td>EuMC20-13</td>
<td>Planar Diplexer Design Using Hairpin Resonators Loaded with External Capacitors for Improvement of Isolation and Stopband Rejection Levels</td>
<td>Yi-Fan Tsao¹, Ting-Jui Huang¹, Heng-Tung Hsu¹, Chia-Wei Wu² ¹National Chiao Tung University, ²Yuan Ze University</td>
</tr>
<tr>
<td>EuMC20-14</td>
<td>Strip-Loaded Coplanar Waveguide Bandpass Filter with Wideband Spur-Free Response</td>
<td>Mohamed Elshafei¹, Amir Ebrahimi¹ ¹RMIT University</td>
</tr>
<tr>
<td>EuMC20-15</td>
<td>Design and Implementation of High Frequency and Large Group Delay Bridged-T All Pass Network</td>
<td>Ritesh Kumar¹, Vinoy K J¹ ¹Indian Institute of Science, Bangalore</td>
</tr>
<tr>
<td>EuMC20-16</td>
<td>Narrow Bandpass Filters Using Microstrip Lines Loaded with Asymmetric Bandstop Resonator Pairs</td>
<td>Aida Ebrahimi¹, James Scott¹, Kamaran Ghorban¹ ¹RMIT University</td>
</tr>
<tr>
<td>EuMC20-17</td>
<td>Design and Manufacturing of a Compact Stripline Lowpass Filter to be Integrated into Panel Antennas</td>
<td>Ana Álvarez Mellado¹, Carlos Zarzuelo Torres¹ ¹INDRA Sistemas</td>
</tr>
<tr>
<td>EuMC20-18</td>
<td>Equivalent Calculation Method for Low-Pressure Discharge Threshold of Ridge Waveguide Filter</td>
<td>Rui Wang¹ ¹National Key Laboratory of Science and Technology on Space Microwave, CAST, Xi’an, China</td>
</tr>
<tr>
<td>EuMC20-19</td>
<td>A Post-fabrication Tuning Method using Space Mapping and Surrogate Modeling Techniques</td>
<td>Xiaolin Fan¹, Song Li¹ ¹University of Regina</td>
</tr>
<tr>
<td>EuMC20-20</td>
<td>Investigation of Stored Energy Distribution in Filters Using K-Means Clustering Algorithm</td>
<td>Ruha Parandkesh-Valizadeh¹, Ian Hunter¹, Natsong Sonjir¹, Evandro Muxoud¹, Mustafa S. Bakr¹, Richard Parry¹ ¹University of Leeds, Leeds, United Kingdom, ²University of Zambia, ³Radio Design Ltd</td>
</tr>
</tbody>
</table>
EuMC/EuRAD03
Space and UAV applications
Chair: César Barquinero¹
Co-Chair: Angel Medavilla²
¹INDRA Sistemas, ²Universidad de Cantabria

EuMC21
GaN HEMT Based Power Amplifiers
Chair: Almudena Suarez¹
Co-Chair: Vittorio Camarchia²
¹University of Cantabria, ²Politecnico di Torino

EuMC22
Near-Field and Far-Field Millimeter-Wave Measurements
Chair: Juan-Mani Coñantes¹
Co-Chair: Eric Bergeault
¹UP/IEHU

EuMC/EuRAD03-1
New Trends on Telecom Satellites and their Consequences on Microwave Units
Jean-François Villemazet¹
¹Thales Alenia Space en France

EuMC21-1
Broadband GaN Power Amplifier Design and Integration: Industrial Challenges and Advanced Techniques
Kamil K. Semanta¹
¹University of Colorado at Boulder, ²Chalmers University of Technology

EuMC22-1
Radio Frequency Weapons: Sources, Effects, Test and Protection
Jean-Christophe Joly¹
¹CEA Gramat - CEA DAM

EuMC/EuRAD03-2
Science Instruments for CubeSats and SmallSats
Gourdon Chattend¹
NASAJPL/Caltech

EuMC21-2
Over 20 W 2.5 to 10.5 GHz Wideband Two-Stage GaN MMIC Power Amplifier with Distributed and Reactively-Matched Amplifier Stages
Jun Kamikos¹, Masatane Hangai¹, Ryota Komaru¹, Takuo Monto³, Yoshitsuka Kamo¹, Shinzou Shinga¹
¹Mitsubishi Electric Corporation

EuMC22-2
Probing Millimeter-Wave Antennas and Arrays in their Reactive Near-Field
Jan Hesselbarth¹, Georg Stedl¹, Jose Moreira²
¹University of Stuttgart, ²Advantest Europe GmbH

EuMC/EuRAD03-3
A New Radiospectrometer to Study the CMB Deviations at 10-20 GHz
Paz Alonso-Arias¹, Roger Hooydon², Javier De Miguel-Hernandez³, José Alberto Rubio-Martín³,4
³Instituto de Astrofísica de Canarias (IAC), 4Universidad de La Laguna

EuMC21-3
A 40 W Ka-Band RF Amplification Chain for Space Telecommunication SSPA Applications
Allison Duh¹, Maxwell Duffy¹, William Hallberg², Mauricio Pinto¹, Taylor Barton¹, Zoya Popovic¹
¹University of Colorado at Boulder, ²Chalmers University of Technology

EuMC22-3
Characterization of 5G Phased Arrays at 28 GHz by Time-Domain Near-Field Scanning
Michael Haidar¹, Pablo Corrales¹, Nicolás Gómez¹, Chue-shen Lin², Wei-Chang³, Wen-Tsai Teuf², Siddha Wane², Damienne Bijou², Johannes Ruiss³,⁴ Technical University of Munich, ⁵AI-Technologies, ⁶AVG, ⁷TIMTEK, ⁸YSAB-SUPAERO, Université de Toulouse

EuMC/EuRAD03-4
Comparison between Mixer and Track and Hold UWB Receivers for SATCOM Applications
Arij Battikh¹,² Abhijeet Dasgupta¹,² Guillaume Neveux¹, Carlos Bautista³, Cádiz Chambon³
¹XLIM Research Institute - UMR CNRS 7252, ²Callisto Space, ³XLIM

EuMC21-4
A 10.8-GHz GaN MMIC Load-Modulated Amplifier
Allison Du¹, Maxwell Duffy¹, William Hallberg², Mauricio Pinto¹, Taylor Barton¹, Zoya Popovic¹
¹University of Colorado at Boulder, ²Chalmers University of Technology

EuMC22-4
Measurement Method for Characterizing Nonlinearity Under Near-Field and Far-Field Interferers in 5G mmWave Phased Arrays
Nuobi Tien³, Marco E. Leitner¹, Markku Jokinen¹, James P. Akio³, Ob Kuns¹, Markku Sonkki¹, Timo Rahkonen¹, Aarno Pärsänen¹
¹University of Oulu

EuMC/EuRAD03-5
Design Study for UAV-Mounted GPR
Maxime Schütz¹,² Cyril Derenço³, Michèle Lalander¹, Bertrand Lessard²
¹Univ. Limoges, CNRS, XLIM, UMR 7252, ²NOVOS SAS

EuMC22-5
5G Millimeter-Wave Beam Adaptation for Indoor Moving Users
Robbert Schuppan¹, Bart Smolders¹, Ulf Johannsen¹
¹Eindhoven University of Technology
EuMC24 Planar Filters II
Chair: Roberto Gómez-García¹
Co-Chair: Dimitra Psychogiou²
¹University of Alcala, ²University of Colorado Boulder

EuMC24-1 Compact Square/Triangle Mixed-Shape Quarter-Mode Substrate Integrated Waveguide Bandpass Filter with Wide Stopband
Phirun Kim¹, Wang Qi¹, Phanam Pech¹, Junhyung Jeong¹, Yongchae Jeong¹
¹Chonbuk National University

EuMC24-2 Multilayered Wideband Balun Bandpass Filters Designed with Input Reflectionless Response
Li Yang¹, Roberto Gómez-García¹, José-Maria Muñoz-Ferreras¹, Wenjie Feng²
¹University of Alcala, ²Nanjing University of Science and Technology

EuMC24-3 Topology and Rigorous Design Method for Reflectionless Bandstop Filter
Jongheun Lee¹, Boyoung Lee¹, Seunggoo Nam¹, Juseop Lee¹
¹Korea University

EuMC24-4 Magnet-less Non-Reciprocal Bandpass Filters With Tunable Center Frequency
Dakotah Simpson¹, Dimitra Psychogiou²
¹University of Colorado at Boulder, ²University of Colorado Boulder

EuMC23 Millimeter-wave Transition Structures and Packaging Techniques
Chair: Mehmet Kaynak¹
Co-Chair: Claire Dalmay²
¹IHP, 15236, Frankfurt (Oder), Germany, ²XLIM Research Institute, University of Limoges, Limoges, France

EuMC23-1 D-band Silica-Based Package Substrate with EBG Structure for Flip-Chip Modules
Masaharu Ito¹, Tsunehisa Masumoto¹
¹NEC Corporation

EuMC23-2 F-band Low-loss Tapered Slot Transition for Millimeter-wave System Packaging
Ahmed Hassona¹, Zhongya Simon He¹, Vessen Vasilev¹, Herbert Zirath¹
*Chalmers University of Technology

EuMC23-3 A Compact 28 GHz RF Front-end Module using IPDs and Wafer-level Metal Fan-out Packaging
Jongmin Yook¹
*KETI (Korea Electronics Technology Institute)

EuMC23-4 Broadband Stacked-Patch Transition from Microstrip Line to Circular Dielectric Waveguide for Dual-Polarized Applications at W-Band Frequencies
Andre Meyer¹, Martin Schneider¹, Simon Karau¹
*Universität Bremen

EuMC23-5 A Novel Miniaturized High Performance BGA RF Transition for Ka Band Applications
Fuat Almatas¹
*AseaBbn Inc.

EuMC23-6 Design of Wideband Bandpass Filters Using Parallel-Coupled Asymmetric Three Line Structures with Adjustment Elements
Elif Güntürkün Şahin¹, Ali Kursad Gorur², Ceyhun Karapuz³, Adnan Gorur¹
¹Nigde Omer Halisdemir University, ²Nevsehir Haci Bektas Veli University, ³Pamukkale University
Hotel Booking Form 2019

Rooms are held on a guaranteed basis. For this reason, you are asked to supply a credit card number and full company details. If your travel plans change and you wish to cancel your accommodation, please contact Sally Garland on +44 (0)7775 744193 or email sally@connexhotelsandevents.com to avoid any non-arrival or cancellation charges, as each hotel has a different cancellation policy, full cancellation details will be clearly marked on every booking confirmation. Prepay rates are non-refundable and non-cancelable.

For more Hotel options and to reserve your room online visit

Or complete the booking form below and email to Sally@connexhotelsandevents.com

Contact Name: ________________________________  Company: ________________________________

Address: ____________________________________________________________

City: ___________________________  Post Code: ______________________________

Telephone: ___________________________  Fax: ______________________________

Email: ________________________________

Date of Arrival: ___________________________  Date of Departure: ___________________________

Number of rooms required:   _______ Single Room(s)         _______ Twin Room(s)         _______ Double Room(s)

First choice Hotel: _______________________________________________________

Second choice Hotel: _____________________________________________________

Guest Names: ___________________________________________________________

In order to guarantee the accommodation, please provide us with your credit card details:

Credit Card Number: ______________________________________________________

Name on Card: ___________________________  Expiry Date: ________ / ______

I authorise that any no show or late cancellation charges, as stipulated in the Hotelzon / Connex booking confirmation will be charged to this credit card.

Signed ___________________________________________  Date: ___________________________

Tel: +44 (0)7775 744193, Email: sally@connexhotelsandevents.com
## Headquarters Hotel

<table>
<thead>
<tr>
<th>Hotel Name</th>
<th>Rating</th>
<th>Rooms from</th>
<th>Prepay</th>
<th>Flexible</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marriott Paris Rive Gauche Hotel</td>
<td>★★★★</td>
<td>from 12</td>
<td>€292.00 B&amp;B</td>
<td>€360.00 B&amp;B</td>
<td>Rooms can be cancelled or amended up until a few days before arrival, individual policy will be stated on the booking confirmation. Prepay = Room rate will be charged at the time of booking, to the credit card used to guarantee the reservation, after this the room is non-refundable. Flexible = Room rate includes breakfast; however, breakfast is available at the hotel at an extra cost.</td>
</tr>
<tr>
<td>Mercure Paris Vaugirard Porte de Versailles</td>
<td>★★★★</td>
<td>from 13</td>
<td>€316.00 B&amp;B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oceana Porte de Versailles</td>
<td>★★★★</td>
<td>from 52</td>
<td>€247.00 RO</td>
<td>€274.00 RO</td>
<td></td>
</tr>
<tr>
<td>OKKO Hotels Paris Porte de Versailles</td>
<td>★★★★</td>
<td>Flexible</td>
<td>€219.00 RO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mercure Paris Porte de Versailles Expo</td>
<td>★★★★</td>
<td>Prepay</td>
<td>€222.00 B&amp;B</td>
<td>€299.00 B&amp;B</td>
<td></td>
</tr>
<tr>
<td>Hotel Auriane Porte de Versailles</td>
<td>★★★★</td>
<td>Flexible</td>
<td>€139.00 RO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lutec Hotel</td>
<td>★★</td>
<td>Flexible</td>
<td>€99.00 RO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hôtel Clarisse</td>
<td>★★★</td>
<td>Flexible</td>
<td>€175.00 RO</td>
<td>€195.00 RO</td>
<td></td>
</tr>
<tr>
<td>ibis Paris Vaugirard Porte de Versailles</td>
<td>★★★</td>
<td>Flexible</td>
<td>€200.00 B&amp;B</td>
<td>€237.00 B&amp;B</td>
<td></td>
</tr>
<tr>
<td>Hotel Residence Quintinie Square</td>
<td>★★★</td>
<td>Flexible</td>
<td>€147.00 RO</td>
<td>€165.00 B&amp;B</td>
<td></td>
</tr>
<tr>
<td>Hotel Convention Montparnasse</td>
<td>★★★★</td>
<td>Flexible</td>
<td>€161.00 RO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novotel Suites Paris Expo</td>
<td>★★★★</td>
<td>Flexible</td>
<td>€223.00 RO</td>
<td>€235.00 RO</td>
<td></td>
</tr>
<tr>
<td>Hôtel Gabriel Issy</td>
<td>★★★</td>
<td>Flexible</td>
<td>€121.00 B&amp;B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B&amp;B Hotel PARIS Malakoff Parc des Expositions</td>
<td>★★</td>
<td>Flexible</td>
<td>€130.00 B&amp;B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aparthotel Adagio access Vanves Porte de Versailles</td>
<td>★★★★</td>
<td>Flexible</td>
<td>€139.00 B&amp;B</td>
<td>€150.00 B&amp;B</td>
<td></td>
</tr>
<tr>
<td>ibis Paris Porte de Versailles Mairie d'Issy</td>
<td>★★★</td>
<td>Flexible</td>
<td>€132.00 B&amp;B</td>
<td>€144.00 B&amp;B</td>
<td></td>
</tr>
<tr>
<td>Paris d'Issy - Hôtel Porte de Versailles</td>
<td>★★</td>
<td>Flexible</td>
<td>€134.00 B&amp;B</td>
<td>€146.00 B&amp;B</td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
- Prepay = Room rate will be charged at the time of booking, to the credit card used to guarantee the reservation, after this the room is non-refundable.
- Flexible = Room can be cancelled or amended up until a few days before arrival, individual policy will be stated on the booking confirmation.
- RO = Room rate does not include breakfast; however, breakfast is available at the hotel at an extra cost.
- B&B = Room rate includes breakfast.
- All rates quoted include VAT at the current rate.
<table>
<thead>
<tr>
<th>EuMC26-1</th>
<th>EuMC26-5</th>
<th>EuMC26-9</th>
<th>EuMC26-13</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Additively Manufactured Interdigitated Capacitors Using Barium Titanate Nanocomposite Inks</strong>&lt;br&gt;Michael Crabbe¹, Ying He², Aloisio Roch³, Prenjeet Chahal⁴, John Pappaloyenu⁵&lt;br&gt;¹Michigan State University</td>
<td><strong>Wearable RFID Tag on Denim Substrate for Indoor Localization Applications</strong>&lt;br&gt;Giacomo Paolo⁶&lt;br&gt;University of Bologna</td>
<td><strong>Screen-Printed Flexible 5G Dual Band Flexible Frequency Selective Surface</strong>&lt;br&gt;khetla Heitan⁷&lt;br&gt;Communication Research Center</td>
<td><strong>Time Domain Characterization of Coupled Strip Line Networks without Changing Terminal Setups</strong>&lt;br&gt;Iwata Sakagami⁸, Xiaodong Wang⁹, Takaaki Ohira⁹&lt;br&gt;¹University of Toyoama, ²Ulm University, ³Toyohashi University of Technology</td>
</tr>
<tr>
<td><strong>Passive Intermodulation and Power Handling for High Power RF MEMS Switches</strong>&lt;br&gt;Chris Giovannetti⁴&lt;br&gt;Merlot Microsystems, Inc.</td>
<td><strong>Ultrasensitive Planar Metamaterials for Material Characterization Using Tapered CSRR with Application to NDT of 3D Printed Structures</strong>&lt;br&gt;Salem Atouba⁵, Yuqi Cui⁶, Marios H. Tzortzis⁶&lt;br&gt;Georgia Institute of Technology</td>
<td><strong>An UHF Software Defined Reflectometer using Under-Sampling Down-Conversion in the ADC</strong>&lt;br&gt;Volker Klöß⁶, Rosson Nunes de Lima⁷, Karolíme Brito de Brito⁸, André Bilaz⁷, André Zimmermann⁸&lt;br&gt;²Institut für Schicht- und Grenzschichtforschung, ¹Universidade Federal da Bahia, ³University of Stuttgart</td>
<td></td>
</tr>
<tr>
<td><strong>Wearable 868 MHz LoRa Wireless Sensor Node on a Substrate-Integrated-Waveguide Antenna Platform</strong>&lt;br&gt;Patrick Van Tom⁴&lt;br&gt;University of Salento</td>
<td><strong>Low Cost 3D Printed Fabry-Perot Antenna for Automotive Radar Applications</strong>&lt;br&gt;Umar Naen⁵, Vincent Fusco⁶, Mike Keaveney⁶, Mike O’Shea⁷, James Breslin⁶&lt;br&gt;Queen’s University Belfast, Analog Devices Inc.</td>
<td><strong>Radar Based Material Characterization at 145 GHz Utilizing an Ellipsoidal Reflector</strong>&lt;br&gt;Jochen Jebramcik⁸, Jan Barowski⁸, Jonas Wagner⁸, Irena Rahsf⁸&lt;br&gt;Ruhr-University Bochum</td>
<td></td>
</tr>
<tr>
<td><strong>Textile Chipless Tag based on Frequency Shift Coding Technique</strong>&lt;br&gt;Lucia Cachia⁴&lt;br&gt;University of Salento</td>
<td><strong>High Transmission Efficiency Metasurface-based Spiral Phase Plate for Generating Vortex Waves</strong>&lt;br&gt;Li Yu⁵, Zhang Qi⁶, Hao Zhu⁶, Xuping Li⁷&lt;br&gt;School of Electronic Engineering, Beijing University of Posts and Communications</td>
<td><strong>WGM Resonators for Conductivity Measurements of Graphene Films</strong>&lt;br&gt;Iryna Potereiko⁵, Alexander Barannik⁵, Nikolay Chetp⁴, Ileviub Gubri⁴, Dmitriy Kiveev⁵, Svetlana Vitaliieva⁵&lt;br&gt;²Institute for Radiophysics and Electronics, NAS of Ukraine, ³Bioelectronics (ICS-8), Forschungszentrum Juelich, Juelich, Germany</td>
<td><strong>Reconfigurable Nonlinear Circuit for Wireless Power Harvesting and Backscattering</strong>&lt;br&gt;Xiaoqiang Gu⁹, Simon Hermou¹⁰, Yi Wu¹⁰&lt;br&gt;¹Ecole Polytechnique de Montreal, ²University of Barcelona</td>
</tr>
<tr>
<td><strong>Passive Multiband Antenna for Indoor Localization Applications</strong>&lt;br&gt;Giacomo Paolo⁶&lt;br&gt;University of Bologna</td>
<td><strong>High Transmission Efficiency Metasurface-based Spiral Phase Plate for Generating Vortex Waves</strong>&lt;br&gt;Li Yu⁵, Zhang Qi⁶, Hao Zhu⁶, Xuping Li⁷&lt;br&gt;School of Electronic Engineering, Beijing University of Posts and Communications</td>
<td><strong>UHF Near-Field Wireless RFID Power Transfer Through Two Distant Rectangular Waveguides</strong>&lt;br&gt;Ioanaia Păunul, Mihaela Piroi, Iaroslav Abramov⁷, Siras Idelma⁸, Small Tai⁹&lt;br&gt;¹Grenoble-INP, ²University Grenoble Alpes</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>13:50</td>
<td>EuRAD02</td>
<td>Innovative Radar Classification Techniques</td>
<td>Chair: Pierfrancesco Lombardo¹, Co-Chair: Laura Anton² ¹Sapienza University of Rome, ²TNO Defense, Safety and Security</td>
</tr>
<tr>
<td>14:10</td>
<td>EuMC25-1</td>
<td>Antenna Array Driven by Non-Isolated Power Amplifiers for MIMO Applications</td>
<td>Heijun Fan¹, Yuan Ding¹, George Gousses³, Maria Jesus Canavate Sanchez³ ¹Hensoldt University, Edinburgh</td>
</tr>
<tr>
<td>14:10</td>
<td>EuRAD02-2</td>
<td>Surface Classification with Millimeter-Wave Radar Using Temporal Features and Machine Learning</td>
<td>David Montgomery¹, Gaston Holmér², Andreas Jakobsson³, Peter Almers¹ ¹Acconeer, ²Sigma, ³Centre for Mathematical Sciences, Lund University</td>
</tr>
<tr>
<td>14:30</td>
<td>EuMC25-2</td>
<td>A Compact Micro-Diversity Module with Integrated Antenna Set for Automotive Satellite Radio Reception</td>
<td>Simon Sørensen¹, Sebastian Matthei¹, Stefan Lindenmeier¹ ¹Universität der Bundeswehr München</td>
</tr>
<tr>
<td>14:30</td>
<td>EuRAD02-3</td>
<td>Projection Metric Learning of Updated-Subspaces for Radar Target Classification</td>
<td>Ryoma Yataka¹, Kazuki Hirashima¹, Takahumi Matsuda¹, Tai Tanaka¹, Masato Gochi¹, Masashi Shinoka¹ ¹Mitsubishi Electric Corporation</td>
</tr>
<tr>
<td>14:30</td>
<td>EuMC25-3</td>
<td>A 28 GHz 8-channel Fully Differential Beamforming IC in 65nm CMOS Process</td>
<td>Jeongsoo Park¹, Donghyun Baek¹, Jeong-Geun Kim¹ ¹Kwangwoon University, ¹Chung-Ang University</td>
</tr>
<tr>
<td>14:30</td>
<td>EuRAD02-4</td>
<td>Clutter-compensating Adaptive Waveforms with Cognitive Radar for Target Classification using EM-Simulated Ground-Based RCS Responses</td>
<td>Muhoon Bin Bai¹, Rooyens³ ¹Naval Postgraduate School</td>
</tr>
<tr>
<td>14:30</td>
<td>EuMC25-4</td>
<td>A 25-40 GHz 180° Reflective-Type Phase Shifter using 65 nm CMOS Technology</td>
<td>Jeong-Taek Lim¹, Sungjo Cho¹, Eun-Gyu Lee¹, Han-Young Cho¹, Jee-Hyok Song¹, Sang-Hyo Kim¹, Cho-Yeong Kim¹ ¹Chungnam National University</td>
</tr>
<tr>
<td>15:10</td>
<td>EuRAD02-5</td>
<td>Learning Dynamic Processes from a Range-Doppler Map Time Series with LSTM Networks</td>
<td>Marco Almario¹, Peter Ott¹, Nicolaj C. Stache¹, Christian Waldschmidt² ¹Hochschule Heilbronn, ²University of Ulm</td>
</tr>
<tr>
<td>15:10</td>
<td>EuMC25-5</td>
<td>V-band Vector-sum Phase Shifter with Frequency Mixing</td>
<td>Shinya Yokomizo¹, Aihito Hirai¹, Takando Fujimori¹, Makutomi Tsuru¹ ¹Mitsubishi Electric Corporation</td>
</tr>
<tr>
<td>EuMC27-1</td>
<td>EuMC28-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluation of DPD Algorithm Thanks to System-Level Behavioral Modelling</td>
<td>Measurement and Modeling Techniques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wissam Saabe¹</td>
<td>David E. Root¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*AMCAD Engineering</td>
<td>Keysight Technologies, Inc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EuMC27-2</th>
<th>EuMC28-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>GaN Digital Outphasing PA</td>
<td>Linearity and Efficiency Characterization of AlGaN/GaN and InAlGaN/GaN HEMTs devices using Multi-tone Large Signal Measurements</td>
</tr>
<tr>
<td>Thomas Hoffmann², Wolfgang Heinrich¹, Andreas Wentzel¹, Florian Hühn¹</td>
<td>Vincent Gillet¹, Mohamed Bouslama¹, Stéphane Piotrowicz², Clément Piot¹, Olivier Pierrat¹, Michel Pignoli¹, Jean-Christophe Nubel¹, Christoph Chang¹, Raymond Quere¹</td>
</tr>
<tr>
<td>*Ferdinand-Braun-Institut (FBH)</td>
<td>*XLIM Research Institute - UMR CNRS 7252, *Centre National d’Études Spatiales (CNES)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EuMC27-3</th>
<th>EuMC28-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Experimental Study for the Design of Dual Input Load Modulated Wideband GaN Amplifier</td>
<td>Wide-band Large VSWR On-Wafer Standards for Harmonic Load-Pull System Calibration</td>
</tr>
<tr>
<td>Alexis Court¹, Tissaul Reveyrand¹, Pierre Medra¹, Philippe Bouyais¹, Jean-Michel Niblot¹, Geoffrey Staebaert-Pol¹, Luc Lapierre¹</td>
<td>Yuzhe Yin¹</td>
</tr>
<tr>
<td>*XLIM Research Institute - UMR CNRS 7252, *Centre National d’Études Spatiales (CNES)</td>
<td>*China Electronics Standardization Institute</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EuMC27-4</th>
<th>EuMC28-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 60-GHz Symmetric Doherty Power Amplifier with 20.4% 6-dB Back-off Efficiency</td>
<td>Improving Wafer-Level S-parameters Measurement Accuracy and Stability with Probe-Tip Power Calibration up to 110 GHz for 5G Applications</td>
</tr>
<tr>
<td>Masahiro Tan¹, James Buckwalter¹, Kang Ning¹</td>
<td>Choon Beng Sia¹</td>
</tr>
<tr>
<td>*NEC Corporation, *University of California, Santa Barbara</td>
<td>*FormFactor Inc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EuMC27-5</th>
<th>EuMC28-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 Watt Sequential Power Amplifier Using Inverted Doherty-Type Active Load Modulation with 50% Efficiency at 10dB Back-off over 23% Fractional Bandwidth</td>
<td>Robust One-Tier Calibration for Microwave Microfluidics using Unknown Liquids</td>
</tr>
<tr>
<td>Florian Dietrich¹, Mah-Dey Wan¹, Renato Negra¹</td>
<td>Pawel Barmuta¹, Jinhoong Bae¹, Tomáš Markovič¹, Arkadiusz Lewandowski¹, Meng Zhang¹, Bart Nauwelaers¹, Dominique Schneers¹, Ilya Cickel¹,²</td>
</tr>
<tr>
<td>*RWTH Aachen University</td>
<td>*KU Leuven, *Warsaw University of Technology, *IMEC</td>
</tr>
<tr>
<td>Time</td>
<td>EuMC29</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>16:10</td>
<td>Techniques and Technologies for the Enhancement of WPT Systems</td>
</tr>
<tr>
<td></td>
<td>Chair: Luciano Tarricone¹</td>
</tr>
<tr>
<td></td>
<td>Co-Chair: Martino Aldrigo²</td>
</tr>
<tr>
<td></td>
<td>¹University of Salento, ²IMT</td>
</tr>
<tr>
<td>16:30</td>
<td>EuMC29-1 Efficient Assessment of the Impact of Metallic Obstacles on the Wireless Power Transfer in Loosely Coupled Links</td>
</tr>
<tr>
<td></td>
<td>Benjamin Deutschmann¹, Lukas Göttschacher⁴, Peter Piller⁵, Jasmin Grosinger⁶</td>
</tr>
<tr>
<td></td>
<td>¹Graz University of Technology, ⁴AVL List GmbH</td>
</tr>
<tr>
<td>16:50</td>
<td>EuMC29-2 Gains Maximization for Two–port WPT Links with Three Coils</td>
</tr>
<tr>
<td></td>
<td>Franco Mast⁸, Mauro Mangiardi⁹, Giuseppina Muni⁵, Luciano Tarricone⁼</td>
</tr>
<tr>
<td></td>
<td>⁸University of Bologna, ⁹University of Perugia, ⁵University of Salento</td>
</tr>
<tr>
<td>17:10</td>
<td>EuMC29-3 Wireless Composite Right/Left-Handed TransmissionLine Sensor for Permittivity Measurements</td>
</tr>
<tr>
<td></td>
<td>Amrit Zoad¹</td>
</tr>
<tr>
<td></td>
<td>¹THM</td>
</tr>
<tr>
<td>17:30</td>
<td>EuMC29-4 A 2.4 GHz-Band Enhancement-Mode GaAs HEMT Rectifier with 19% RF-to-DC Efficiency for 1 μW Input Power</td>
</tr>
<tr>
<td></td>
<td>Ryo Inukawa¹, Tsurushi Yoshida¹, Kazuhiko Horig¹</td>
</tr>
<tr>
<td></td>
<td>¹The University of Electro-Communications, Chofu, Tokyo, Japan</td>
</tr>
<tr>
<td>17:50</td>
<td>EuMC29-5 A 2.45-GHz Self-Synchronous GaN FET Rectifier Using CRHL-TL-Based Gate Control Circuit</td>
</tr>
<tr>
<td></td>
<td>Shinichi Tanaka¹, Takanori Noguchi¹</td>
</tr>
<tr>
<td></td>
<td>¹Shibaura Institute of Technology</td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>16:10</td>
<td>E07</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>16:30</td>
<td>E08</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>16:50</td>
<td>E09</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>17:10</td>
<td>E10</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>17:30</td>
<td>E11</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>17:50</td>
<td>E12</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>18:10</td>
<td>E13</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td>E14</td>
</tr>
<tr>
<td>18:50</td>
<td>E15</td>
</tr>
</tbody>
</table>
EuMC33
Microwave Sensing for Biomedical Applications
Chair: Katia Gruner¹
Co-Chair: Iija Ocker²
¹LAAS-CNRS, ²IMEC

EuMC34
Metasurface Based Antennas and Absorbers
Chair: Francesco Medina¹
Co-Chair: Anrikanami Aphiwes²
¹University de Sevilla, ²Nanyang Technological University

EuRAD04-1
Holographic Metasurface Antennas Enabling Mobile 5G Satellite Connectivity
Mohsen Sazegar¹
Kymeta Corporation

EuRAD04-4
Design of a mm-wave MIMO Radar Demonstrator with an Array of FMCW Radar Chips with On-Chip Antennas
R ̇abi ̇Za ̇nab Syed³, Bedul Adsas, Marijn Van Beurden¹, Paul van Zijl², Bart Smolders¹
¹Eindhoven University of Technology - TUE, ²Evoelectronics, ³Sapienza University of Rome

EuMC34-3
Non-periodic Metasurface Beam Splitter for Dual Polarizations
Cheng Tao¹, Tatsumo Itoh¹
¹University of California Los Angeles (UCLA)

EuMC34-6
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015

EuMC34-7
A Novel Approach for a MIMO FMCW Radar System with Frequency Steered Antennas for 3D Target Localization
Alexandra Orth¹, Patrick Hanakowsky², Nils Pohl¹
¹Ruhr-Universität Bochum, ²University of Kassel

EuMC33-1
Electrically Controlled Tunable Broadband Interferometric Dielectric Spectroscopy Groundwork for Single Cell Analysis
Meng Zhang¹, Iija Ocker², Pawel Bartula³, Juncheng Bao¹, Xue Bai¹, Hu Yang¹, Bart Nauwelaers¹
¹University of Leuven, ²IMEC, ³Warsaw University of Technology

EuMC34-1
An Approach to Improve the Sub-THz Band for Microwave Sensing and Imaging
Mohsen Sazegar¹
Kymeta Corporation

EuRAD04-3
Wideband Spectrum Estimation in Frequency Dense Environments
Mario La Manna¹, Pietro Monsarrat², Pasquale Tommasso³, Alessandro Trifiletti²
¹Elettronica, ²Sapienza University of Rome, ³Sapienza University of Rome

EuMC33-2
A Transmission Line Based Microwave Heater at 25 GHz for Continuous Flow Microfluidics Fabricated on Silicon
Tomislav Markovic¹, Tomislav Markovic², Bart Nauwelaers¹
¹University of Leuven, ²KU Leuven & IMEC

EuMC34-2
A 60GHz Wideband Antenna Array Based On Metasurface With Gap Waveguide (GWG) Devider
Shiro Chenyun¹, Cui Jie¹, Sheng Weixing¹, Han Yingzi¹
¹Nanjing University of Science and Technology

EuMC34-5
Wideband Metal-Dielectric Multilayer Absorber based on a Single Step FDM Process
Thi Hoai Van-Hoang¹, Hoang Le-Ngoc³, Romain Greit¹, Brigitte Loeuse³, Didier Lippens³
¹Thales Research & Technology (TRT), ²Institute of Electronics Microelectronics and Nanotechnology

EuMC34-4
On the Calibration of mm-wave MIMO Radars Using Sparse Antenna Arrays for DoA Estimation
Andrei Guret¹, Dominik Schwarz¹, Fabian Ross¹, Philipp H ̈oger¹, Stephen Bucher¹, Patrick Gruner¹, Christian Waldschmidt¹
¹Universität Stuttgart

EuMC34-8
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015

EuMC34-9
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015

EuMC34-10
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015

EuMC34-11
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015

EuMC34-12
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015

EuMC34-13
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015

EuMC34-14
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015

EuMC34-15
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015

EuMC34-16
An Ultrathin Quad-band Microwave Absorber with Small Frequency Ratio
Adeline Melinta, Kathiravan S S², Damodharan P³
¹Indian Institute of Information Technology Design & Manufacturing, Kancheepuram, Chennai 600127, ²National Institute of Technology Trichirappalli, Trichirappalli 620015
THURSDAY

EuMC35  
SW Technology for Passive Components  
Chair: Magdalena Salazar-Palma¹  
Co-Chair: Hervé Leblond²  
¹Universidad Carlos III de Madrid, ²Thales Alenia Space en France

EuMC36  
Supply Modulated Power Amplifiers  
Chair: Olof Bengtsson¹  
Co-Chair: Paul Tasker²  
¹Ferdinand-Braun-Institut, ²Cardiff University

EuMC37  
Phased Array Systems  
Chair: Laure Huitema¹  
Co-Chair: Wim van Cappellen²  
¹Université de Limoges, CNRS, XLIM UMR 7252, ²ASTRON

EuMC35-1  
Evolution of Passive Microwave Engineering driven by Technology, Simulation and Market Demand  
Marin Siegbert¹  
¹TESAT

EuMC36-1  
Discrete Supply Modulation of a Three-Stage K-Band PA  
Markus Dibi¹, Gregor Lasser¹, Zoya Popovic¹  
¹CU Boulder

EuMC37-1  
Optically-Controlled Unit-Cell for Transmitarrays at X-band  
Romain Cane¹·², Ronan Sauleau¹, Mehdi Alouini²  
¹Institut d’électronique et de télécommunications de Rennes, IETR, ²INSTITUT FOTON - DOP

EuMC35-2  
SIW-Based Planar Orthomode Transducer for 28 GHz Applications  
Sergey Chukin¹, Andrey Mashanovskiy¹, Oleg Soykin¹, Alexey Artemenko¹, Ruman Maslenkov²  
¹Radio Gigabit LLC

EuMC36-2  
Packaged Floating-Ground RF Power GaN-HEMT  
Sajad Paul¹, Ga Nguyen Phung¹, Wolfgang Heinrich¹, Olof Bengtson¹  
¹Ferdinand-Braun Institut

EuMC37-2  
Broadband Connected Slots Phased Array Feeding a High Gain Lens Antenna at 60 GHz  
Imran Aziz¹, Erik Cefaire¹, Robin Dahlbäck¹, Anders Rydberg¹, Gunnar Englund¹, Dragos Dancila¹  
¹Univ. Limoges, CNRS, XLIM, UMR 7252, F-87000 Limoges, France, ²DELAIR

EuMC35-3  
AF3IW Termination with Full- and Partial-Height Absorbing Material Loading  
Iasem Marati¹, Anthony Ghittor², Jean Marie Pham³, Tihem Marati¹, Aurelie Bousay¹  
²Coham Microwave, ³Bordeaux INP, IMS Laboratory, University of Bordeaux

EuMC36-3  
Impact of the Input Impedance on the Linearity of Supply Modulated GaN HEMT Power Amplifiers  
Alexander Ali¹, Peng Chen¹, Sattam Fahd-Alshahwi¹, Guangdong Wang¹, Roberto Quaglia¹·², Paul Tasker¹, Jonathan Lees¹  
¹Cardiff University

EuMC37-3  
Active Ka-Band Radiator  
Philip Kohl¹, Alexander Sommer¹, Michael Kistler¹, Benjamin Fall¹, Julian Lerche¹  
¹Airbus Defence & Space, ²Tesat Spacecom GmbH & Co. KG

EuMC35-4  
A Connectorized X-Band 3-D Printed Air-Filled Self-Suspended Rectangular Coaxial Transmission Line  
Yang Yu¹, Ji Li¹, Cheng Guo², Guan-Long Huang², Qinghua Cheng³, Anran Zhang³  
¹Southern University of Science and Technology, ²Shenzhen University, ³Xi’an Jiaotong University

EuMC36-4  
Supply Modulator Ripple in Envelope Tracking Systems - Effects and Countermeasures  
Sattam Fahd-Alshahwi¹·², Alexander Ali¹, Peng Chen¹, Guangdong Wang¹, Paul Tasker¹, Jonathan Lees¹  
¹Cardiff University

EuMC37-4  
Low Cost S-band Beamsteering Antennas for Long Range Professional UAV  
Paul Teillet¹, Marc Thevet¹, Cyrille Ménudier¹, Pierre-Yves Fubouzon¹  
¹Univ. Limoges, CNRS, XLIM, UMR 7252, F-87000 Limoges, France, ²DELAIR

EuMC35-5  
A Multi-mode Waveguide with Mode Selective Effect  
Kien Ng⁴, Xia-Chun Lu⁴, Jun-Fa Mao⁴  
⁴Shanghai Jiao Tong University

EuMC36-5  
Co-designed Handset Antennas with Wide Angular mm-Wave Coverage and LTE MIMO  
Jost Kuninen¹, Henri Kärkiönen¹, Antti Lehtonen¹, Juha Al-launamaki¹, Ville Vikan¹  
¹School of Electrical Engineering, Aalto University.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Affiliations</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:50 - 11:10</td>
<td>E01</td>
<td>EuMC38-1 A Superheterodyne 300 GHz Wireless Link for Ultra-Fast Terahertz Communication Systems</td>
<td>Iulia Dră, Guillaume Ducoumeur, Shintaro Hosakawa, Paola Szilfger, Raf-Peter Braun, Ingmar Kalfiss</td>
<td>Universität Stuttgart, Université de Liège, I ±G, University of Bremen, &quot;DEUTSCHE TELEKOM AG</td>
</tr>
<tr>
<td>11:10 - 11:30</td>
<td>E01</td>
<td>EuMC38-2 A Study on 10G/s Data Transmission Rate with Umost Frequency Efficiency in MIMO System</td>
<td>Tong Yang</td>
<td>China Academy of Space Technology</td>
</tr>
<tr>
<td>11:30 - 11:50</td>
<td>E01</td>
<td>EuMC38-3 Implementation of RF Communication Subsets on Common Low Frequency Clocked FPGA</td>
<td>Moaibab Masri, Ahmad Alami, Elenne Perri, Romain Siragusa, David Hely, Nicolas Barrot, Maxime Gnerier, Frédéric Gare</td>
<td>Université Politecnica de Madrid, Universidad de Málaga, LAAS-CNRS</td>
</tr>
<tr>
<td>11:50 - 12:10</td>
<td>E01</td>
<td>EuMC38-4 System Modeling and Simulation in 5G: A Hybrid Beamforming Approach With Power Flux Equalization in the Elevation Plane</td>
<td>Salman Saman, Yarin Askin, Jan Pustely, Antone Rodqerm, Alexander Yaroney</td>
<td>&quot;Deft&quot; University of Technology</td>
</tr>
<tr>
<td>10:50 - 11:10</td>
<td>E02</td>
<td>EuMC/EuRAD05-1 Understanding Stealth: RCS Fundamentals – from Design to Measurements</td>
<td>Sylvain Morvan</td>
<td>CEA</td>
</tr>
<tr>
<td>11:10 - 11:30</td>
<td>E02</td>
<td>EuMC/EuRAD05-2 Co-polarized bi-Static RCS Measurements of Vulnerable Road Users Between 1 and 10 GHz</td>
<td>Andreas Schwind, Sreenar Budhappagari Jayapal Goody, Willi Hofmann, Ralf Stephan, Reiner Thoma, Matthias Hein</td>
<td>Technische Universität Ilmenau</td>
</tr>
<tr>
<td>11:30 - 11:50</td>
<td>E02</td>
<td>EuMC/EuRAD05-3 Monostatic RCS Measurements of a Passenger Car Mock-up at 77 GHz Frequency in Virtual Environment</td>
<td>Sreenar Budhappagari Jayapal Goody, Andreas Schwind, Ralf Stephan, Matthias Hein</td>
<td>Technische Universität Ilmenau</td>
</tr>
<tr>
<td>11:50 - 12:10</td>
<td>E02</td>
<td>EuMC/EuRAD05-4 Low Terahertz Signal Backscattering from Rough Surfaces</td>
<td>Aleksandr Bystryov, Edward Hoare, Marina Gashinova, Thuy-Yung Tran, Mikhail Chernikov</td>
<td>University of Birmingham, Jaguar Land Rover, &quot;Deft&quot; University of Technology</td>
</tr>
<tr>
<td>12:10 - 12:30</td>
<td>E02</td>
<td>EuMC/EuRAD05-5 Permittivity Estimation of Rough Dielectric Surfaces by means of Polarimetric Bistatic Measurements at Millimeter Wave Frequencies</td>
<td>Kai Ben Khadhra</td>
<td>IEEE S.A.</td>
</tr>
<tr>
<td>10:50 - 11:10</td>
<td>E03</td>
<td>EuMC39-1 Microstrip Lines Loaded with Metamaterial-Inspired Resonators for Microwave Sensors/Comparators with Optimized Sensitivity</td>
<td>Jonathan Muñoz-Enano, Paris Vélez, Marta Góp, Javier Mala-Contreras, Kala Grenier, David Dubuc, Fernan Martin</td>
<td>Universitat Autonoma de Barcelona, Universidad Politécnica de Madrid, Universidad de Málaga, &quot;EAS-CNRS</td>
</tr>
<tr>
<td>11:10 - 11:30</td>
<td>E03</td>
<td>EuMC39-2 Simple Laminated PCB Artificial Dielectrics for mm-Wave Quasioptical Lenses</td>
<td>David S. Roberts, Michael Arch</td>
<td>North Carolina State University</td>
</tr>
<tr>
<td>11:30 - 11:50</td>
<td>E03</td>
<td>EuMC39-3 Reflectionless Microwave Quarter-Wave Plate Using Hyperbolic Metamaterials</td>
<td>Ryo Mochizuki, Naoki Shinoara, Atsuoi Sarae</td>
<td>Kyoto University, Osaka University</td>
</tr>
<tr>
<td>12:10 - 12:30</td>
<td>E03</td>
<td>EuMC39-5 Circuit Modelling of Metallic Dual-Band Dual-Polarized FSS</td>
<td>Carlos Madero Jimenez, Edilberto Meran, Tomislav Djevicevic, Maria Garcia Vigueira</td>
<td>&quot;ETR, INSA Rennes, &quot;SWISSst12</td>
</tr>
</tbody>
</table>

**Thursday**

**EuMC38**

**Communications Systems**

Chair: Alexander Koelpin¹
Co-Chair: Fabian Lurz²
¹Brandenburg University of Technology, ²Friedrich-Alexander University Erlangen-Nürnberg (FAU)

**EuMC39**

**Metamaterial Based Devices**

Chair: Ferhat Martín¹
Co-Chair: Jan Machac²
¹Universitat Autonoma de Barcelona, ²Czech Technical University in Prague
EuRAD05
Signal Processing for Positioning, Calibration and Antenna Steering
Chair: Laurent Pierro-Faiss¹
Co-Chair: Debra Pastinia²
¹University of Rennes 1, ²University of Rome La Sapienza

EuMC40
3D Printing and Additive Manufacturing Techniques For RF-Components
Chair: Kamal Samanta¹
Co-Chair: Raafat Mansour²
¹Sony Europe, ²University of Waterloo

EuMC/EuRAD06
Integrated Antennas and Systems-in-Package
Chair: David Pretiolo
Co-Chair: Claire Migliaccio¹
¹Université Côte d’Azur

EuRAD05-1
External Calibration of Antenna Pointing and Positions in Airborne SAR Systems
Nina Schreiner¹, Wolfgang Sauer-Greff¹, Ralph Urbanek², Fabian Friederich³
¹Fraunhofer IWM, ²TU Kaiserslautern

EuMC40-1
3D Printed Copper Waveguides by Selective Electron Beam Melting Process for E-Band
Konstantin Lomakin¹, Ralf Guschlbauer², Fuad Osmanlic², Zongwen Fu², Mark Sippel¹, Klaus Helmreich¹, Carolin Körner¹, Martin Vossiek¹, Gerald Gold¹
¹Friedrich-Alexander University Erlangen-Nürnberg (FAU), ²Zentralinstitut für neue Materialien und Prozesstechnik (ZMP)

EuMC/EuRAD06-1
122 GHz FMCW Radar System-in-Package in LTCC Technology
Alkaishma Bhutani¹, Benjamin Goettel¹, Marco Pauli¹, Thomas Zwick²
¹Karlsruhe Institute of Technology, ²Wellenorth GmbH & Co. KG

EuRAD05-2
Analyzing the Precision of Frequency Modulated Continuous Wave Distance and Thickness Measurements
Nina Schreiner¹, Wolfgang Sauer-Greff¹, Ralph Urbanek², Fabian Friederich³
¹Fraunhofer IWM, ²TU Kaiserslautern

EuMC40-2
Optimizing the Conductivity of Ink-Jet Printed Microwave Components on Polymer Substrates by Laser Sintering
Chaimaa El Hajjaji¹,², Julien George¹, Souhayl Lmansouri¹, Nicolas Delhote¹, Nicolas Demers¹, Bernard Denis², Sébastien Frey², Olivier Bougis²
¹XLIM UMR7252, Université de Limoges-CNRS, Limoges, FRANCE, ²CTTC

EuMC/EuRAD06-2
Sub-array Optimization for Compactness Improvement of a 3D Printed Adaptive Phased Array Antenna Operating in Ku-band
Sara Abed-Elrahman¹, Rizwan Masri², Cedric Guenon¹, Arnaud Martin-Guenon¹, Julian Haurani¹,², Gwendal Cochef³, Yves Quere¹, Thomas Merlet³
¹LABSTICC-UBO, ²Elliptika, ³Thales LAS

EuRAD05-3
Improving Phaseless Direction of Arrival Estimation Exploiting Space and Frequency Diversities
Alessandro Colombi¹, Giovanni Colbod², Matteo Lucarel³, Stefano Maddio¹, Marco Passaluffe¹, Giuseppe Piallo¹, Stefano Solieri¹
¹University of Florence

EuMC40-3
Complex Structures in Microwave Circuits by Using Additive Manufacturing Techniques
Héctor García-Martínez¹, Gemín Tomgorossi², Enric Riera³, Annaig Martin-Guennou¹, Julien Haurani¹,², Gwendal Cochef³, Yves Quere¹, Thomas Merlet³
¹LABSTICC-UBO, ²Elliptika, ³Thales LAS

EuMC/EuRAD06-3
Assessment of a Contactless Characterization Method for Integrated Antennas
Teun van den Biggelaar¹, Daan Daverveld¹, Ulf Johannsen¹, Bart Smolders¹
¹Eindhoven University of Technology

EuRAD05-4
System Concept for Association and Positioning of Vehicles using SAW RFID Tags
Pau Calders¹, Dominik Ziewe²
¹Sennova Mobility GmbH, ²University of Erlangen-Nuremberg

EuMC40-4
An Integrated Monobloc 3D Printed Frond-end in Ku band
Fabien Le Borgne¹, Gwendal Cochet¹, Julien Haurani¹,², Danilo-Lamine Ouedir¹, Killian Donnat³, Alexandre Manche³
¹Elliptika, ²Lab-STICC UBO

EuMC/EuRAD06-4
Performances of Magneto-Electric Dipoles in an Antennas Array with a Reduced Beam Forming Network
Abdul-Gadir Kadour¹, Jorick Milbrandt¹, Cyril Meunier¹, Marc Thévenot¹, Philippe Pouligny², Patrick Potier², Maxime Romier³
¹XLIM Research Institute - UMR CNRS 7252, ²DGA (Direction Générale de l’Armement), ³Centre National d’Études Spatiales (CNES)

EuRAD05-5
Uncoupled FDA Beamsetter Synthesis by Discrete Element Position and Frequency Offsets Pairing
Xiangrong Wang¹, Qian Long²
¹Beihang University

EuMC40-5
Additive Layer Manufactured Waveguide RF Components
Michael Kilian¹, Andreas Schrenzl-Wöhl², Philipp Kol³, Alexander Sommer¹, Christian Hartwanger¹, Michael Schneider¹
¹Airbus Defence & Space

EuMC/EuRAD06-5
Millimeter-wave System-in-Package (SiP) for Non-Destructive Testing of Metallic Structures under Multilayered Composites using Backward-to-Forward Beamscanning Leaky Wave Antenna
Karthik Thothathri¹, Chandrashekara⁴, Neeraj Khanna⁵, Steve Wang Lo⁶, Chen Kuan Sim⁶, Be Lin⁶, Muhammad Fares Kame⁷, Ahmad Amran⁸, Kurt Aigner⁹, Michael Ong Ling Chuan¹⁰, National University of Singapore
¹Airbus Defence & Space, ²National University of Singapore, ³University of Erlangen-Nuremberg, ⁴Chipsone, ⁵Arvind Wireless, ⁶Nanyang Technological University, ⁷DGA (Direction Générale de l’Armement), ⁸Centre National d’Études Spatiales (CNES), ⁹National University of Singapore, ¹⁰Nanyang Technological University, Institute of Infocomm and Research, National University of Singapore
EuMC/EuRAD07-1
Scattering by Infinite Graphene Strip Grating with Brake of Periodicity
Mstyslav Kaliberda¹, Leonid Lytvynenko², Sergey Pogarsky²
¹V.N. Karazin-Kharkiv National University, ²Institute of Radio Astronomy of the National Academy of Sciences of Ukraine

EuMC/EuRAD07-2
EMC Conducted Emission Analysis of a 3D Multilayer Printed Circuit Board with Kron’s Method
Zhifei Xu¹, Yang Wu², Brian Kao¹, Oliver Maurice², Jonathan Gardner³, Nicolas Marie⁴, Benoît Aymar⁴, Stephane Sarnet⁵
¹ESIGELEC, ²Ariane Group, ³Valéo Géo, ⁴SCIENTEAMA, ⁵FILIX SAS

EuMC/EuRAD07-3
Analysis of Microwave Backscattering from Nonlinear Sea Surface with Currents
Xiang Su¹, Xiaoxiao Zhang², Xiaomin Tan¹, Hongxing Dang¹
¹China Academy of Space Technology, Xi’an Branch, ²Xi’an University of Post & Telecommunications

EuMC/EuRAD07-4
Impact of Non-idealities on the Performance of Delta-Sigma/Manchester-modulated Microwave signals
Seunghyun Jang¹
¹ETRI

EuMC/EuRAD07-5
Implementation of a Four-Way Amplitude Modulated Mixerless Transmitter
Peco Gjurovski¹, Muh-Dey Wei¹, Renato Negra¹
¹RWTH Aachen University

EuMC/EuRAD07-6
An Open-Source Speech Codec at 450 bit/s with Pseudo-Wideband Mode
Stefan Erhardt¹, Thomas Kurmi¹, Fabian Ludt², Robert Wöpf³, Alexander Kosjek³
¹Friedrich-Alexander-University Erlangen, ²Brandenburg University of Technology

EuMC/EuRAD07-7
Azimuth Pattern Reconfigurable Magnetic Dipole Antenna with Wide-Angle Coverage
Hyunryang Choi¹, Soo-Chang Chae¹, Jong-Sang Yoo¹, KwangBook Kim², Jong-Won Yu²
¹ Korea Advanced Institute of Science and Technology

EuMC/EuRAD07-8
A Compact Magnetic Multipole Antenna for Wide 2-Dimensional Beamwidth
Ye-Jun Kim¹, Hyun-Jun Dong¹, Cheol-Ung Lee¹, Han Lim Lee¹
¹Chung-Ang University

EuMC/EuRAD07-9
Design and Study of Meshed and Optically Transparent Dipole Antennas at 2.45 GHz
Maxime WAIRZYNAK¹, Julien Brat¹, Aurere Demoulin¹, Tri-Phu Vuong¹
¹MIP AVN, Grenoble, Laboratory of Pulp & Paper Science

EuMC/EuRAD07-10
High Gain and Broadband Quasi Horn Antenna Array for Ku Band Mobile TV Antenna Systems and Monopulse Radiation
Mehmet Ali TULLU²
¹Netra Elektronik A.Ş.

EuMC/EuRAD07-11
Dual-Band Open Metal Waveguide Slot Antennas
Vladimir Veremyev¹
¹Işık Teknoloji

EuMC/EuRAD07-12
High Self-Interference Mitigation Achieved thanks to Significant Antenna Isolation and Advanced RF Front-End for In-Band Full-Duplex Communications
Camille Jouvaud¹, Patrick Rosson¹, David Dassonville¹
¹CEA - LETI

EuMC/EuRAD07-13
An Investigation of the Influence of Nonlinear Distortion and Null Stability on Spatial Multiplexing Performance using 4.65 GHz Active Antenna System with DPD
Makoto Hayakawa¹, Takuji Mochizuki¹, Masashi Hirabe¹, Tomohiro Kikuma¹, Daisuke Nose¹
¹NEC Corporation

EuMC/EuRAD07-14
A Tiled C-Band Dual-Polarized 1-Bit Transmitarray
Irina Munina¹, Pavel Turalchuk¹, Alexey Shitvov², Dmitry Zelenchuk³, Alexander Verevkin¹, Vitaly Koltov⁴
¹Saint Petersburg Electrotechnical University “LETI”, ²Cardiff University, ³Queen’s University Belfast

EuMC/EuRAD07-15
An Antenna Diversity and Combining System for Improved Mobile GNSS Reception
Sebastian Mattelhe¹, Simon Senega¹, Stefan Lindenmeier¹
¹Institut für Hoch- und Höchstfrequenztechnik der Universität der Bundeswehr München

EuMC/EuRAD07-16
An Antenna Diversity and Combining System for Improved Mobile GNSS Reception
Sebastian Mattelhe¹, Simon Senega¹, Stefan Lindenmeier¹
¹Institut für Hoch- und Höchstfrequenztechnik der Universität der Bundeswehr München

EuMC/EuRAD07-17
AmmnWave Beamformer Chips with Smart- Antennas for 5G: Toward Holistic RFSoI Technology Solutions including RF-ADCs
Sidina Wane¹, Pablos Comba¹, Tanh Vinh Dinh¹, Johannes Russer¹, Michael Hadler¹, Francois Clement¹, Breuc Turuchêt¹, Su Wei Chang¹, Chueh-Jen Lin¹, Wen-Tao Tsai¹, ricardo Giaconelli¹, Nicolas Gris¹
¹A- Technologies, ²TIM/TEK, ³Keysight Technologies, ⁴InV

EuMC/EuRAD07-18
AmmnWave Beamformer Chips with Smart- Antennas for 5G: Toward Holistic RFSoI Technology Solutions including RF-ADCs
Sidina Wane¹, Pablos Comba¹, Tanh Vinh Dinh¹, Johannes Russer¹, Michael Hadler¹, Francois Clement¹, Breuc Turuchêt¹, Su Wei Chang¹, Chueh-Jen Lin¹, Wen-Tao Tsai¹, ricardo Giaconelli¹, Nicolas Gris¹
¹A- Technologies, ²TIM/TEK, ³Keysight Technologies, ⁴InV
EuMW02
EuMW/EuMC Closing Session

Chair: Denis Barataud¹
Co-Chair: Stéphane Bila¹, EuMC 2019 Chair

¹XLIM UMR7252, Université of Limoges/CNRS, Limoges, FRANCE

13:50 – 14:00
Session Remarks
Denis Barataud, EuMW 2019 General Chair
Stéphane Bila, EuMC 2019 Chair

14:00 – 14:45
SMOS: A Microwave Instrument in Space
François Deborgies, RF Technology Advisor, TEC-EP, ESA-ESTEC, 2200-AG Noordwijk, The Netherlands

2019 is a landmark for the Soil Moisture and Ocean Salinity (SMOS) mission which was launched on November the 2nd 2009 and was designed for 3 years of operation. SMOS is one of ESA’s Earth Explorer missions, which form the science and research element of the Living Planet Programme. This family of satellite missions addresses key scientific challenges identified by the science community and demonstrate breakthrough technology in observing techniques. The satellite carries a novel instrument: an aperture synthesis radiometer that operates in L-band to capture ‘brightness temperature’ images.

14:45 – 15:15
Awards Ceremony
Eric Bergeault, EuMW2019 Awards Coordination Chair.
Florence Podevin, EuMW2019 Student Activities Coordination Chair
Nathalie Delimpie, EuMW2019 General TPC Chair

EuMC Microwave Prize
EuMC Young Engineer Prizes
Student Challenge Prize
Student Design Competition Prize

15:15 – 15:30
Closing Remarks
Denis Barataud, EuMW 2019 General Chair
Frank van Vliet, EuMW 2020 General Chair

15:30
End of Session
EuRAD06-1
A Novel Detection Method of Unmodulated Radar Pulses in Scenarios with Interference for Digital Wideband ESM Receivers
Aline Oliveira¹, Jorge Pires¹
¹Instituto de Pesquisas da Marinha

EuRAD06-2
A Radar with 3D Imaging Capability that uses Synthetic Aperture in Azimuth and Compressive Sensing MIMO in Elevation
Massimiliano Pieraccini¹, Lapo Miccinesi¹, Neda Rojhani¹
¹University of Florence

EuRAD06-3
Isolines in 3D Radar Images for Remote Sensing Applications
Dominique Henry¹, Hervé Aubert¹
¹LAAS-CNRS

EuRAD06-4
Stepped Frequency IRCI-Free Sliding Spotlight MIMO SAR
Mohammed AlShaya¹, Mehrdad Yaghoobi¹, Bernard Mulgrew¹
¹The University of Edinburgh, ‘King Abdulaziz City for Science and Technology (KACST)

EuRAD06-5
Inter-System Interference Reduction in RadCom Systems - Filter Bank Multicarrier Radar
Jesús Sarmiento¹, Daniel Castanheira¹, Alilo Gamarra¹, Paulo Monteiro¹
¹Instituto de Telecomunicacoes-Aveiro

EuRAD06-6
Wide Swath SAR System Design and Quality Analysis Based on Orthogonal Noise Waveforms
Minjung Moon¹, Woojung Lee¹
¹Korea Aerospace University

EuRAD06-7
Iterative Minimum Entropy Based Algorithm for Phase Noise Removal in FMCW Radars.
Andrzej Drozd¹, Janusz M. Samarski¹, Reinhart Feger¹, Werner Schobholz¹, Andreas Stelzer¹
¹Johannes Kepler University Linz

EuRAD06-8
A High Range-Accuracy Interferometry Radar for Very Small Transponder Positioning
Pei-Yu Lyu¹, Pei-Chi Lo¹, Sheng-Fuh Chang¹, Shih-Cheng Lin¹, Chia-Chen Lin¹
¹National Chung Cheng University, ²National Chia-Yi University

EuRAD06-9
Extracting Vertical Distribution of the Aerial Migratory Animals Using Weather Radar
Kai Cui¹
¹Beijing Institute of Technology

EuRAD06-10
Spectroscopic Estimation of Surface Roughness Depth for mm-wave Radar Sensors
Philipp A. Schell¹, Philipp A. Scherf¹, Hubert Mantz¹, Thomas Walter¹, Christian Waldschmidt¹
¹Ulm University of Applied Sciences, ²Ulm University

EuRAD06-11
A 3D-Printed Saddle Reflector for Upwards-looking Bi-static SAR Snow Radar
Jon Håvard Hetland Erkstad¹, Kristian G Kjetted¹, Tor Sverre Lunde¹
¹University of Oslo

EuRAD06-12
SAR-Like Multi-Input Multi-Output Radar for Naval Applications
Leonardo Lenzo¹, Antonio Malacarne¹, Paolo Greiff¹, Antonella Bogoni¹
¹Scuola Superiore Sant’Anna, ‘Consortio Nazionale Interuniversitario Telecommunicationi (CINT)

EuRAD06-13
Feature Extraction for Classification of Water Surfaces using a 24 GHz CW Radar
Marc A. Mutschler¹, Philipp A. Scherf¹, Hubert Mantz¹, Thomas Walter¹, Christian Waldschmidt¹
¹Ulm University of Applied Sciences, ²Ulm University

EuRAD06-14
Compact Intermodulation Radar for Finding RF Receivers
Jeremy Rauç¹, Alexandre Maitreña¹, Laurent Chausseau¹
¹YES - University of Montpellier, ²Thales SIX

EuRAD06-15
3D Millimetre Wave Screening for Metallic Surface Defect Detection
Sebastian Pawlitzek¹, Reinhold Herschel¹, Nils Pohl¹
¹Ruhr University Bochum

EuRAD06-16
Statistical Approach for Automotive Radar Self-Diagnostics
Nikita Petrov¹, Oleg Krasnov¹, Alexander Yarovoy¹
¹TU Delft

EuRAD06-17
Passive Cooling of mm-Wave Active Integrated 5G Base Station Antennas Using CPU Heatsinks
Yanki Aslan¹, Caner Elci Kiper¹, Antonius Johannes Baggeela², Ulf Johannsen¹, Alexander Yarovoy¹
¹Delft University of Technology, ²TUBITAK SAGE, ³Eindhoven University of Technology
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Keywords</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:10 - 16:30</td>
<td>E01</td>
<td>EuRAD07-1 Compact 76 GHz Automotive Long-Range Radar with High Linearity Chirp Generator Based on Low Phase Noise Open-Loop VCO</td>
<td>Tatsuya Kaminuma¹, &quot;Mitsubishi Electric Corporation</td>
<td>Tatsuya Kaminuma¹, &quot;Mitsubishi Electric Corporation</td>
</tr>
<tr>
<td>16:30 - 16:50</td>
<td>E02</td>
<td>EuRAD08-1 Joint High-Resolution Delay-Doppler Estimation for Bi-static Radar Measurements</td>
<td>Michael Döbereiner¹, Martin Käske², Andreas Schwöbel², Carsten Andrich², Matthias Heir², Reiner Thom³, Giovanni Del Gado³</td>
<td>Michael Döbereiner¹, Martin Käske², Andreas Schwöbel², Carsten Andrich², Matthias Heir², Reiner Thom³, Giovanni Del Gado³</td>
</tr>
<tr>
<td>16:50 - 17:10</td>
<td>E03</td>
<td>EuRAD09-1 An Interference Suppression Method by Transmission Chip Waveform with Random Interpolation in Fast-Chirp FM CW Radar</td>
<td>Yusuke Kishikawa¹, Masashi Maemura¹, Hiroaki Mitani¹, Natsuki Fujii¹, Chihiro Miyazaki¹</td>
<td>Yusuke Kishikawa¹, Masashi Maemura¹, Hiroaki Mitani¹, Natsuki Fujii¹, Chihiro Miyazaki¹</td>
</tr>
<tr>
<td>17:10 - 17:30</td>
<td>E01</td>
<td>EuRAD07-2 Automotive Radar Dataset for Deep Learning Based 3D Object Detection</td>
<td>Michael Meyer¹, Georg Kuschk¹</td>
<td>Michael Meyer¹, Georg Kuschk¹</td>
</tr>
<tr>
<td>17:30 - 17:50</td>
<td>E02</td>
<td>EuRAD08-2 Statistical Characterization of DVB-S Bistatic Clutter for Ground Target Detection</td>
<td>Nerea del Rey-Masé¹, David Mala-Moya¹, María Pilar Jarabo-Amores¹, Pedro José Gómez-del-Hoyo¹, Javier Rosado-Sanz¹</td>
<td>Nerea del Rey-Masé¹, David Mala-Moya¹, María Pilar Jarabo-Amores¹, Pedro José Gómez-del-Hoyo¹, Javier Rosado-Sanz¹</td>
</tr>
<tr>
<td>16:55 - 17:10</td>
<td>E03</td>
<td>EuRAD09-2 A Performance Enhancement Technique for a Joint FMCW RadCom System</td>
<td>Franz Lampel¹</td>
<td>Franz Lampel¹</td>
</tr>
<tr>
<td>17:10 - 17:30</td>
<td>E01</td>
<td>EuRAD07-3 Deep Learning Based 3D Object Detection for Automotive Radar and Camera</td>
<td>Michael Meyer¹, Georg Kuschk¹</td>
<td>Michael Meyer¹, Georg Kuschk¹</td>
</tr>
<tr>
<td>17:30 - 17:50</td>
<td>E02</td>
<td>EuRAD08-3 Passive Radar based on 802.11ac Signals for Indoor Object Detection</td>
<td>Hassan Can Yiğdemir¹, Laurent Storrer¹, Mathieu Van Exchaute¹, Claude Desset², Jérôme Louveaux³, François Horlin³</td>
<td>Hassan Can Yiğdemir¹, Laurent Storrer¹, Mathieu Van Exchaute¹, Claude Desset², Jérôme Louveaux³, François Horlin³</td>
</tr>
<tr>
<td>17:10 - 17:30</td>
<td>E03</td>
<td>EuRAD09-3 Partial Chirp Modulation Technique for Chirp Sequence Based Radar Communications</td>
<td>Mohamad Basim Alabd¹, Benjamin Nuss¹, Christoph Winkler¹, Thomas Zwick¹</td>
<td>Mohamad Basim Alabd¹, Benjamin Nuss¹, Christoph Winkler¹, Thomas Zwick¹</td>
</tr>
<tr>
<td>17:30 - 17:50</td>
<td>E01</td>
<td>EuRAD07-4 A 77 GHz Simulation Study of Roadway Infrastructure Radar Signatures for Smart Roads</td>
<td>Ude Chirengpo¹, Matthew Commens²</td>
<td>Ude Chirengpo¹, Matthew Commens²</td>
</tr>
<tr>
<td>17:10 - 17:30</td>
<td>E02</td>
<td>EuRAD08-4 CFAR Detection applied to MIMO Radar in a Simulated Maritime Surveillance Scenario</td>
<td>Salvatore Maresca¹, Antonella Bogoni¹, Paolo Ghelf², Simona Battaglia²,排毒线路³, Marie-Aude Guérin³, Robert Beek³</td>
<td>Salvatore Maresca¹, Antonella Bogoni¹, Paolo Ghelf², Simona Battaglia²,排毒线路³, Marie-Aude Guérin³, Robert Beek³</td>
</tr>
<tr>
<td>17:30 - 17:50</td>
<td>E03</td>
<td>EuRAD09-4 Radar to Radar Interference in Common Traffic Scenarios</td>
<td>Dilek Tatlar³, Francesco Lagièrêza³, Felke Jansen¹, Alessio Filippi¹, Jeron Oeverdive²</td>
<td>Dilek Tatlar³, Francesco Lagièrêza³, Felke Jansen¹, Alessio Filippi¹, Jeron Oeverdive²</td>
</tr>
<tr>
<td>17:10 - 17:30</td>
<td>E01</td>
<td>EuRAD07-5 Millimeter-Wave FMCW Radar Development using SIW Butler Matrix for Beam Steering</td>
<td>Pascual David Pacheco¹, Cristian-Alexandru Alestrahn², Symon Podbielski², George Goussev³, John Thompson², Jaesup Lee²</td>
<td>Pascual David Pacheco¹, Cristian-Alexandru Alestrahn², Symon Podbielski², George Goussev³, John Thompson², Jaesup Lee²</td>
</tr>
<tr>
<td>17:30 - 17:50</td>
<td>E02</td>
<td>EuRAD08-5 Smart-CFAR, a Machine Learning Approach to Floating Level Detection in Radar</td>
<td>Marco Vezzani¹, Camille Ramirez¹, Ronny Hamers¹, Roslan Trommel¹</td>
<td>Marco Vezzani¹, Camille Ramirez¹, Ronny Hamers¹, Roslan Trommel¹</td>
</tr>
<tr>
<td>17:10 - 17:30</td>
<td>E03</td>
<td>EuRAD09-5 Impact of Phase Noise on Mutual Interference of FMCW and PMCW Automotive Radars</td>
<td>Hasan Can Yiğdemir¹, Marc Baujard¹, André Bourdoux², François Horlin³</td>
<td>Hasan Can Yiğdemir¹, Marc Baujard¹, André Bourdoux², François Horlin³</td>
</tr>
<tr>
<td>Time</td>
<td>EuRAD10-1</td>
<td>EuRAD11-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>-----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:50 - 09:10</td>
<td>EuRAD10-2</td>
<td>EuRAD11-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:10 - 09:30</td>
<td>Micro-Doppler Based Mini-UAV Detection with Low-Cost Distributed Radar in Dense Urban Environment</td>
<td>Layer Determination of Building Structures with SAR in Near Field Environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:30 - 09:50</td>
<td>EuRAD10-3</td>
<td>EuRAD11-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:50 - 10:10</td>
<td>A Realtime Micro-Doppler Detection, Tracking and Classification System for the 94 GHz FMCW Radar System DUSIM</td>
<td>SAR Based Non-Destructive Evaluation of Irregularly Shaped Objects with Simultaneous Estimation of Geometry and Permittivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:10 - 10:30</td>
<td>EuRAD10-4</td>
<td>EuRAD11-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30 - 10:50</td>
<td>Unsupervised Learning using Generative Adversarial Networks on Micro-Doppler Spectrograms</td>
<td>Delamination Thickness Estimation Using Time Domain Microwave Non-destructive Testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:50 - 11:10</td>
<td>EuRAD10-5</td>
<td>EuRAD11-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:10 - 11:30</td>
<td>Target/Clutter Disentanglement using Deep Adversarial Training on Micro-Doppler Signatures</td>
<td>Noninvasive Binary Gas Mixture Measurements with a Millimeter-Wave Low-Cost FMCW Radar System</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EuRAD12
Waveforms and Radar Networks
Chair: Stéphane Méric¹
Co-Chair: Krzysztof Kulpa²
¹Institut d’électronique et de télécommunications de Rennes, IETR, "Warsaw University of Technology

EuRAD12-1
OFDM Waveform for Distributed Radar Sensing in Automotive Scenarios
Steffen Schieler¹, Christian Schneider¹, Carsten Andrich², Michael Döbereiner³, Andreas Schwendt³, Philipp Wendland³, Reiner Thomä¹, Giovanni Del Guado¹
¹Technische Universität Ilmenau, Fraunhofer Institute of Integrated Circuits, Huawei Technologies Düsseldorf GmbH

EuRAD12-2
Synchronization of Radar Sensors in a Network Based on Inter-Sensor Interference
Maximilian Stein¹, Manuel Keller¹, Johanna Gebel¹, Martin Vossiek², Christian Waldschmidt²
¹ Ulm University, Friedrich-Alexander University Erlangen-Nürnberg (FAU)

EuRAD12-3
CDMA-based MIMO FMCW Radar System Performance using Intra-Pulse Phase Modulation
Marie Mbeutcha¹, Viktor Krozer¹
¹Goethe University Frankfurt am Main

EuRAD12-4
A Fast Algorithm for Target Adaptive Waveform Design for Imaging with Experimental Validation
Marcel Warnke¹
¹Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR

EuRAD12-5
Instantaneous Target Velocity Estimation Using a Network of a Radar and Repeater Elements
Benedikt Meinecke¹, Maximilian Stein¹, Johannes Schlütermaier¹, Christian Waldschmidt¹
¹ Ulm University
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Chair(s)</th>
<th>Co-Chair(s)</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:10 - 11:30</td>
<td>EuRAD14</td>
<td>Focus Session Modern Advances in Imaging at Microwave, Millimeterwave and Terahertz Frequencies</td>
<td>Thomas Fromenteze¹</td>
<td>Okan Yurduseven²</td>
<td>XLM Research Institute - UMR CNRS 7252, Queen's University Belfast, EQT</td>
</tr>
<tr>
<td>11:10 - 11:30</td>
<td>EuRAD13-1</td>
<td>Automotive Radar Doppler Division MIMO With Velocity Ambiguity Resolving Capabilities</td>
<td>Feike Jansen¹</td>
<td></td>
<td>NXP Semiconductors</td>
</tr>
<tr>
<td>11:30 - 11:50</td>
<td>EuRAD14-1</td>
<td>MMW Imaging using Polarmetric Measurements</td>
<td>Claire Mignacu¹, Laurent Brochier¹, Jerôme Lanten¹, Paul Lauter¹, Julien Marn¹, Bruno Cosson¹</td>
<td>Université Côte d'Azur, Institut Fresnel, DOWEN-ERTE</td>
<td></td>
</tr>
<tr>
<td>11:10 - 11:30</td>
<td>EuRAD13-2</td>
<td>Design of a Sparse MIMO array for Automotive Radar Front-end</td>
<td>Maria Antonia Gonzalez-Huici¹</td>
<td></td>
<td>Fraunhofer FHR</td>
</tr>
<tr>
<td>11:30 - 11:50</td>
<td>EuRAD14-2</td>
<td>Millimeter-Wave and THz Polarimetric Imaging</td>
<td>Chi-Hou Chen¹, Shao-Xin Huang¹, Yuan Song, Zeng¹, Gang-Bo Wu¹, Ka-Fai Chan¹, Bao-Jie Chen¹, Ming-Yao Xie¹, Shi-Wei Qu¹</td>
<td>City University of Hong Kong, Peking University, University of Electronic Science and Technology of China</td>
<td></td>
</tr>
<tr>
<td>11:30 - 11:50</td>
<td>EuRAD13-3</td>
<td>Comparison of 2D and 3D Compressed Sensing for High-Resolution TDM-MIMO Radars</td>
<td>Fabian Rocci¹, Philipp Hüger¹, Christina Knoll¹, Lizette Loraine Tovar Torres¹, Nils Appenzell¹, Jürgen Dickmann¹, Christian Waldschmidt¹</td>
<td>Ulm University, Daimler AG</td>
<td></td>
</tr>
<tr>
<td>11:50 - 12:10</td>
<td>EuRAD14-3</td>
<td>40-GHz Active Interferometric Imaging with Noise Transmitters</td>
<td>Stavros Vakaliás¹, Liang Song¹, John Papapolymeros¹, Jeffrey Namzer¹</td>
<td>Michigan State University</td>
<td></td>
</tr>
<tr>
<td>11:50 - 12:10</td>
<td>EuRAD13-4</td>
<td>Radar-based Environment Perception using Back Projection Algorithm</td>
<td>Patrick Zaussner¹, Alexander Karnam¹, Patrick Heid¹, Dagmar Stiehleiner¹, Thomas Brünneker¹</td>
<td>Technische Hochschule Ingolstadt</td>
<td></td>
</tr>
<tr>
<td>12:10 - 12:30</td>
<td>EuRAD14-4</td>
<td>C-band Microwave Photonic MIMO Imaging System</td>
<td>Fabien Belfond¹, Hamza Hallaki Elsani¹, Yann Marie-Joseph¹, Damien Boudoucque¹, Cyril Benoist¹, Philippe Bil Biri¹, Thomas Fornierdes¹, Christelle Audet-Berthelemy¹</td>
<td>XLM Research Institute - UMR CNRS 7252</td>
<td></td>
</tr>
<tr>
<td>12:10 - 12:30</td>
<td>EuRAD13-5</td>
<td>Adaption of Fast Factorized Back-Projection to Automotive SAR Applications</td>
<td>Madeous Fathadi¹, Reinhard Feger¹, Johannes Frei¹, Markus Gerset¹, Jürgen Hasch¹, Andreas Steiber¹</td>
<td>Johannes Kepler University Linz, Robert Bosch GmbH</td>
<td></td>
</tr>
<tr>
<td>12:10 - 12:30</td>
<td>EuRAD14-5</td>
<td>Improving Quantitative Microwave Holography Through Simultaneous Use of the Born and Rytov Approximations</td>
<td>Daniel Tajik¹, Natalia K. Nikola*, Michael Noseworthy¹</td>
<td>Middlesex University</td>
<td></td>
</tr>
</tbody>
</table>
Applications for Staring Holographic Radar
Dominic Walker, Chief Executive Officer
Aveillant Ltd, 18-21 Evolution Business Park, Milton Road, Impington, Cambridge

Aveillant has developed a staring radar technology referred to as Holographic radar. The approach taken to the platform design allows a very high degree of scalability and configurability, depending on the application. Two specific applications work on very different scales: one being the detection of small UAVs (drones) for protection of airports and other critical infrastructure; the other being tracking of aircraft over very large offshore windfarms at ranges up to 60 nm. However, both applications depend on the staring nature of the radar, and the ability this gives to characterise targets based on a high resolution Doppler signature. This presentation will outline some of the techniques used in each application, and the similarities between the approaches taken to what are superficially two very different problems.

Awards Ceremony
Eric Bergeault, EuMW2019 Awards Coordination Chair.
Philippe Eudeline, EuRAD 2019 Chair
Claire Migliaccio, EuRAD 2019 Co-Chair

EuRAD Conference Prize
EuRAD Young Engineer Prize

Closing Remarks
Philippe Eudeline, EuRAD 2019 Chair
Stéphane Méric, EuRAD 2019 TPC Co-Chair

Invitation to EuRAD 2020 in Utrecht
Mayazzurra Ruggiano, EuRAD 2020 Chair

End of Session
Welcome from the Workshops and Short Courses Chairs

This year, we are pleased to offer the EuMW 2019 delegates a wide range of workshops and short courses that cover the topics of all three conferences throughout the week.

To guarantee this wide coverage of topics, the accepted 24 workshops and five short courses were selected through a pre-established review process.

The topics covered comprise theoretical and applicative aspects of circuits and systems for RF and microwave applications (sensors, high-data-rate communications, automotive, 5G, IoT). Specific themes are really wide: mm-waves and THz applications, technologies and design techniques for power devices, filters (reconfigurability, synthesis and applications), nanoscale devices characterization, phase change material, energy efficiency, multiphysics, nonlinear circuits design, advanced circuits design, bio-electromagnetism and medical applications, PMSE, RADAR, and beamforming networks.

We are very grateful to all the organisers, presenters and authors of workshop and short course materials for sharing their knowledge with the EuMW 2019 delegates, and for their hard work and dedication before and during the conference. These events could only happen because of their willingness to serve the microwave community.

All workshops and short courses are individually endorsed by one or two of the conferences that make up EuMW. However, they are available and accessible to any scientist or engineer wishing to gain a broader perspective on microwave and RF systems and devices, or to learn about a new specialism within our broad field.

Due to the wide range of covered topics, the workshops and short courses’ programme fills the entire week. Workshops or short courses that focus on topics relevant for EuMIC mainly take place from Sunday to Tuesday. On Thursday and Friday, we present most of the workshops endorsed by EuRAD. Similarly, EuMC devoted workshops are distributed throughout the whole week.

Slides for the workshops and short courses will be provided electronically at the conference. No hard copies of the slides will be provided.

Cédric QUENDO
Workshop, Short Course, Focus Session and Special Session Chair
University of Brest, CNRS, Lab-STICC – France

Rozenn ALLANIC
Workshop, Short Course, Focus Session and Special Session Co-Chair
University of Brest, CNRS, Lab-STICC – France

Fabien NDAGIJIMANA
Workshop, Short Course, Focus Session and Special Session Co-Chair
University of Grenoble – Alpes – G2ELAB – France
Recent Advances in SiGe BiCMOS: Technologies, Modelling and Circuits for 5G, radar and imaging

Chair: Christophe Gaquiere¹, Philippe Ferrari²
¹University of Lille, ²University Grenoble-Alpes

In this workshop, the recent advances in SiGe BiCMOS technology for mm-wave applications will be illustrated by many examples of technology development, designs, from components to circuits and systems.

The SiGe BiCMOS most advanced technologies in Europe will first be presented, from STMicroelectronics, Infineon and IHP. In particular, the last advances concerning fmax/ft frequencies will be highlighted. SiGe technology will be compared to standard advanced CMOS technologies to highlight the advantages/drawbacks of each technology family.

Next, specific characterization techniques for frequencies in mm-wave range will be presented, from small- (linear) to large signal (nonlinear) conditions. Some examples of components compact modelling will be illustrated. High-frequency and low-frequency noise issues, along with ageing issues, will also be addressed.

Then, circuit and system level presentations will highlight design techniques in SiGe BiCMOS technologies. Circuits and systems addressing many different frequencies will be presented, for 5G applications (28 GHz and 60 GHz), back-hauling and automotive radars in E-band, and future applications like imaging above 100 GHz, with several designs at 120-140 GHz and 300 GHz, respectively.

In particular, beam-forming applications, which is a hot topic today for future point to point communications systems, will be developed.

As for the technologies, circuit- and system-level comparison will also be carried out between SiGe BiCMOS and standard CMOS (including FDSOI), to highlight pro & cons of each technology.
RF Techniques for 5G Applications

The research area of improving the performance, cost and size of RF solutions for incoming 5G LTE is very active with many developments. Mobile cellular subscribers are expected to reach more than 6 billion by 2020 and 5G LTE will bring high data capacity as low latency using sub-6GHz and mm-Wave spectrum. The workshop presents the current status of 4G/5G LTE RF Front End and techniques to deliver an over gigabit-per-second data rate such as Carrier Aggregation and MIMO as well Wider Modulation Bandwidth for LTE and mm-Wave spectrum. The high speed wireless ecosystem which includes 5G LTE and WiFi 6 (802.11ax) will be deployed in the near future and will use two frequency domains: sub 6GHz frequency domain and mm-Wave spectrum. Mm-Wave will be used initially to increase the capacity for backhaul network and allow low latency. Also the next mobile devices will add new wireless functionality in 6GHz-8.5GHz spectrum such as Ultra-wideband (UWB) for proximity indoor location as other smart applications.

From this prospective and the concurrently deployment for 5G LTE New Radio (NR) with the actual 4G LTE will increase the complexity for RF Front End Modules (RF FEMs) and will be covered in this workshop.
WS-03 (EuMC)

Microwave Characterization and Modelling at Nano and Micro-Scale of Advanced Materials to Enhance Emerging Products Manufacturing

Chair: Kamel Haddadi¹, Johannes Hoffmann²
¹University of Lille, CNRS / IEMN, ²METAS

On one hand, Manufacturing industry offers a large range of organic and inorganic based materials addressing numerous applications. The quality and performance of the final manufactured products depend strongly on their chemical/electrical/optical/mechanical properties at nanoscale as well as their arrangements at macroscale (amorphous, partially isomorph, hybrid/composite, multi-layered). On the other hand, microwave to mm-wave nondestructive testing and evaluation methods are well established for determining electrical properties of materials. A variety of methods including far to near field free-space, guided, resonant and scanning probe microscopy offers numerous solutions for Macro down to Nano scale characterization. In this context, the objective of this workshop is oriented towards RF to mm-wave techniques and related instruments dedicated to nondestructive evaluation applicable to wide range of emerging materials. This workshop is proposed in the frame of the H2020-NMBP-07-2017 MMAMA "Microwave Microscopy for Advanced and Efficient Materials Analysis and production" (www.mmama.eu).

Programme

MMAMA project objectives: Study of electrical properties of organic semiconductors and photovoltaic nanostructures using microwave characterization methods
David Moerman¹, Olivier Douheret¹, Pascal Viville¹
¹Materia Nova

Dielectric resonator scanning of wafer - size surfaces at finer - than - head resolution
Malgorzata Celuch¹
¹QWED

Quasi free-space TEM Material Measurements
Alireza Kazemipour¹
¹METAS

Synthesis, Verification and Reproducibility of Microwave Design Materials
Christoph Baer¹
¹Ruhr University Bochum

Wideband Electrostatic Force Microscopy (EFM): Broad Frequency Range with High Sensitivity
Georg Gramse¹, Ferry Kienberger¹
¹Keysight Labs

Tips and Calibration of Nearfield Scanning Microwave Microscopes
Johannes Hoffmann¹
¹METAS

Microwave Microscopy based on GHz Surface Acoustic Waves on thin Film Materials
Luca Pierantoni¹, Davide Mencarelli¹, Andrea Di Donato¹, Marco Farina¹
¹Universita Politecnica delle Marche

FEM Solver for Drift-Diffusion Semiconductor Equations coupled with full Maxwell Electromagnetics
Arif Guengoer¹
¹ETHZ

Combined Atomic, Microwave and Electron Microscope: A tool for Hybrid Characterization of Nanomaterials
Petr Polobodoov¹, Didier Theron¹, Gilles Dambrine¹, Kamel Haddadi¹
¹University of Lille, CNRS / IEMN, ²CNRS / IEMN

Integrated Fluorescence and Scanning Microwave Microscopy: Nano-Imaging with GHz on System With "Proof of Life"
Zahra Nemati¹, Jinfeng Li¹, Peter Burke¹
¹UC Irvine

Time: 08:30 – 17:50    Room: 731+732
Various RF front-end technologies based on GaN, Si-CMOS etc. for 5G new radios (NRs) base stations have been discussed in major conferences up to now. Now, the 3GPP has announced that 5G standards have been completed for services. This workshop introduces not fantastic but “real” 5G devices and systems accordingly while focusing on sub-6 GHz power amplifiers and 28 GHz transmitters. In addition, the workshop covers recent progress in RF devices, circuits, assembly, and phased array systems not only for 5G base stations but also for 5G handsets. These above hottest 5G NR topics will be provided by real 5G base-station manufacturers and real device suppliers.

The workshop attendees, therefore, will be able to learn and understand a variety of technical issues, their countermeasures, and the latest results related to base station transmitters and handset amplifiers of 5G NRs at a time. Thus, it is expected that this workshop will be very useful for 5G amplifier designers; beginners or less-experienced circuit/device designers as well as experienced designers engaged in circuit- and device-suppliers for use in 5G NRs.

Programme
Overview of 5G and expectations for RF front-end
Hiroshi Okazaki¹
¹NTT DOCOMO, INC

GaN HEMT Power Amplifiers for 5G Base Stations
James Wong¹
¹Sumitomo Electric Europe Ltd.

GaN Technology Challenges with 5G Infrastructure Applications
Monte Miller¹
¹NXP Semiconductors, USA

Advances in 5G handset RF front-ends: PAs and filters
Florinel Balteanu¹
¹Skyworks Solutions Inc.

Envelope tracking power amplifiers for 4G/5G mobile handset applications
Kenji Mukai¹
¹Murata Manufacturing Co., Ltd.

100nm and sub 100nm GaN/Si MMIC processes : The perfect complement to mmW 5G applications
Marc Rocchi¹
¹OMMIC

GaN HEMT Technologies for 5G Base Station Amplifiers
Kazutaka Inoue¹
¹Sumitomo Electric Industries, Ltd.
Microwave measurements at systems, components and materials levels: a global approach to improve energy efficiency of the next generation of electronic devices

Chair: Francois Ziade¹, Djamel Allal¹
¹Laboratoire National de Metrologie et d’Essais (LNE)

New materials, more efficient components and systems that are less power consuming must be developed by the semiconductor, electronics and telecommunications industries to meet ultralow power requirements needed in wireless systems and electronic devices involved in 5G and IoT applications. This workshop aims to present a global approach, acting at different levels (system, component and material), to improve energy efficiency of the next generation of electronic. The basis of this approach is the following:

- Wireless communication systems and wireless sensors needed for 5G and IoT applications require better accuracy, reliability and traceability of the measurement of power as well as a better understanding of the mapping distribution of the power consumption.
- The efficiency of RF and microwave components depends on the operating conditions (linear or nonlinear regime, frequency of signal excitation, impedance seen at its inputs and outputs, DC bias conditions). In time-domain, oscilloscopes can be used to provide a measurement of the switching losses by integrating over the product of the synchronous and simultaneous measurements of the current and voltage waveforms.
- Material candidates for low power / high efficiency electronic components, such as the existing InP and GaN III/V semiconductor materials and also the emerging strain engineered piezoelectric materials require the determination of electrical permittivity and dielectric loss at nanoscale.

In introduction, key figures of ICT energy issues and main aspect of this approach will be presented to the auditory. Then the first part of the workshop will be dedicated to on-chip power sensors and contactless techniques based on Near Field electromagnetic techniques which are complementary approaches to provide reliable power measurement data at system level.

Secondly experts will provide main aspects of VNA and NVNA uncertainty evaluation, thermal, electromagnetic, and electrical performance of a gallium nitride (GaN) power transistor for different load conditions and finally an overview of measurement method for characterizing switching waveforms by means of time-domain instrumentation.

Finally the workshop will be focused on calibration aspects and features of Scanning of Microwave Microscopy (SMM) which is a novel and highly versatile scanning probe technique used to investigate materials and devices at the nanoscale.
WS-06 (EuMC)
Future Wireless Technologies in the Terahertz and Optical Frequency Bands

Chair: Dominic O’Brien¹, Olivier Bouchet²
¹University of Oxford, ²Orange

The session comprises four presentations focusing on the challenges and possible solutions in the design of THz and Optical wireless components, systems and networks for beyond 5G access technologies. The presentations will be followed by a panel session for open questions. The key aim is to discuss and provide the audience a vision of the system and network designs, which will enable joint use of the RF and optical spectrum.

- Nanometric band, the new wireless Eldorado.
  Olivier Bouchet¹
  ¹Orange

- Facing the Challenges in Aggregation of Terabit Wireless Links
  Marcin Brzozowski¹
  ¹IHP

- Photonically enabled THz wireless communication
  Cyril Renaud¹
  ¹University College London

- Next generation terabit wireless communications in the 200 GHz band
  Vladica Sark¹
  ¹IHP

Time: Room: 08:30 – 12:30 737+738

---

WS-07 (EuMC)
New materials and technologies for reconfigurable RF components

Chair: Hjalti H. Sigmarsson¹, Nicolas Delhote²
¹Oklahoma University, ²Univ. Limoges, Xlim, CNRS, UMR 7252

Reconfigurability is one of the most exciting paradigms that can make regular fixed frequency RF components capable to reconﬁgure their behaviour, such as the operating frequency and bandwidth for a given filter or the frequency and polarization of an antenna. Modern materials and manufacturing technologies can provide exciting new ways to bring such capabilities to components that are meant to be integrated into RF front-ends.

The purpose of this half-day workshop, that is specifically focused on practical realizations of reconfigurable filters and antennas, is to give a recent overview on new materials and technologies providing such reconﬁgurability. The workshop will highlight for example materials like phase change/transition materials operating at the millimeter-wave and liquid metals. Such materials, thanks to their superior properties can bring new means of reconﬁgurability by providing very integrated switching capability and high-power handling respectively. Partially magnetized ferrite substrates based on LTCC technology as well as RF switches based on memristor technology will also be overviewed in this workshop as innovative reconfigurable methods. A last part of this workshop will cover varied methods to turn fixed frequency planar, SIW and SIW-like filters into tunable ones by different means. PCB based and self-packaged 3D printed ceramic filters will be covered.

- Exploration of easily manufacturable memristor technology for RF switch applications
  William Chappell¹, Qiangfei Xia²
  ¹DARPA, ²University of Massachusetts

- Continuously Reconfigurable Filters using Liquid-Metal Actuation
  Hjalti H. Sigmarsson¹
  ¹Oklahoma University

- Reconfigurable antennas based on functional materials
  Aurelian Crunteanu¹, Laure Hultema¹
  ¹Univ. Limoges, Xlim, CNRS, UMR 7252

- Tunable and Reconfigurable Passive Microwave Component Designs Based on Partially Magnetized Ferrite Substrates
  Farhan Abdul Ghaffar¹, Langis Roy¹
  ¹University of Ontario Institute of Technology

- Planar and SIW tunable devices
  Cédric Quendo¹, Benjamin Potelon¹, Jean François Favennec¹, Eric Rius¹, Rozenn Allanic¹, Denis Le Berre¹
  ¹Univ. Brest, Lab-STIC, CNRS, UMR 6285

- Compact surface mountable and tunable 3D ceramic filters
  Aurelien Pergaud¹, Nicolas Delhote¹, Remi Segalen¹, Yves Marcuso²
  ¹Univ. Limoges, Xlim, CNRS, UMR 7252, ²Thales DMS France, ³Thales DMS

Time: Room: 13:50 – 17:50 737+738
WORKSHOPS AND SHORT COURSES - SUNDAY

Time: 08:30 – 17:50
Room: 723+724

WS-08 (EuMC/EuMIC)
RF Technologies & Techniques for Multi-Band Power Amplifiers for Radars and Communications

Chair: Gabriele Formicone¹, Guillaume Callet²
¹Integra Technologies, Inc., ²Unnited Monolithic Semiconductors

Latest or emerging trends in radar and communications take advantage of operation over multiple frequency bands to achieve system capabilities unobtainable through operation over a standard frequency band. One example of such trend is clearly manifested in wireless communications with carrier aggregation, which enables a single device to operate over multiple bands. Wireless communications over multiple bands also enable higher data rates, and these low power systems can take advantage of the latest developments in tunable and reconfigurable components. Also, dual-band transponders and transceivers for satcom or telemetry, tracking and command (TT&C) utilize multi-band RF techniques. Similarly, although operating at much higher power levels compared to multi-band communication systems, radars operating over multiple bands have the capability of providing greater functionality. For example, radars operating at C and X band (such as KRONOS, from Leonardo), or S and C band, or X and Ka band (such as GEMINI-DB, from GEM Elettronica) can provide an unprecedented level of performance and capability to detect and track hostile targets or higher resolution and more information in remote sensing applications. Multi-band system architecture may rely on different power amplifiers for different bands, or whenever feasible, a single power amplifier for multiple bands.

This workshop focuses on RF technologies and techniques available for power amplifiers (PA) operating over multiple bands, covered either by a single PA module or multiple PAs for each frequency band. Being a relatively new field, power amplifier design techniques for “multi-band single PAs” are still evolving without a fully established methodology. Although multiband communication systems operate over relatively close multiple bands, where traditional broadband / wideband power amplifier techniques can be quite successful, multiband radar frequency bands tend to be very far apart where traditional broadband / wideband techniques may not yield an acceptable performance. For instance, broadband / wideband power amplifier techniques require very expensive trade-offs in terms of efficiency, gain and power level. Therefore, it is not uncommon having multiple transmitters for multiband radars. At the same time innovative ideas suitable for multiband single PA systems are strongly desired with the potential to achieve higher RF performance metrics in terms of efficiency, gain and power level. This workshop reviews the RF and MW technologies and techniques available to the designers today, with the hope of opening a debate and stimulating new ideas and maybe identifying new directions of research and development which could lead to future multiband single high power amplifiers with superior performance than achievable today.

Programme

X-band Compact Dual-Polarimetric Doppler Radar using GaN Power Amplifier Module
Takuo Kashita¹
¹Furuno Electric Co.

High-power solid-state amplifier modules for Multi-Band coherent radar systems
Giorgio Pizziol¹
¹GEM Elettronica

Microwave developments for new Airborne Antennas
Yves Mancuso¹
¹Thales DMS

Advanced AESA architectures based on new GaN Solutions
Claudio Lanzieri¹
¹Leonardo Company

Technologies and architectures for space-borne high-efficiency RF power amplifiers
Václav Valenta¹
¹European Space Agency (ESA)

GaN Technologies for Multi-band/Broadband Power Amplifiers
Rüdiger Quay¹
¹IAF-Fraunhofer: Fraunhofer Institute for Applied Solid-State Physics

High Power RF Pallet Solutions for Radar Systems from UHF to S-band
Gabriele Formicone¹
¹Integra Technologies, Inc.

High efficiency Wideband Power amplifier using Envelop tracking technology for high data rate communication application
Wilfried Demenitroux¹, Stéphane Dellier²
¹Thales Group, ²Wupatec

Multi-band High-Efficiency Power Amplifiers for Concurrent Signal Transmission
Zoya Popovic¹
¹University of Colorado, Boulder, Colorado
WORKSHOPS AND SHORT COURSES - SUNDAY

WS-09 (EuMC)

THz Applications: Present and Future

Chair: Israel Arnedo¹, Albert Redo-Sanchez²
¹UPNA, ²das-Nano S.L.

The terahertz frequency range can be defined as the band of the electromagnetic spectrum centered at 1THz. Thus, the rule of factor 10 expands the frequency range from 0.1 THz to 10 THz. The so-called THz range lies in the gap between the microwave and the infrared bands. The combination of the technologies used in these two frequency ranges has been applied during the last decade to develop successful application oriented THz systems. This workshop covers two fundamental aspects of the THz field. On one hand, the differences between THz generators/receivers consist of radiation sources, detectors, passive/active components, and transmission technologies will characterize their pros and cons. Indeed, the availability of commercial THz generators/receivers (with all the components needed to perform its correct operation) is quite modern. Hence, in the first part of the workshop our top-recognized speakers will present an overview of the commercial THz generators/receivers along with its fundamental physical insight. On the other hand, due to the fact that the THz band is the last region of the electromagnetic spectrum technologically conquered (from RF to optics should be understood) many unsolved industrial problems have tried to be figured out with THz waves. Thus, in the second part of the workshop multitude of thriving applications in many fields will be presented: communication, biology, medicine, astrophysics, security, material detection, non-destructive evaluation, ... The historical perspective, the current state-of-the-art and the future perspective of both THz generators/receivers and THz applications are cover in this workshop being a great opportunity for beginners in the field but also for expert who wants to expand their scope of knowledge in a really broad sense.

<table>
<thead>
<tr>
<th>Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to THz and their Applications</td>
</tr>
<tr>
<td>Israel Arnedo¹, David Etayo²</td>
</tr>
<tr>
<td>¹UPNA, ²das-Nano S.L.</td>
</tr>
<tr>
<td>Fundamentals of THz Generation</td>
</tr>
<tr>
<td>Björn Globisch¹</td>
</tr>
<tr>
<td>¹Fraunhofer Heinrich Hertz Institute</td>
</tr>
<tr>
<td>Fundamentals of THz Generation</td>
</tr>
<tr>
<td>Javier Tejada¹, Alvaro Cordon²</td>
</tr>
<tr>
<td>¹Universidad de Barcelona, ²das-Nano S.L.</td>
</tr>
<tr>
<td>Available Current Instrumentation for THz</td>
</tr>
<tr>
<td>Joachim Jonushiet¹</td>
</tr>
<tr>
<td>¹Fraunhofer Institute for Industrial Mathematics ITWM</td>
</tr>
<tr>
<td>Future trends in THz Instrumentation</td>
</tr>
<tr>
<td>Christoph Gleichweit¹</td>
</tr>
<tr>
<td>¹Menlo Systems GmbH</td>
</tr>
<tr>
<td>THz Applications in Pharmaceutics and Medicine</td>
</tr>
<tr>
<td>Phil Taday¹</td>
</tr>
<tr>
<td>¹Teraview</td>
</tr>
<tr>
<td>THz Applications in Automotive and Wind-power industry</td>
</tr>
<tr>
<td>Montserrat Fernandez¹, Albert Redo-Sanchez²</td>
</tr>
<tr>
<td>¹das-Nano S.L.</td>
</tr>
<tr>
<td>THz Rays for the Graphene Industry</td>
</tr>
<tr>
<td>Peter Uhd Jepsen¹</td>
</tr>
<tr>
<td>¹Technical University of Denmark</td>
</tr>
<tr>
<td>THz Rays for Art and Object Conservation</td>
</tr>
<tr>
<td>Enrique Castro-Camias¹</td>
</tr>
<tr>
<td>¹Centro de Investigaciones en Optica A.C. Mexico.</td>
</tr>
<tr>
<td>Future THz Applications</td>
</tr>
<tr>
<td>Jan Balzer¹</td>
</tr>
<tr>
<td>¹Faculty of Engineering, University Duisburg-Essen</td>
</tr>
</tbody>
</table>
Semiconductor Power Amplifiers are key components in radio frequency and microwave transmitter systems. They have received a great deal of attention and development effort over the last decades and are still a hot topic in research area. This short course aims to provide a comprehensive overview of all aspects of fundamental semiconductor microwave power amplifier design. It is an introductory course, aimed at graduate engineers who have moved into the field of RF design, as well as to microwave designers who aim to deeply understand the power amplifier basic concepts.

This short course features a range of presentations and will provide a comprehensive overview and basic understanding on recent important progress and novel state-of-the-art achievements in semiconductor power amplifiers. Very recent advances in semiconductor amplifiers and their applications will also be covered.

Starting from the fundamental concepts on semiconductor devices, the core of a power amplifier design, the theoretical foundations of a power amplifier design are discussed. It will include fundamental concepts and state-of-the-art results on actual designs of a range of semiconductor power amplifiers using existing foundries. The load pull technique is also addressed and focused on the designer perspective.

The presentations will also cover a variety of advanced topics, and will provide the attendees with a clear overview of the main streams of current and important research trends worldwide in this field, as the Doherty architecture and the more recent load modulation power amplifier design concepts.

The short course will also focus on the major challenges, such as stability (small and large signal) and how to address these in amplifier design. Finally, accounting for the linearity issue, a basic overview on linearization techniques and their adoption to properly mitigate the amplifier distortion effects will conclude the short course.

Programme

<table>
<thead>
<tr>
<th>Topic</th>
<th>Speaker(s)</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semiconductor devices for PAs</td>
<td>Ilito Angelov¹</td>
<td>Chalmers Univ</td>
</tr>
<tr>
<td>Semiconductor devices for PAs</td>
<td>Paolo Colantonio¹</td>
<td>University of Roma Tor Vergata</td>
</tr>
<tr>
<td>Semiconductor devices for PAs</td>
<td>Franco Giannini¹</td>
<td>University of Roma Tor Vergata</td>
</tr>
<tr>
<td>PA theoretical foundation</td>
<td>Franco Giannini¹</td>
<td>University of Roma Tor Vergata</td>
</tr>
<tr>
<td>The Doherty Power Amplifier</td>
<td>Paolo Colantonio¹</td>
<td>University of Roma Tor Vergata</td>
</tr>
<tr>
<td>Load Modulated PAs</td>
<td>Steve Cripps¹</td>
<td>Cardiff University</td>
</tr>
<tr>
<td>Design of a C-band Single-stage Hybrid 100W GaN PA</td>
<td>Francesco Scappaviva¹, Davide Resca¹</td>
<td>MEC srl</td>
</tr>
<tr>
<td>Design and model oriented Load Pull techniques</td>
<td>Marco Pirola¹</td>
<td>Politecnico di Torino</td>
</tr>
<tr>
<td>Trading off high efficiency and linearity in PA and transmitter design</td>
<td>Zoya Popovic¹</td>
<td>University of Colorado</td>
</tr>
<tr>
<td>X-parameters for high-power PAs modeling and System Level Analysis</td>
<td>Alessandro Cidronal¹</td>
<td>University of Florence</td>
</tr>
<tr>
<td>Linear and Nonlinear Stability Analysis of Power Amplifiers</td>
<td>Giorgio Leuzzi¹</td>
<td>University of L’Aquila</td>
</tr>
<tr>
<td>Linearization techniques overview</td>
<td>Pere L. Gilabert¹, Gabriel Montoro Lopez¹</td>
<td>Universitat Politecnica de Catalunya (UPC-Barcelona Tech.)</td>
</tr>
</tbody>
</table>
THz technologies open new market opportunities for a vast range of applications. THz has the ability to be robust and commercially available for a wide range of applications from security screening to biochemical material detection. It has become the most exciting area of research and development in RF technologies with exciting promises for many future generation systems and emerging applications.

There has always been a question of "which transmission line or wave guiding technology is suitable for THz applications?" To answer this question, it is desirable to have an overview of the available wave guiding technologies over the entire range of frequencies from microwave to optics, with particular emphasis on the state-of-the-art THz transmission structure technologies.

In recent years mmWave technologies have progressed on many fronts, including semiconductor devices. A wide variety of packaged and unpackaged active electronic devices are available in the mmWave range of frequencies. Obviously, the material selection is essential for designing almost any integrated mmWave system. Among the available compound semiconductor devices, silicon-based devices are dominantly utilized in a wide range of applications from digital to high frequency circuits. Different active elements can be realized on the doped silicon substrate. However, due to the substrate losses in most of the conventional planar on-chip technologies, such as CMOS, SiGe, etc., the realization of high performance passive components and TLs is quite challenging. The on-chip antennas are quite inefficient in the mmWave/THz range of frequencies. Therefore, developing a low-cost technology for passive off-chip transmission structures and devices is inevitable. Dielectric waveguides are highly promising transmission structures for realization of almost any off-chip systems at the mmWave and THz range of frequencies. Generally, dielectric waveguides offer the combined advantages of low-loss, light weight, and ease of fabrication. Also, dielectric waveguide-based devices provide a unique possibility for integration with planar circuits. Among possible candidates, High Resistivity Silicon (HRS) is the most promising material because of its high potential for integration, low-loss characteristics, and mature fabrication technology.

The workshop will discuss current available technologies used in the millimeter wave and terahertz range of frequencies. Then the focus will be on dielectric waveguide based technologies. Afterward, we will talk about different Silicon-based technologies developed in CIARS (Centre for Intelligent Antenna and Radio Systems). Three major technologies, SIG, SOQ, and SOG, will be discussed in detail. The introduced silicon-based technologies provide a high-performance platform for operating at mmWave range of frequency and beyond up to about 1000 GHz.

**Programme**

**Dielectric Waveguide Technology: New Era for communications**
Safeddin Safavi-Naeini¹, Mohamed Basha¹
¹University of Waterloo

**Dielectric Waveguide Design Procedure in Different Platforms**
Aidin Taeb¹
¹University of Waterloo

**Implementation and fabrication techniques of different silicon waveguide based technologies**
Mohamed Basha¹
¹University of Waterloo

**Simulation results, experimental verifications, and concluding remarks**
Aidin Taeb¹
¹University of Waterloo
WORKSHOPS AND SHORT COURSES - MONDAY

Time: 08:30 – 12:30 Room: E03

WM-01 (EuMC/EuMIC)
Advanced CAD Tools and Techniques for the System Co-Design of Smart Antenna and Transmitter Modules

Chair: Sebastien Mons¹, Tony Gasseling²
¹Limoges University (Xlim Lab), ²Amcad Engineering

Such revolution requires more flexibility and interaction between the CAD tools used for the definition and the optimization of the full architecture at system level (radiating panel & transmitter modules) and its constitutive blocks at Technological level. It appears that accurate system simulations, based on advanced macro modelling techniques is a promising way to address effectively the EM/circuit paradigm by combining interesting trade-off between performances, consumption and cost for such transceivers. In this workshop, speakers from leading industries and universities will present state-of-the-art results in advanced CAD tools and characterizations techniques for the modelling of complex systems in order to achieve an efficient co-design of antenna array and transmitters that make constructive use of unwanted load modulation effects at the interface.

Programme

OTA Characterization of nonlinear transmitters using specially designed multi-sines
Nuno Borges Carvalho
¹Aveiro University

Advanced RF FrontEnd Modeling for large scale architectures such as active antennas or 5G communication systems
Tony Gasseling
¹Amcad Engineering

Modeling of large antenna array for SATCOM applications
Benoit Lesur
¹Zodiac Data Systems

Advanced CAD tools for an efficient Antenna / Module co-design
Edouard Ngyenas
¹Limoges University (Xlim Lab)

Stimulus-response characterization of radio transmitter components under wideband repetitive test signals
Jean-Pierre Teyssier
¹Keysight

Design flow challenges for 5G active array antennas
Kristoffer Andersson
¹Ericsson

Time: 13:50 – 17:50 Room: E03

WM-02 (EuMC)
Phase Change Material for Microwave Applications

Chair: Pierre Blondy¹, Petronilo Martin-Iglesias²
¹XLIM, ²European Space Agency

Phase change materials (PCM) is already seen as a disruptive technology when low electrical losses are required together with high level of integration. In addition, high isolator and broadband response are offered. Microwave switches based on PCM can be thermally transitioned between amorphous and crystalline states, showing several orders of magnitude change in resistivity. Phase change switches are fast, small form factor, and can be readily integrated with MEMS and CMOS electronics. Several research groups around the world are working in bringing the maturity level suitable for a product development and, in some of the cases, the use of the technology for space applications. The workshop would like to trigger the discussion regarding performance, challenges and limitations.

Programme

Phase Change Switch development for an “RF FPGA”
William Chappell
¹DARPA

Double-Port Double-Throw (DPDT) Switch Matrix Based on Phase Change Material
Pierre Blondy¹, Ines Betoumi¹, Aurelian Crunteanu²
¹XLIM, ²Univ. Limoges, Xlim, CNRS, UMR 7252

Germanium Telluride Phase-Change RF switches: some design rules
Florence Podevin¹, Alexandre Leon², Bruno Reig², Etienne Perret², Philippe Ferrant²
¹Univ. Grenoble Alpes, ²IST Microelectronics, ²CEA Leti, ²Grenoble INP, ²University Grenoble-Alpes

PCM-Based and MIT-Based RF Switches
Raafat Mansour¹
¹University of Waterloo

5 THz Figure-of-Merit Phase change RF switches with 100 million Cycle Reliability
Jeong-sun Moon¹, Hwa-change Seo¹, Kyung-ah Son¹, Kangmu Lee¹, Daniel Zehnder¹, Haw Tai¹, Dustin Le¹
¹HRL Laboratories

Phase change electro-optical components
Mina Rais-Zadeh²
¹NASA JPL and U. of Michigan

www.eumweek.com | 81
WORKSHOPS AND SHORT COURSES - MONDAY

Time: 08:30 – 17:50  Room: E04

WM-03 (EuMC)
Current and Future Use of Spectrum by PMSE

Chair: Alan March¹, Alain Richer¹
¹Sennheiser

This workshop is the 5th workshop in a series of workshops related to PMSE (Program Making and Special Events) at EUMW. PMSE, say professional wireless microphones, wireless in ear monitors, wireless cameras and wireless effect control are, in particular, fundamental elements of our daily cultural life and essential tools for content production. They are employed in journalistic news coverage, sports events, theatres, by educational and cultural institutions, trade fairs, film productions, conference-centres, churches, sports clubs, etc. This workshop addresses recent changes in UHF spectrum from the viewpoint of spectrum access for PMSE. Updates on current and foreseeable changes in radio technology, standardisation and spectrum regulation will be discussed regarding their impact on PMSE radio design and usage. Recent research outcomes on cognitive radio approaches for PMSE and integration of PMSE into 5G cellular communication are presented.

Welcome and brief introduction in the 5th PMSE WS
Alan March¹
¹Sennheiser

Short introduction in PMSE
Alain Richer¹
¹Sennheiser

A methodology for the practical recording of PMSE frequency use and a quick summary of more than 10 years of spectrum observation in the event production
Matthias Fehr¹
¹APWPT

Is PMSE wasting spectrum? A fair view on providing high QoS and high QoE
Georg Fischer¹
¹FAU University Erlangen-Nuremberg

The EBU work on feasibility and application of 5G in content production
Darko Ratkaj¹
¹EBU

Foreseeable benefits and limitations of 5G Technology for PMSE
Andreas Wilzeck¹, Maria Perez-Guario¹
¹Sennheiser

Standardisation and Regulation activities reg. PMSE in CEPT, ETSI and ITU-R
Wolfgang Bilz¹
¹SHURE
Integration and multi-physics challenges in 5G mm-wave system design

Chair: Christian Fager¹, Kristoffer Andersson²
¹Chalmers University of Technology, ²Ericsson

Millimeter-wave frequency bands and multi-antenna MIMO technologies are now widely explored to address the demand for increased capacity and reliability in emerging mobile communication systems, 5G and beyond. Initial testbed results have demonstrated the potential but also highlighted the practical challenges of such technologies. The combination of high frequency, small size, large signal bandwidth, and increased functionality is raising fundamental integration and multi-physics challenges that have to be addressed before the initial results can be translated into products.

The objective of this workshop is to give a comprehensive overview of some of the most important research challenges in the design and analysis of highly integrated hardware for millimeter wave multi-antenna systems. Heat dissipation and related thermal effects has emerged as one of the most important and limiting factors in realization of millimeter wave 5G hardware. A major theme for this workshop will therefore be multi-physical problems that arise when thermal-, mechanical-, circuit-, and antenna-design considerations have to be jointly satisfied. The workshop presentations will illustrate how recent advances in analysis, simulation, and integration can help researchers in academia and industry to better understand how to optimize their designs under the constraints in future system applications.

The workshop brings together views by leading industry, institute, and academic researchers. This will give the audience both perspectives of detailed technical solutions, as well as, an overview on the requirements that drive industrial system development.

**Programme**

**Workshop introduction**
Christian Fager¹, Kristoffer Andersson²
¹Chalmers University of Technology, ²Ericsson

**Introduction to Electronics Cooling**
Peter Melin¹
¹Ericsson, Sweden

**Silicon-Based RF Devices and Hybrid Frontend Integration for Massive-MIMO Systems**
Franz Dielacher¹
¹Infineon Technologies

**Thermal-Aware Multi-Beam Antenna Synthesis in 5G**
Yanki Aslan¹
¹Delft University of Technology

**Application of High-Fidelity Simulation for 5G Antenna Systems**
Alain Michel¹
¹Ansys

**Advanced Packaging & RF System Integration for 5G mmWave Systems**
Ivan Ndip¹
¹Fraunhofer IZM

**Thermal Modeling Methodology of RF Power Devices to Improve System Level Simulations**
Raphael Sommet¹
¹Xlim / University of Limoges

**Predicting Electro-Thermal Effects in Active Circuits for 5G**
Eric Leduc⁷, Victor Pousson⁷
⁷UMS, ⁷Keysight Technologies

**Thermal coupling in integrated GaN circuits**
Mattias Thorsell¹
¹Chalmers University of Technology
WM-05 (EuMC)  
Terahertz Devices, Circuits and Systems: from fundamentals to applications

Chair: Dimitris Pavlidis¹, Imran Mehdi², Javier Mateos³
¹Boston University, ²Jet Propulsion Laboratory, ³University of Salamanca

THz technology has reached a certain degree of maturity but there are still important developments necessary for implementing it to systems. At the same time, there are still needs for device and circuit studies in order to improve, frequency, power, sensitivity performance and provide integrated solutions to system requirements. The workshop will provide the opportunity to new generations of scientists and engineers to learn about the unique features of Terahertz technologies, while at the same time addressing the latest achievements in the field. THz applications to be discussed extending among from sensing and spectroscopy to communications and imaging. The workshop will bring together experts from various academic, national labs and commercial enterprises to discuss the most recent advances in their respective fields and to provide insight into what the future might hold for exploration of this frequency range. It will focus on a variety of materials such as traditional III-Vs, III-Nitrides, Silicon, Graphene and Transition metal dichalcogenides (TMDs), as well as various device concepts for efficient THz generation and detection. The operation of the components to be discussed is based on plasmonics, photoconductors, plasma waves, photomixing, Resonant Tunneling, Negative Differential Resistance, CMOS and High-Electron Mobility Transistors. Devices such as Quantum Cascade Lasers, Self-switching Diodes and Uni-Traveling-Carrier Photodiodes will also be addressed. Advanced Sensing, Imaging and Communications and terrestrial, space applications will be discussed. The Workshop is intended for young scientists and engineers who are interested in learning about this emerging field, as well as individuals with a more advanced understanding of related concepts. The topics addressed include fundamental and engineering considerations together with the latest results in Terahertz technology.

Programme

THz Applications: From Devices to Space Systems
Imran Mehdi²
²Jet Propulsion Laboratory

Nitride-based Two-and Three-Terminal Devices for THz applications
Dimitris Pavlidis¹
¹Boston University

Gated Planar Nanodiodes for THz detection
Javier Mateos³
³University of Salamanca

THz oscillators using resonant tunneling diodes and their functions for various applications
Masahiro Asada¹, Satumi Suzuki¹
¹Tokyo Institute of Technology

Low Noise Terahertz InP HEMT Technology and Applications
William Deal⁴, Kevin Leong⁴, Caitlyn Cooke⁵, Gerry Mei⁶
⁴Northrop Grumman Corporation

Recent advances in THz Antennas
Maria Alonso¹
¹Jet Propulsion Laboratory, Caltech

Planar Antennas for THz Sources: What about the Skin Effect?
Elliott Brown¹, Andrea Mingardi¹, Weidong D. Zhang², Enrique García-Munoz², Björn Globisch³
¹Wright State University, Dayton, OH, USA, ²Universidad Carlos III de Madrid, Leganes, Madrid, Spain, ³Fraunhofer Heinrich Hertz Institute

Graphene and Dirac materials beyond graphene: applications in THz metamaterials and plasmonics
Berardi Sensale-Rodriguez⁷
⁷University of Utah

High performance terahertz radiation sources based on plasmonic photoconductors
Mona Jarrahi⁸
⁸University of California, Los Angeles

THz Photomixing, laser sources & applications
Philippe Latzel¹, Fabio Pavanello¹, E. Peytavit¹, Stefano Barbieri¹, Mohamed Zakhroune¹, Jean-Francois Lampin¹
¹IEMN, Villeneuve d’Ascq, France

Chip-Scale Molecular Clock Using THz Rotational Spectroscopy
Ruonan Han⁹
⁹Massachusetts Institute of Technology

Optically-Controlled Tunable/Reconfigurable Terahertz Devices for Advanced Sensing, Imaging and Communications
Lei Liu¹, Li-Jing Chang²
¹University of Notre Dame, ²Oregon State University

Enabling Terahertz Communication Networks: From Theory to Practice
Josep Jornet¹
¹University of Buffalo, NY
Programme

**Advanced Planar and SIW-based Filtering Architectures with Reflection-less and Multi-configuration Capabilities**

Roberto Gómez-García¹, Dimitra Psychogiou², Cédric Quendo³
¹University of Alcalá, ²University of Colorado Boulder, ³Univ Brest, Lab-STICC, CNRS, UMR 6285

**Recent Advances on Technological Aspects of Compact or Tunable SIW Filters**

Benjamin Potelon¹, Cédric Quendo², Jean François Favennec¹, Eric Rius¹
¹Univ Brest, Lab-STICC, CNRS, UMR 6285

**Compact and Tunable Coaxial SIW Resonator Filters**

Stefano Sirri¹, Jorge Daniel Martinez¹, Miguel Angel Sanchez-Soriano², Vicente E. Boria¹
¹Technical University of Valencia, ²University of Alicante

**Compact and Novel Filters in Substrate Integrated Waveguide (SIW) Technology**

Cristiano Tomassoni¹, Maurizio Bozzi², Luca Perregrini²
¹University of Perugia, ²University of Pavia

**Recent Advances in Planar Filter Technology**

Jiasheng Hong¹
¹Heriot-Watt University

**High-Q Multi-Band Filters**

Raafat Mansour¹
¹University of Waterloo

**Microwave Cavity Filter Design Methodology for Additive Manufacturing**

Dacouda-Lamine Diedhiou¹
¹ELLIPTIKA

**AFSIW Technology for Space Application Filters**

Anthony Ghidoti¹, Tifenn Marlin¹, Tan-Phu Vuong², Frédéric Lotz³
¹University of Bordeaux INP, ²Grenoble Alpes University INP, ³Cobham Microwave

**Novel ESIW and ESICL Technologies for Integrated Filters**

Angel Belenguer¹, Hector Estevez², Alejandro Lucas-Boja³, Vicente E. Boria²
¹University of Castilla La Mancha, ²Technical University of Valencia

Future communication services (with higher requirements in terms of accessibility and quality of service) and modern applications (such as the promising Internet of Things -IoT-) will be supported by enhanced wireless systems (based upon the upcoming 5G technology) and the revolutionary Internet of Satellites -IoS- (to be supported by constellations of thousands of small satellite platforms). Microwave and mm-wave filters are key building blocks in the high-frequency front-end of all these communication systems, which will impose hardest needs in terms of size (topologies), cost (scalability issues), reliability and reconfiguration performance, just to cite a few of them.

In order to cope with all these new requirements and paradigms, presently available and future technologies (including practical realizations) of high-frequency filters (as well as of related components such as diplexers and multiplexers) must be revisited and properly updated. These filters, having reliable and scalable topologies with and without tunable properties, must be capable of controlling different frequency bands with several kind of responses and fractional bandwidths to meet different system needs. There have been significant recent advances in the synthesis and physical realization of such microwave filter networks, as well as on their design and practical application within next-generation communication systems.

This workshop will be focused on the most recent advances in several technologies and practical realizations of microwave and mm-wave filters. It will cover a wide range of different topologies, design techniques, technologies and applications of high-frequency filters for wireless, microwave, communications and radar systems. First, the state-of-the-art of planar technology, considering examples of compact ultra wide-stop band planar filters, filtering components with single and multi-band responses, planar lossy filters, planar tunable/reconfigurable filters and planar self-packaged multilayer filters, will be outlined.

Then, the hybrid technology based on Substrate Integrated Waveguides (SIW) will be considered for the practical implementation of compact filter solutions with reduced losses (i.e. using 3D integrated resonators with a higher Q-factor). SIW-based filtering architectures, including reflection-less and reconfiguration capabilities, as well as more compact solutions based on the novel SIW coaxial resonator technology, will be also shown. In order to implement integrated filters with even further reduced losses, alternative realizations of the SIW technology based on removing the lossy dielectric substrate of the filter body, such as the empty SIW versions (ESIW and ESICL) and the air-filled SIW solution, will be introduced and properly discussed.

Finally, solutions for multi-band filters implemented with several 3D-waveguide technologies (e.g. based on coaxial, dielectric and waveguide resonators) will be also presented, as well as advanced and low-cost additive manufacturing techniques of waveguide cavity filters.
Programme

Electroceuticals technologies and modelling: fundamental requirements to effectively manage future therapies

Luciano Tarricone¹, Caterina Merla²
¹Department of Innovation, University of Salento, ²ENEA, Division of Health Protection Technologies

Progress in dielectric spectroscopy for biological cell characterization and cell sorting at MHz frequencies

Auricular vagus nerve stimulation - an electromagnetically-mediated medical treatment: from model to experiment

Eugenijus Kaniusas¹, Stefania Kampusch¹, Jozsef Constantin Széles²
¹Institute of Electro dynamics, Microwave and Circuit Engineering, Vienna University of Technology, and Department of Surgery, Medical University of Vienna, ²Department of Surgery, Medical University Vienna

Wireless Microenergy Platform: Pushing implantable remote stimulation to the µL (micro Liter) level

Simon Hemour¹
¹Bordeaux University, IMS Laboratory

Auricular vagus nerve stimulation - an electromagnetically-mediated medical treatment: from model to experiment

Eugenijus Kaniusas¹, Stefania Kampusch¹, Jozsef Constantin Széles²
¹Institute of Electro dynamics, Microwave and Circuit Engineering, Vienna University of Technology, and Department of Surgery, Medical University of Vienna, ²Department of Surgery, Medical University Vienna

Integrated Microwave Imaging Radar Systems With Planar Antennas for Early-Stage Breast Cancer Detection

Matteo Bassi¹
¹Infineon Technologies Austria

Medical Diagnostics by Microwave Interferometry

Alexander Koeplin¹
¹Brandenburg University of Technology

Integrated Microwave and Millimeterwave Dielectric Sensors and Actuators for Biomedical Applications in SiGe BiCMOS Technology

Jan Wessel¹
¹HP

A Wearable Noninvasive Measurement System for Water Content Detection in Biological Materials

Marco Ditzi¹
¹Friedrich-Alexander Universitat Erlangen-Nurnberg

Inductive Communication Link for Wearable and Implantable Devices

Thomas Ussmuller¹
¹University of Innsbruck

Highly-integrated Biocompatible Encapsulated Ultra-Low-Power Compact Autarky System with a 60GHz Communication Link for Implantable Glucose Monitoring

Vadim Issakov¹
¹Infineon Technologies AG
New challenges and new trends mixing active and passive devices in silicon technology: from components to tunable RF functions

Chair: Denis Le Berre¹, Gaetan Prigent²
¹Univ Brest, Lab-STICC, CNRS, UMR 6285, ²LAAS-CNRS

In recent years, electromagnetic waves are strongly prevalent due to emergence of new applications in field of wireless technology. Microwave has found an ever increasing interest for commercial as well as military applications covering areas from high speed wireless communication, personal area networking, point to point or point to multipoint data links, automotive collision-avoidance radar systems, millimetre-wave imaging and space science to defense security due to wider availability of wireless carrier bandwidths. Consequently, this constant evolution of the telecommunication, radar and sensor domains induces needs for drastic advances in term of design and technology in the microwave domain. This half-day workshop will focuses on new challenges and new trends in silicon dealing with design and technology. It aims to propose several presentations covering all Technology Readiness Level. The different talks will be organized from high Technology Readiness Level to low Technology Readiness Level ie from industrial developments and applications to very prospective academic research. In that way, it will be an overview of the challenges for today and tomorrow and trends for after-tomorrow needs. Indeed, the first talk will be given by Globalfoundries to show the technological and design challenges notably for the 5G-telecommunication systems and the impact of silicon as an emerging technology. Then, the second talk, given by IHP Microelectronics, will focus on technology developments to address very high frequencies and Terahertz applications. The third one, presented by the GREMAN (University of Tours) will concern porous silicon technology. Once these technological aspects developed, several high frequencies designs regarding fixed and tunable devices will be proposed by the LAAS-CNRS of Toulouse mastering the design process from synthesis to technological implementation. Finally, a novel way to allow the co-design of active and passive distributed components on semiconductor technology will be proposed by the Lab-STICC, University of Brest.

 Programme

WM-09 (EuMC/EuMIC)  
New challenges and new trends mixing active and passive devices in silicon technology: from components to tunable RF functions

Chair: Denis Le Berre¹, Gaetan Prigent²
¹Univ Brest, Lab-STICC, CNRS, UMR 6285, ²LAAS-CNRS

Multi Beam Antennas (MBAs) find application in several fields including wireless and satellite communications, RADARs for electronic surveillance and remote sensing, science (e.g. radio telescopes), RF navigation systems, etc. Beam-Forming Networks (BFNs) play an essential role in any antenna system relying on a set of radiating elements to generate a beam. Depending mainly on the antenna mission (i.e. operational frequency, pattern requirements, transmitting and/or receiving functionality, number of beams to be generated, etc.) different MBA architectures may be selected: from antenna systems completely based on independent feeds illuminating a number of reflectors, to hybrid systems based on both arrays and reflectors, from phased arrays to lens antennas. The trade-off on the antenna solution largely involves the BFN interconnectivity and flexibility requirements, with a wide range of applicable BFN architectures with different complexity and performance. The objective of the course is to present design principles and state-of-the-art in MBAs and BFNs. The course presents design principles and state-of-the-art in Multi-Beam Antennas (MBAs) and Beam-Forming Networks (BFNs) covering both theoretical and practical aspects. The covered topics include:

* Overview of Multibeam Antennas and system requirements.
  - Satellite Communication Systems;
  - Wireless Communications;
  - RADARs.

Chair: Piero Angeletti¹, Giovanni Toso¹
¹European Space Agency

Multi-Beam Antennas (MBAs) and Beam-Forming Networks

Chair: Piero Angeletti¹, Giovanni Toso¹
¹European Space Agency

Multi Beam Antennas (MBAs) find application in several fields including wireless and satellite communications, RADARs for electronic surveillance and remote sensing, science (e.g. radio telescopes), RF navigation systems, etc. Beam-Forming Networks (BFNs) play an essential role in any antenna system relying on a set of radiating elements to generate a beam. Depending mainly on the antenna mission (i.e. operational frequency, pattern requirements, transmitting and/or receiving functionality, number of beams to be generated, etc.) different MBA architectures may be selected: from antenna systems completely based on independent feeds illuminating a number of reflectors, to hybrid systems based on both arrays and reflectors, from phased arrays to lens antennas. The trade-off on the antenna solution largely involves the BFN interconnectivity and flexibility requirements, with a wide range of applicable BFN architectures with different complexity and performance. The objective of the course is to present design principles and state-of-the-art in MBAs and BFNs. The course presents design principles and state-of-the-art in Multi-Beam Antennas (MBAs) and Beam-Forming Networks (BFNs) covering both theoretical and practical aspects. The covered topics include:

* Overview of Multibeam Antennas and system requirements.
  - Satellite Communication Systems;
  - Wireless Communications;
  - RADARs.
STu-01 (EuMC)
Antenna Booster Technology for IoT Applications

Chair: Jaume Anguera¹, Aurora Andújar²
¹Fractus Antennas and Universitat Ramon Llull, ²Fractus Antennas

The short-course will introduce the audience to an antenna technology based on replacing a complex and customized antenna design with an off-the-shelf and miniature component called antenna booster. Being surface-mount and chip-like in nature, the antenna booster fits seamlessly in an electronic printed circuit board the same way any other electronic component such as an amplifier, filter or switch, to name a few, does. It can be assembled with a conventional pick-and-place machine, making the manufacture and design of the new generation of IoT devices simpler, faster and more cost effective reducing time to market.

Traditionally multiband antennas are mainly designed by optimizing the antenna geometry. A completely different approach will be given in the course: the main attention will be on the matching network instead, in combination with antenna boosters. The advantage of this procedure is that no antenna customization is needed but only the proper design of a matching network is required. This way, the frequency response of an antenna system for an IoT device will be tailored by the proper design of a matching network.

Examples will be given on how an antenna booster can be tuned with a matching network to operate at multiple communications systems such as IoT devices for 4G, ISM, GNSS, WIFI, Bluetooth allocated in 0.69GHz up to 6GHz.

The audience (from PhD students to wireless/microwave engineers) will be introduced to the theory behind antenna booster technology, will be given practical examples, and will participate in a hands-on, practical application using Microwave Office circuit design software. Attendants will practice the design of single-band and multiband antenna system from scratch by tailoring the frequency response of the antenna system by designing matching networks with antenna boosters.
WORKSHOPS AND SHORT COURSES - WEDNESDAY

Time: 08:30 – 17:50       Room: 741A

WW-01 (EuMC/EuRAD)
Advanced passive radar techniques and applications

Chair: Fabiola Colone¹, Diego Cristallini², Krzysztof Kulpa³
¹University of Rome La Sapienza, ²Fraunhofer FHR, ³Warsaw University of Technology

The workshop focuses on advanced techniques and applications for passive radars. The lectures foreseen are addressed to wide public, while only general radar knowledge is needed. The proposed workshop will start from passive radar fundamentals and end with advanced techniques and applications. The workshop is conceptually structured in several macro-areas. In the first macro-area of the workshop the basics of passive coherent location (PCL) will be presented. This includes the short brief of passive radar history, passive radar fundamentals, discussion of different illuminators, and detection in passive radar systems. One macro-area will address the exploitation of multiple channels (either in frequency, spacetime, or in polarimetry) for improved target detection performance and increase the reliability of such systems from both stationary and moving platforms. The specific challenges related to moving platforms PCL will be addressed in the following macro-area, which also includes PCL-GMTI, and PCL-SAR. Imaging applications will be then also analyzed in two specific contributions on PCL-ISAR and PCL imaging using satellite illuminations. One macro-area will be entirely devoted to tracking and data fusion for PCL systems. Finally, one macro-area will be devoted to specific topics of passive radars such as short range WiFi-based applications, and forward scattering radar. For each addressed topic, a theoretical background will be presented, which sets the basis to understand the main challenges and potentials. Then, appropriate signal processing techniques will be presented and the results will be illustrated against experimental data. As a consequence, in addition to the theoretical aspects, the workshop provides the attendees with an insight into the real-world applications of passive radar. Walking through these results gives the chance to describe in more detail some technical aspects related to system design issues and signal processing techniques as well as to understand the current limitations and future perspectives of passive radar sensing.

Welcome and Introduction to the Workshop
Krzysztof Kulpa¹
¹Warsaw University of Technology

Introduction to passive radars
Christopher Baker¹
¹University of Birmingham

Multi-frequency and multi-polarimetric PCL
Fabiola Colone¹
¹University of Rome La Sapienza

PCL on moving platform
Krzysztof Kulpa¹
¹Warsaw University of Technology

Multi-channel PCL for GMTI
Diego Cristallini¹
¹Fraunhofer FHR

PCL-SAR
Damian Gromek¹
¹Warsaw University of Technology

PCL-ISAR imaging techniques
Elisa Giusti¹
¹CNIT

Passive multistatic radar techniques with navigation satellite transmissions
Mike Antoniou¹, Debora Pastina²
¹University of Birmingham, ²University of Rome La Sapienza

PCL tracking and data fusion
Martina Brotje¹
¹Fraunhofer FKIE

Passive Forward Scatter Radar
Marina Gashinova¹
¹University of Birmingham

Electronic Countermeasures (ECM) applied against Passive Radar
Daniel O Hagan¹
¹Fraunhofer FHR

Short range PCL
Pierfrancesco Lombardo¹
¹University of Rome La Sapienza

Conclusions and final remarks
Diego Cristallini¹, Fabiola Colone²
¹Fraunhofer FHR, ²University of Rome La Sapienza
### WORKSHOPS AND SHORT COURSES - WEDNESDAY

**WW-02 (EuMC/EuRAD)**

**Radar Interference and Coexistence**

**Chair:** Christoph Fischer¹, Martin Kunert²  
¹HENSOLDT Sensors GmbH, ²Robert Bosch GmbH

In this workshop the possible ways forward to reduce or even eliminate the interference risk between radio emitting devices in the tens of GHz frequency range is addressed and discussed in more details. The main focus is placed on radio location systems in the road transportation domain, where safety requirements stipulated by future automated driving features result in very demanding interference robustness needs by the underlying ASIL requirements. To date vehicular radar interference mitigation techniques are mostly limited to the radar receive path with signal data repair and healing methods. Interference suppression concepts on the transmit side are, if at all, only realized in specific products on a company level without any standardization or coordination effort. Workshop contributions from other domains as the automotive sector may lead to incubator activities into the vehicular interference and frequency regulation framework by adopting or adapting well-established concepts accordingly.

| Programme | Requirements for cooperative interference avoidance in automotive radar | Werner Soergel¹  
²Robert Bosch GmbH |
|-----------|--------------------------------------------------------------------------------|------------------|
| Benefits of coordination on the mutual interference of automotive digitally modulated radars | André Bourdoux¹  
¹IMEC |
| Impacts of FMCW vs. PMCW | Noam Arkind¹, Shlomit Hacohen¹  
¹Arbe |
| Interference of digitally modulated radars | Christina Knill¹, Christian Waldschmidt¹  
¹Ulm University |
| Estimating impacts of mutual interference of automotive radars | William Buller¹  
¹Michigan Tech Research Institute |
| Overview of automotive radar regulation and standardisation activities | Andreas John¹, Frank Ernst²  
²HELLA GmbH & Co. KGaA, ²Robert Bosch GmbH |
| Automotive radar interference needs from an OEM perspective | Hans-Ludwig Bloecher¹  
¹Daimler AG |
| Coexistence of different RF systems on a platform - RADAR point-of-view | Magdalena Letsche-Nüüeler¹, Christoph Fischer¹  
¹HENSOLDT Sensors GmbH |
| Coexistence of different RF systems on a platform - Radio communication point-of-view | Rainer Bott¹  
¹Rohde & Schwarz |
| Cognitive waveform adaption for UWB radar | Marcel Warnke¹, Christian Bräu¹  
¹Fraunhofer FHR |
| State-of-the-art interference mitigation methods and their performance | Mate Toth¹, Paul Meissner¹, Alexander Melzer¹  
¹Infineon Technologies AG |
| Discussion Panel | Christoph Fischer¹, Martin Kunert²  
¹HENSOLDT Sensors GmbH, ²Robert Bosch GmbH |
Automotive radars can dramatically increase the safety of the passengers and their environment, which is absolutely fundamental for autonomous driving. However, with the increasing demands on new radar sensors in terms of range, velocity and angle resolution as well as simultaneously covered field of view and interference robustness the conventional radar modulation schemes reach their limits. This difficulty will be further tightened in the near future due to the significantly increasing number of radar sensors in cars, which is expected to double within the next five to eight years. Furthermore, autonomous driving will additionally boost this number. Thus, new approaches, concepts and waveforms are necessary to overcome the present limitations. Many of the proposed ideas to solve the arising problems include digitally modulated waveforms due to their high flexibility and adaptability, which is necessary to be suitable in many different use cases. The workshop will show a large variety of these new approaches and modulations schemes like OFDM and PMCW radar as well as their possible use in automotive applications. Additionally, modifications of the state of the art chirp sequence waveforms and antenna array designs will be demonstrated that try to expand the current limitations. Finally, new signal processing techniques will be presented which increase the usable information of the obtained radar images. Thereby, the field of applications of the radars will be further increased.
Gained significant traction as a means of realizing real-time imaging technologies. Algorithms, and their development for multi-static radar architectures have recently space reconstruction methods, including range migration and stationary phase more advanced iterative reconstruction algorithms. Moreover, emerging Fourier research in the literature, from simple, single-shot reconstruction techniques to image processing in the extract susceptility information for imaging.

Operate in all-weather conditions make such modalities an excellent choice for security-screening to biomedical imaging, nondestructive testing and through-wall imaging. Advantages such as non-ionizing radiation and their ability to ¹Queen's University Belfast, ECIT, ²University of Limoges, Xlim

New advances in computational imaging: Polarimetric computational imaging: Formalisms, Systems, and Image reconstruction

Chair: Marlene Harter¹, Holger H. Meinel²
¹Offenburg University of Applied Sciences, ²Independent consultant

Heading towards autonomous driving (AD), today cars are fully equipped with different ADAS sensors and data fusion of these multiple sensors has to take place. As time to market becomes shorter and shorter the cost and time for intensive endurance runs has to be reduced to a minimum. We have to find ways to simulate and to test the entire ADAS system under real conditions already in an early development stage. This requires not only deep understanding of the different scenarios, but also how sensors are affected by each other and by the car environment. Thinking on radar sensors installed behind painted bumpers, the performance may degrade significantly. Who is taking care about the standardized testing and validation? Bringing up new laws does not make us feel safer in road traffic. Standardized testing and validation procedures for ADAS systems are required in order to achieve social acceptance and foster trust into this upcoming technology, providing the basis towards autonomous driving.

Programme

Autonomous Drive Sensors and Fusion Market Overview
Cedric Malacau¹
¹Yole Development
Challenges in Comprehensive Automotive Radar Testing
Steffen Heuel¹
¹Rohde & Schwarz

Automotive Radar Simulation for Testing in Challenging Environments
Marina Gashinova¹
¹University of Birmingham
Operational Time Continuous Self-Diagnostics of Automotive Radars
Alexander Yarovoy¹
¹Delft University of Technology

Programme

Modern Advances in Computational Imaging at Microwave and Millimetre-Wave Frequencies
Chair: Okan Yurduseven¹, Thomas Fromenteze²
¹Queen's University Belfast, ECIT, ²University of Limoges, Xlim

In this short-course, we will review modern advances in computational imaging and radar at microwave and millimeter-wave frequencies. This short course will first cover an overview of conventional imaging modalities, such as synthetic aperture radar (SAR) and phased array systems. Following, we will introduce the concept of computational imaging, from the design of unusual antennas for imaging to innovative image reconstruction algorithms. This shortcourse will present a unique opportunity for active discussion, interaction and information exchange. The proposed short-course aims to provide a platform for researchers from industry and academia working on or interested in the field of imaging and radar for an active exchange with the leading experts in those fields, to learn from cross-platform implementations, and to get ready to actively contribute to the next-level generation of microwave & millimeter-wave sensors and imagers.

Programme

General introduction to microwave and millimeter-wave computational imaging: Formalisms, Systems, and Image reconstruction
Okan Yurduseven¹
¹Queen’s University Belfast, ECIT

In this short-course, we will review modern advances in computational imaging and radar at microwave and millimeter-wave frequencies. This short course will first cover an overview of conventional imaging modalities, such as synthetic aperture radar (SAR) and phased array systems. Following, we will introduce the concept of computational imaging, from the design of unusual antennas for imaging to innovative image reconstruction algorithms. This shortcourse will present a unique opportunity for active discussion, interaction and information exchange. The proposed short-course aims to provide a platform for researchers from industry and academia working on or interested in the field of imaging and radar for an active exchange with the leading experts in those fields, to learn from cross-platform implementations, and to get ready to actively contribute to the next-level generation of microwave & millimeter-wave sensors and imagers.

Programme

New advances in computational imaging: Polarimetric imaging, phaseless imaging, and recent advances in antenna systems and k-space reconstruction techniques.
Thomas Fromenteze¹
¹University of Limoges, Xlim

Implementing Radar Target Stimulation on an Automotive Testbed
Michael Ernst Gadrieger¹, Helmut Schreiber², Wolfgang Bosch¹
¹Technical University Graz

Challenges of Radar Sensor Integration behind Coated Hang-on Parts
Michaela Ließ¹
¹BASF Coatings GmbH

New Methods for Validation of Radar Integration
Michael Jilg¹, Florian Baumgaertner²
¹Loccioni Gmbh, ²Daimler AG

Testing of Radar Sensors for Autonomous Driving in Soft- and Hardware-in-the-Loop Environments
Sebastian Graf¹
¹USPACE GmbH

Techniques for Multi-Dimensional Over-The-Air Radar Target Simulation
Thomas Dallmann¹
¹Fraunhofer Institute for RF Frequency Physics and Radar Techniques FHR

Next Generation Automotive Sensor Simulation Framework
COSMoSIm
Takashiro Yamagí²
²OTSIL Inc.

WaveFarer: Computing Raw Radar Returns with EM Simulation
Jeff Barney¹
¹Remcom

Some Issues to Overcome when Detecting Emotions from Face
Yigal Sharon¹, Yaniv Mama¹
¹Moodify

In this short-course, we will review modern advances in computational imaging and radar at microwave and millimeter-wave frequencies. This short course will first cover an overview of conventional imaging modalities, such as synthetic aperture radar (SAR) and phased array systems. Following, we will introduce the concept of computational imaging, from the design of unusual antennas for imaging to innovative image reconstruction algorithms. This shortcourse will present a unique opportunity for active discussion, interaction and information exchange. The proposed short-course aims to provide a platform for researchers from industry and academia working on or interested in the field of imaging and radar for an active exchange with the leading experts in those fields, to learn from cross-platform implementations, and to get ready to actively contribute to the next-level generation of microwave & millimeter-wave sensors and imagers.

Programme

General introduction to microwave and millimeter-wave computational imaging: Formalisms, Systems, and Image reconstruction
Okan Yurduseven¹
¹Queen’s University Belfast, ECIT

New advances in computational imaging: Polarimetric imaging, phaseless imaging, and recent advances in antenna systems and k-space reconstruction techniques.
Thomas Fromenteze¹
¹University of Limoges, Xlim

In this short-course, we will review modern advances in computational imaging and radar at microwave and millimeter-wave frequencies. This short course will first cover an overview of conventional imaging modalities, such as synthetic aperture radar (SAR) and phased array systems. Following, we will introduce the concept of computational imaging, from the design of unusual antennas for imaging to innovative image reconstruction algorithms. This shortcourse will present a unique opportunity for active discussion, interaction and information exchange. The proposed short-course aims to provide a platform for researchers from industry and academia working on or interested in the field of imaging and radar for an active exchange with the leading experts in those fields, to learn from cross-platform implementations, and to get ready to actively contribute to the next-level generation of microwave & millimeter-wave sensors and imagers.

Programme

New advances in computational imaging: Polarimetric imaging, phaseless imaging, and recent advances in antenna systems and k-space reconstruction techniques.
Thomas Fromenteze¹
¹University of Limoges, Xlim
More than one decade ago, Millimeter-wave Radar showed potentials for automotive applications, but during that time, the realization was based on very expensive niche technologies. Due to the improvements of frontend technologies and semiconductor technologies, during the last decade, the integration of Radar-on-chip operating at these frequencies became possible and led to compact and cheap radar sensors. Therefore, Millimeter-wave Radar found its way to a mass-market solution in automotive Radar.

This workshop will cover the full scope starting from the the requirements and potentials coming to the used technologies and circuits in SiGe and CMOS to frontend and finally antenna design.
In recent years, there have been many new technological developments that require the use of electromagnetic signals at millimetre-wave and terahertz frequencies. Such applications have included communications technologies (5G, IoT, etc), the automotive industry (Connected and Autonomous Vehicles - CAVs), security scanners and imagers, space-borne radiometers, medical diagnostics, etc. This has led to the need for new hardware to realise the systems necessary for these applications. A major building block for this hardware is waveguide, due to its inherent low loss, usability and technology readiness at these frequencies. New waveguide sizes and interfaces have recently been introduced specifically to enable the efficient exploitation of these frequencies - particularly, frequencies above 100 GHz. This, in turn, has led to the need for new measurement techniques to enable reliable and accurate measurements to be available at these frequencies.

This workshop will review the latest developments that are taking place for this waveguide technology and will focus on both the new waveguide sizes and interfaces that have been introduced to enable the efficient and reliable use of these frequencies by end-users. This includes activities by the IEEE and IEC standardisation bodies. The workshop will also present the current state of the art of the measurements - both using waveguide and quasi-optical techniques - that are available at millimetre-wave through to terahertz frequencies (i.e. from 30 GHz to at least 1.5 THz).

**Programme**

**The critical role for millimetre-wave and terahertz measurements (Keynote talk)**

James Watts¹

¹Consultant

**The new IEEE standards for waveguides above 110 GHz a review**

Nick Ridler¹

¹NPL

**The European NeWITT project - Best Practice Guide and software tool for waveguide connections at frequencies above 100 GHz**

Karsten Kuhlmann¹

¹Physikalisch-Technische Bundesanstalt (PTB)

**Impact of dimensional imperfections on waveguide measurements in the millimetre-wave and terahertz range**

Xiaobang Shang¹

¹National Physical Laboratory (NPL)

**Design considerations for an improved interface for millimeter waveguides**

Hans-Ulrich Nickel¹

¹Spinner GmbH

**Terahertz Waveguide Vector Network Analyser Measurement - IEC standardization and Traceability Research in Japan**

Masahiro Hotobe¹

¹NMIJ

**Network Analyser Instrumentation and Advanced Measurements at Millimetre-wave and Terahertz Frequencies**

Jon Martens¹

¹Anritsu

**Recent Developments in Waveguide Extender Heads and Interfaces to Enable Vector Network Analysis to 1.5 THz**

Jeffrey Hesler¹

¹VDI

**Quasi-optical measurements in the millimetre-wave and terahertz range**

Thomas Kleine-Ostmann¹

¹PTB
Rohde & Schwarz Tutorial Seminars & Technical Workshops

- Free to attend -

For more information, details and registration:
http://www.eumw.rohde-schwarz.com/

Location: 733+734

Tutorial Seminars – RF Basics in Test and Measurement

Tutorial abstract:
A sound understanding of RF and mmWave testing methods is a key factor for every mmWave engineer, helping them to successfully implement solutions and designs in mmWave and RF circuits. Moreover, digital communications engineering and mmWave engineering are merging more and more and becoming a cross-discipline. As a result, mmWave engineers are confronted with the challenge of how to master the territory of the former RF and digital communications world.

The Rohde & Schwarz seminars about RF basics in test and measurement will familiarize you with the elementary aspects of signal generators, spectrum analyzers and network analyzers. You will learn to benefit from the great flexibility of our T&M equipment when designing communications and radar systems.

New this year is a seminar on realtime spectrum analysis that will introduce you to the methods for debugging RF and mmWave circuits in the time and the frequency domain.

Using vector network analyzers for component testing and evaluation and applying various calibration techniques common in advanced network analysis lets you characterize mmWave and RF components, which are necessary for mmWave designs and digital communications systems, to the highest precision.

Tuesday 1st October 2019
Fundamentals of Signal Generators and Oscillators (YIG vs. VCO)
Tuesday 1st October 2019
Fundamentals of Spectrum Analysis

Wednesday 2nd October 2019
Introduction to Digital Signals and Digital Modulation

Wednesday 2nd October 2019
Realtime Spectrum Analysis Embedded in Advanced Spectrum Analyzers

Thursday 3rd October 2019
Fundamentals of Vector Network Analysis

Thursday 3rd October 2019
Calibration in Vector Network Analysis

Technical Workshops

Tuesday 1st October 2019
13:30 – 17:30

Wednesday 2nd October 2019
13:30 – 17:30

Thursday 3rd October 2019
12:30 – 16:30

Contents of the technical workshops will be announced later.
MathWorks Hands-on Workshops

- Free to attend -

Location: 735+736

1st – 3rd October 2019

Join one or more of the 90-minutes MathWorks hands-on workshops on Tuesday, Wednesday, and Thursday (October 1, 2, 3) at the European Microwave week.

Topics include: using MATLAB® for designing and testing 5G and WLAN systems, antenna and antenna array design for radar applications, power amplifier modeling and transmitter linearization techniques, using Software defined radios (SDR) for rapid prototyping and over the air testing, plus lots more!

These workshops are free to attend, do not require familiarity MATLAB, and if you bring your own laptop you can get a hands-on experience under the supervision of MathWorks experts.

Just register for a free exhibition pass for European Microwave Week and sign up to our workshops here:
https://www.mathworks.com/MATLAB-Workshops-2019

EuMW MicroApps 2019

Free Admission
with Exhibition and Conference Badges

1st - 3rd October
MicroApps Theatre

Welcome to the ninth annual European Microwave Week (EuMW) Microwave Application Seminars (MicroApps), sponsored by National Instruments, Rohde & Schwarz, and Horizon House. MicroApps will be held from Tuesday, October 1st through Thursday, October 3rd, 2019 in the MicroApps Theatre, which is located within the exhibition floor, making it a convenient stop while attending EuMW.

MicroApps are 20-minute exhibitor technical presentations that provide an opportunity for EuMW attendees to experience state-of-the-art applications, products, design techniques, and processes of interest to the RF and microwave community.

2019 MicroApps highlights include:

- Keynote by Dr. Steve Cripps, Cardiff University, UK
- Industry workshops
- A variety of practical application topics describing novel products and processes.

Once finalized, a complete agenda will be posted on the EuMW MicroApps website at www.eumicroapps.com and published in the official EuMW Show Guide. Additional printed copies will also be available on site at the EuMW registration desks.

MicroApps admission is free for both exhibition-only and conference badges. Also included is a complimentary web download of the papers presented and bottled water.

We look forward to seeing you at EuMW 2019 in the MicroApps Theatre.

Antti Lautanen
EuMW 2019 MicroApps Co-chair

www.eumicroapps.com
<table>
<thead>
<tr>
<th>Room</th>
<th>09:00-10:40</th>
<th>Coffee Break</th>
<th>11:20-13:00</th>
<th>Lunch</th>
<th>14:00-15:40</th>
<th>Coffee Break</th>
<th>16:20-18:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>741A</td>
<td>WS-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recent Advances in SiGe BiCMOS: Technologies, Modelling and Circuits for 5G, radar and imaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>741 BC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>721+722</td>
<td>WS-02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RF Techniques for 5G Applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>723+724</td>
<td>WS-09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>THz Applications: Present and Future</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>725+726</td>
<td>WS-05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Microwave measurements at systems, components and materials levels: a global approach to improve energy efficiency of the next generation of electronic devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>727+728</td>
<td>WS-04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Real Amplifier Devices for 5G New Radios</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>731+732</td>
<td>WS-03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Microwave Characterization and Modelling at Nano and Micro-Scale of Advanced Materials to Enhance Emerging Products Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>733+734</td>
<td>SS-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fundamentals of Microwave PA Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>735+736</td>
<td>SS-02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Silicon-Based Integrated Technology Platform for Millimeter Wave (MMW) and Terahertz (THz) Applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>737+738</td>
<td>WS-06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Future Wireless Technologies in the Terahertz and Optical Frequency Bands</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>WS-07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>New materials and technologies for reconfigurable RF components</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Room</td>
<td>EuMIC01 Integrated mmWave circuits on BiCMOS &amp; CMOS</td>
<td>EuMIC04 EuMIC Opening Session</td>
<td>EuMIC05 New GaN process development for improved thermal and efficiency properties</td>
<td>EuMIC08 Advanced Solutions for Integrated Power Amplifiers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------</td>
<td>---------------------------------------------------</td>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:30-10:10</td>
<td>N01</td>
<td>EuMIC02 GaN Characterisation and Modelling</td>
<td>EuMIC06 Nonlinear CAD</td>
<td>EuMIC09 Modelling and Extraction Techniques</td>
<td>EuMIC Get Together</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S01/S02/S03</td>
<td>EuMIC03 GaN technology and device characterization for improved circuit demonstrators</td>
<td>EuMIC07 System-Oriented mm-wave ICs</td>
<td>EuMIC10 mm-wave Transceiver Components</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E01</td>
<td>EuMIC02 GaN Characterisation and Modelling</td>
<td>EuMIC06 Nonlinear CAD</td>
<td>EuMIC09 Modelling and Extraction Techniques</td>
<td>EuMIC Get Together</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E02</td>
<td>EuMIC03 GaN technology and device characterization for improved circuit demonstrators</td>
<td>EuMIC07 System-Oriented mm-wave ICs</td>
<td>EuMIC10 mm-wave Transceiver Components</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E03</td>
<td>Advanced CAD Tools and Techniques for the System Co-Design of Smart Antenna and Transmitter Modules</td>
<td>WM-01 Phase Change Material for Microwave Applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E04</td>
<td>WM-01 Phase Change Material for Microwave Applications</td>
<td>WM-02 Phase Change Material for Microwave Applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E05</td>
<td>WM-03 Current and Future Use of Spectrum by PMSE</td>
<td>WM-04 Integration and multi-physics challenges in 5G mm-wave system design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E06</td>
<td>WM-05 Terahertz Devices, Circuits and Systems: from fundamentals to applications</td>
<td>WM-06 Recent Advances in Technologies and Practical Realizations of Compact Filters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E07</td>
<td>WM-06 Recent Advances in Technologies and Practical Realizations of Compact Filters</td>
<td>WM-07 Technologies and modelling for electromagnetically-mediated medical treatments: at the beginning of the electroceuticals era</td>
<td>WM-08 Advanced Microwave Systems for Emerging Healthcare Applications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E08</td>
<td>WM-07 Technologies and modelling for electromagnetically-mediated medical treatments: at the beginning of the electroceuticals era</td>
<td>WM-08 Advanced Microwave Systems for Emerging Healthcare Applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>741A</td>
<td>Automotive Forum</td>
<td>Automotive Forum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>741 BC</td>
<td>WM-09 New challenges and new trends mixing active and passive devices in silicon technology: from components to tunable RF functions</td>
<td>SM-01 Multibeam Antennas and Beamforming Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# CONFERENCE SESSIONS MATRIX - TUESDAY

<table>
<thead>
<tr>
<th>Room</th>
<th>08:30-10:10</th>
<th>Coffee Break</th>
<th>10:50-12:30</th>
<th>Lunch</th>
<th>13:50-15:30</th>
<th>Coffee Break</th>
<th>16:10-17:50</th>
<th>18:30 - 21:30</th>
</tr>
</thead>
<tbody>
<tr>
<td>N01</td>
<td>EuMW01 EuMW/EuMC Opening Session (End: 12:45)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EuMIC13 EuMC Closing session (End: 18:10)</td>
</tr>
<tr>
<td>S01/02/03</td>
<td>EuMC/EuMIC01 Low-noise amplifiers</td>
<td></td>
<td>EuMIC03 Microwave Integrated PA Technologies</td>
<td></td>
<td>EuMC06 Applied Computational Electromagnetics</td>
<td>EuMW Welcome Reception</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E01</td>
<td>EuMIC11 ICs Beyond 100 GHz</td>
<td></td>
<td>EuMC/EuMIC04 Active Circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E02</td>
<td>EuMC/EuMIC02 Photonic-Electronic Devices</td>
<td></td>
<td>EuMC05 Sub THz Components and Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E03</td>
<td>EuMC01 Passive Devices - Theory and Applications</td>
<td></td>
<td>EuMC03 Battery-Less Circuits for Emerging Technologies</td>
<td></td>
<td>EuMC07 UHF, UWB and mmWave Techniques for Autonomous Sensors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E04</td>
<td>EuMW Career Platform Special Session The European Microwave Industry Market and Professional Opportunities</td>
<td></td>
<td>WiM</td>
<td></td>
<td>WiM CNAM Museum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E05</td>
<td>EuMC02 High Directivity Antennas</td>
<td></td>
<td>EuMC05 Novel Antenna Materials</td>
<td></td>
<td>EuMC09 Emerging Antenna Concepts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E07</td>
<td>EuMC01 End: 12:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E08</td>
<td>EuMW Career Platform</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>741A</td>
<td>STu-01 Antenna Booster Technology for IoT Applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>741 BC</td>
<td>Doctoral School T.Taris - B. Reig</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>746</td>
<td>Doctoral School R. Gomez Garcia - L. Boccia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>Student School Presentation + P.Ferrari</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>Student School R. Gomez Garcia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>Student School A. Lisboa Da Souza</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>Student School Justin King</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>EuMW Career Platform</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>EuMW Career Platform</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>EuMW Career Platform</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>Student Design Competition AMCAD/PA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>Student Design Competition AMCAD/PA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>Student Design Competition AMPLEON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td>Student Design Competition AMPLEON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

www.eumweek.com | 99
<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30-10:10 Coffee</td>
<td>N01 EuRAD01</td>
<td>EuRAD Opening Session</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>The Defence, Security and Space Forum</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>The Defence, Security and Space Forum</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>Joint EuMC/ EuMIC/Cocktail Reception</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:30-10:10 Coffee</td>
<td>E01 EuMC10</td>
<td>Biomedical Applications</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>EuMC/EuRAD01 Diverse Radar Applications</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>EuMC/EuRAD03 Space and UAV applications</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>EuMC27 Outphasing and Doherty Power Amplifiers</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:30-10:10 Coffee</td>
<td>E02 EuMC11</td>
<td>Special Session AMPC</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>EuMC16 Transmitter/Receiver Circuits</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>EuMC21 GaN HEMT Based Power Amplifiers</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>EuMC22 Near-Field and Far-Field Millimeter-Wave Measurements</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td>EuMC28 Calibration and Characterization Techniques</td>
</tr>
<tr>
<td>08:30-10:10 Coffee</td>
<td>E03 EuMC12</td>
<td>MEMS, Phase-Change and Oxide Material Devices</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>EuMC17 Special Session LAMC</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>EuMC22 Near-Field and Far-Field Millimeter-Wave Measurements</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>EuMC29 Techniques and Technologies for the Enhancement of WPT Systems</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:30-10:10 Coffee</td>
<td>E04 EuMC13</td>
<td>Planar Filters I</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>EuMC19 Non-Planar Filters II</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>EuMC24 Planar Filters II</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>EuMC30 Planar Filters III</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:30-10:10 Coffee</td>
<td>E05 EuMC14</td>
<td>Focused Session Electromagnetic Methods for Monitoring and Manipulating Cells and Tissues</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>EuMC20 Antennas for Communication</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>EuMC25 Antenna Arrays for 5G</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>EuMC31 Active Antenna Arrays</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td>EuMC32 Numerical Methods in Microwave Technology</td>
</tr>
<tr>
<td>08:30-10:10 Coffee</td>
<td>E06 EuMC15</td>
<td>Antennas for Communication</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>EuMC/EuRAD02 Antennas for Radar Application</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>EuMC25 Antenna Arrays for 5G</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>EuMC31 Active Antenna Arrays</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td>EuMC32 Numerical Methods in Microwave Technology</td>
</tr>
<tr>
<td>08:30-10:10 Coffee</td>
<td>E07 EuMC16</td>
<td>EuMW Career Platform</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>EuMW Career Platform</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>EuMW Career Platform</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>EuMW Career Platform</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td>EuMW Career Platform</td>
</tr>
<tr>
<td>08:30-10:10 Coffee</td>
<td>E08 EuMC17</td>
<td>Student Design Competition ELLIPTICA</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>Student/PhD School Hands-on Experience: 9:00 - 12:30</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>Student/PhD School Hands-on Experience</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>Student/PhD School Hands-on Experience</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td>Student/PhD School Hands-on Experience</td>
</tr>
<tr>
<td>08:30-10:10 Coffee</td>
<td>E09 EuMC18</td>
<td>Interactive Session</td>
</tr>
<tr>
<td>10:50-12:30 Lunch</td>
<td></td>
<td>Interactive Session</td>
</tr>
<tr>
<td>13:50-15:30 Coffee</td>
<td></td>
<td>Interactive Session</td>
</tr>
<tr>
<td>16:10-17:50</td>
<td></td>
<td>Interactive Session</td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td></td>
<td>Interactive Session</td>
</tr>
</tbody>
</table>

**WW-01**
Advanced passive radar techniques and applications

**WW-02**
Radar Interference and Coexistence
<table>
<thead>
<tr>
<th>Room</th>
<th>08:30-10:10</th>
<th>Coffee Break</th>
<th>10:50-12:30</th>
<th>Lunch</th>
<th>13:50-15:30</th>
<th>Coffee Break</th>
<th>16:10-17:50</th>
</tr>
</thead>
<tbody>
<tr>
<td>E01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EuMW02</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EuMW/EuMC Closing Session</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E02</td>
<td>EuMC33</td>
<td>EuMC38</td>
<td></td>
<td></td>
<td></td>
<td>EuRAD07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Microwave Sensing for Biomedical Applications</td>
<td>Communication Systems</td>
<td></td>
<td></td>
<td>Automotive Radar Models and Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E03</td>
<td>EuMC/EuRAD04</td>
<td>EuMC/EuRAD05</td>
<td></td>
<td></td>
<td></td>
<td>EuRAD08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mmW Systems</td>
<td>Measurement and Modeling of Electromagnetic Field Scattering</td>
<td></td>
<td></td>
<td>Advanced Detection for Distributed Radar Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E04</td>
<td>EuMC34</td>
<td>EuMC39</td>
<td></td>
<td></td>
<td></td>
<td>EuRAD09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metasurface Based Antennas and Absorbers</td>
<td>Metamaterial Based Devices</td>
<td></td>
<td></td>
<td>FMCW and Radar Communications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E05</td>
<td>EuRAD04</td>
<td>EuRAD05</td>
<td></td>
<td></td>
<td></td>
<td>STh-01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radar Technology</td>
<td>Signal Processing for Positioning, Calibration and Antenna Steering</td>
<td></td>
<td></td>
<td>Modern Advances in Computational Imaging at Microwave and Millimeter-Wave Frequencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E06</td>
<td>EuMC35</td>
<td>EuMC40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIW Technology for Passive Components</td>
<td>3D Printing and Additive Manufacturing Techniques For RF-Components</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E07</td>
<td>EuMC36</td>
<td>EuMC/EuRAD06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supply Modulated Power Amplifiers</td>
<td>Integrated Antennas and Systems-in-Package</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E08</td>
<td>EuMC37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phased Array Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WTh-02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WTh-02</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test Procedures &amp; Solutions, as well as simulation &amp; Validation of sensor functions and Entire Adas Systems E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>741A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WTh-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WTh-01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Automotive Radar Systems and Signal Processing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>741BC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd European On-Wafer User's Forum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student challenge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Student challenge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Poster Presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition Hall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EuMC/EuRAD07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EuMC/EuRAD07</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interactive Session</td>
<td></td>
<td></td>
<td></td>
<td>Interactive Session</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EuRAD06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Room</td>
<td>08:30-10:10</td>
<td>Coffee Break</td>
<td>10:50-12:30</td>
<td>Lunch</td>
<td>13:50-15:30</td>
<td>Coffee Break</td>
<td>16:10-17:50</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-------------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------------</td>
</tr>
<tr>
<td>N01</td>
<td>EuRAD10 Radar micro-Doppler Detection and Classification</td>
<td></td>
<td>EuRAD12 Waveforms and Radar Networks</td>
<td></td>
<td>EuRAD15 EuRAD Closing Session</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S01/S02/</td>
<td></td>
<td></td>
<td></td>
<td>Lunch EuRAD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S03/S03</td>
<td>EuRAD11 Material Characterization using Radar Methods</td>
<td></td>
<td>EuRAD13 Automotive MIMO and Back-Projection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E02</td>
<td>EuRAD14 Focus Session Modern Advances in Imaging at Microwave, Millimeter-wave and Terahertz Frequencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>731-734</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WF-01</td>
<td>Automotive Radar Frontend Technologies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>737-738</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WF-02</td>
<td>Measurements and Waveguides for Millimetre-wave and Terahertz Frequencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Room</td>
<td>Tuesday 1st October</td>
<td>Wednesday 2nd October</td>
<td>Thursday 3rd October</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>----------</td>
<td>---------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>733+734</td>
<td>09:30 - 12:45</td>
<td>09:30 - 13:15</td>
<td>09:30 - 12:15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rohde &amp; Schwarz Tutorial Seminars</td>
<td>Rohde &amp; Schwarz Tutorial Seminars</td>
<td>Rohde &amp; Schwarz Tutorial Seminars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>13:30 - 17:30</td>
<td>13:30 - 17:30</td>
<td>12:30 - 16:30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>735+736</td>
<td>09:30 - 17:30</td>
<td>09:30 - 17:30</td>
<td>09:30 - 17:30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MathWorks Workshops</td>
<td>MathWorks Workshops</td>
<td>MathWorks Workshops</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Future EuMW 2020:**

- **European Microwave Week**
- **Jaarbeurs Utrecht**
- **The Netherlands**
- **13-18 September 2020**
- **Welcome to Utrecht!**
<table>
<thead>
<tr>
<th>Exhibitor Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>China Electronics Technology Instruments Co., Ltd</td>
</tr>
<tr>
<td>Chengdu Yaze Exhibition Service Co., Ltd</td>
</tr>
<tr>
<td>Chengdu Ganide Technology Co. Ltd</td>
</tr>
<tr>
<td>Chengdu AINFO Inc.</td>
</tr>
<tr>
<td>Cambridge University Press</td>
</tr>
<tr>
<td>Chelton Telecom and Microwave</td>
</tr>
<tr>
<td>Chengdu ANIFO Inc.</td>
</tr>
<tr>
<td>Chengdu Garide Technology Co. Ltd</td>
</tr>
<tr>
<td>Chengdu Yaze Exhibition Service Co., Ltd</td>
</tr>
<tr>
<td>China Electronics Technology Instruments Co., Ltd (ETC)</td>
</tr>
<tr>
<td>Cicor Management AG-Cicor Group</td>
</tr>
<tr>
<td>CISTEME</td>
</tr>
<tr>
<td>Coltrak</td>
</tr>
<tr>
<td>Copper Mountain Technologies</td>
</tr>
<tr>
<td>CST-Computer Simulation Technology GmbH</td>
</tr>
<tr>
<td>Dallcap Tech Co., Ltd</td>
</tr>
<tr>
<td>DICONEX AG</td>
</tr>
<tr>
<td>EBN ELEKTRONIK GMBH &amp; CO. KG</td>
</tr>
<tr>
<td>ECHO Microwave</td>
</tr>
<tr>
<td>EGDE</td>
</tr>
<tr>
<td>ElTec Comp LLC</td>
</tr>
<tr>
<td>Electronic Specifier</td>
</tr>
<tr>
<td>Electronic Specifier Ltd.</td>
</tr>
<tr>
<td>Electronique Composants &amp; Instrumentation</td>
</tr>
<tr>
<td>Electroniques Magazine</td>
</tr>
<tr>
<td>ELHYTE</td>
</tr>
<tr>
<td>EMCoS Ltd</td>
</tr>
<tr>
<td>EpRaIV</td>
</tr>
<tr>
<td>Equipements Scientifiques</td>
</tr>
<tr>
<td>ERZQA Technologies, SL</td>
</tr>
<tr>
<td>European Space Agency (ESA)</td>
</tr>
<tr>
<td>everythingRF</td>
</tr>
<tr>
<td>Exelis</td>
</tr>
<tr>
<td>Farran</td>
</tr>
<tr>
<td>Farran Technology Ltd.</td>
</tr>
<tr>
<td>Ferdinand-Braun-Institut</td>
</tr>
<tr>
<td>FH Microwave</td>
</tr>
<tr>
<td>FH Microwave SARL</td>
</tr>
<tr>
<td>Filtronic</td>
</tr>
<tr>
<td>Flexguide</td>
</tr>
<tr>
<td>Focus Microwaves</td>
</tr>
<tr>
<td>Formfactor</td>
</tr>
<tr>
<td>Fraunhofer</td>
</tr>
<tr>
<td>Frontlink Technologies Inc.</td>
</tr>
<tr>
<td>Fujichu Micable Electronic Technology Co., Ltd</td>
</tr>
<tr>
<td>FYLA LASER s.l.</td>
</tr>
<tr>
<td>Gapwaves AB</td>
</tr>
<tr>
<td>Greenleaf Corporation</td>
</tr>
<tr>
<td>Greenray Industries</td>
</tr>
<tr>
<td>GTID</td>
</tr>
<tr>
<td>Hermetic Solutions Group</td>
</tr>
<tr>
<td>Ifs-Praxis</td>
</tr>
<tr>
<td>High Frequency Electronics</td>
</tr>
<tr>
<td>Hotzworth Instrumentation</td>
</tr>
<tr>
<td>HUBER + SUHNER AG</td>
</tr>
<tr>
<td>Hytem</td>
</tr>
<tr>
<td>IEMN</td>
</tr>
<tr>
<td>IMST GmbH</td>
</tr>
<tr>
<td>Imerton Inc.</td>
</tr>
<tr>
<td>Innovations For High Performance Microelectronics</td>
</tr>
<tr>
<td>INVEOS</td>
</tr>
<tr>
<td>Intech Microwaves S.R.L.</td>
</tr>
<tr>
<td>Iron Tech Inc.</td>
</tr>
<tr>
<td>Isola GmbH</td>
</tr>
<tr>
<td>IFF CO., LTD</td>
</tr>
<tr>
<td>IW Microwave Products Division</td>
</tr>
<tr>
<td>Jet Metal Technologies</td>
</tr>
<tr>
<td>Keysight Technologies</td>
</tr>
<tr>
<td>Knowles Precision Devices</td>
</tr>
<tr>
<td>KOMA Europe GmbH</td>
</tr>
<tr>
<td>Korea Taconic</td>
</tr>
<tr>
<td>KOSTEGSYS Co., Ltd</td>
</tr>
<tr>
<td>Kuhme Electronic GmbH</td>
</tr>
<tr>
<td>Kyocera Fineceramics</td>
</tr>
<tr>
<td>L3 Technologies</td>
</tr>
<tr>
<td>Leandra S.r.l.</td>
</tr>
<tr>
<td>Liebler Institut</td>
</tr>
<tr>
<td>LPIF-Laser &amp; Electronics AG</td>
</tr>
<tr>
<td>Lucas Signatone Corp.</td>
</tr>
<tr>
<td>MACOM</td>
</tr>
<tr>
<td>Magic Xalit Ltd</td>
</tr>
<tr>
<td>Maltotech Electronique SAS</td>
</tr>
<tr>
<td>Mathworks S.A.S</td>
</tr>
<tr>
<td>Maury Microwave Corp.</td>
</tr>
<tr>
<td>Measures</td>
</tr>
<tr>
<td>Measure Ltd</td>
</tr>
<tr>
<td>META Corp</td>
</tr>
<tr>
<td>Mician Global Engineering</td>
</tr>
<tr>
<td>Mician GmbH</td>
</tr>
<tr>
<td>Micro System Engineering GmbH</td>
</tr>
<tr>
<td>Micro Systems Technologies Management AG (MST)</td>
</tr>
<tr>
<td>Microwave Applications Group</td>
</tr>
<tr>
<td>Microwave Engineering Europe</td>
</tr>
<tr>
<td>Microwave Journal</td>
</tr>
<tr>
<td>Microwave Product Digest</td>
</tr>
<tr>
<td>Microwave Products Group</td>
</tr>
<tr>
<td>Microwave Systems JSC</td>
</tr>
<tr>
<td>Microwaves &amp; RF</td>
</tr>
<tr>
<td>MICROELECTRODE</td>
</tr>
<tr>
<td>MIG Microwave Innovation Group</td>
</tr>
<tr>
<td>Milpex France</td>
</tr>
<tr>
<td>Millwave Silicon Solutions</td>
</tr>
<tr>
<td>Millwary Microelectronics</td>
</tr>
<tr>
<td>MISO Tech</td>
</tr>
<tr>
<td>Mitren Inc.</td>
</tr>
<tr>
<td>Mouser Electronics</td>
</tr>
<tr>
<td>MFI Corporation</td>
</tr>
<tr>
<td>MTR S.R.L.</td>
</tr>
<tr>
<td>Murata Software Co., Ltd</td>
</tr>
<tr>
<td>NARDKA-MITEQ</td>
</tr>
<tr>
<td>National Instruments</td>
</tr>
<tr>
<td>NELEIC SAVAGE Systeme SA</td>
</tr>
<tr>
<td>Nippon Pillar Packing Co., Ltd</td>
</tr>
<tr>
<td>NXP Semiconductors</td>
</tr>
<tr>
<td>ONMIC</td>
</tr>
<tr>
<td>Optentri Ltd.</td>
</tr>
<tr>
<td>P2M</td>
</tr>
<tr>
<td>Parquall Microwave Systems SRL</td>
</tr>
<tr>
<td>Phase 2 Microwave Ltd</td>
</tr>
<tr>
<td>Pickering Interfaces</td>
</tr>
<tr>
<td>Pico Technology</td>
</tr>
<tr>
<td>Planar Monolithic Industries</td>
</tr>
<tr>
<td>Plansee SE</td>
</tr>
<tr>
<td>Promixy Dy</td>
</tr>
<tr>
<td>Pure Pro Technology Co., Ltd</td>
</tr>
<tr>
<td>PYLA</td>
</tr>
<tr>
<td>Qotana Technologies Co., Ltd</td>
</tr>
<tr>
<td>Radar Systems Technology Inc.</td>
</tr>
<tr>
<td>RADWALL</td>
</tr>
<tr>
<td>Remcom Inc.</td>
</tr>
<tr>
<td>Research Fab Microelectronics Germany (FMD)</td>
</tr>
<tr>
<td>RF Core</td>
</tr>
<tr>
<td>RF Core</td>
</tr>
<tr>
<td>RF MORECOM COREA Co., Ltd</td>
</tr>
<tr>
<td>RF-Lambda</td>
</tr>
<tr>
<td>RFMW Europe Ltd.</td>
</tr>
<tr>
<td>Rohde &amp; Schwarz GmbH &amp; Co. KG</td>
</tr>
<tr>
<td>Rosenberger Hochfrequenztechnik GmbH &amp; Co. KG</td>
</tr>
<tr>
<td>S2P - Smart Plastic Products</td>
</tr>
<tr>
<td>Schmid &amp; Partner Engineering AG</td>
</tr>
<tr>
<td>Schott AG</td>
</tr>
<tr>
<td>Sentec Hanol Co., Ltd</td>
</tr>
<tr>
<td>Shanghai HuaJin Communication Technologies Co., Ltd</td>
</tr>
<tr>
<td>Shanghai HuaJing Communication Technologies Co., Ltd</td>
</tr>
<tr>
<td>Shenzen Superlink Technology Co., Ltd</td>
</tr>
<tr>
<td>Silicon Radia GmbH</td>
</tr>
<tr>
<td>Southwest Microwave</td>
</tr>
<tr>
<td>Spectrum Elektrotechnik GmbH</td>
</tr>
<tr>
<td>STACEM</td>
</tr>
<tr>
<td>Statelridge Corporation</td>
</tr>
<tr>
<td>Sumitomo Electric Device Innovations Inc</td>
</tr>
<tr>
<td>Sumitomo Electric Europe Ltd.</td>
</tr>
<tr>
<td>Sumitomo Electric Industries</td>
</tr>
<tr>
<td>Sungian Electronics &amp; Communications Co., Ltd</td>
</tr>
<tr>
<td>SURON A.C.A.</td>
</tr>
<tr>
<td>Szechuan Huanhua Semiconductor Co., Ltd</td>
</tr>
<tr>
<td>Synterks</td>
</tr>
<tr>
<td>TECH-INTER</td>
</tr>
<tr>
<td>Tech-X Corporation</td>
</tr>
<tr>
<td>Tecnocom S.R.L.</td>
</tr>
<tr>
<td>Teleonie Defense Electronics</td>
</tr>
<tr>
<td>Televies Corporation</td>
</tr>
<tr>
<td>The 2020 IEEE MTT-S International Microwave Symposium (IMS)</td>
</tr>
<tr>
<td>ThN Defence, Safety and Security</td>
</tr>
<tr>
<td>Toeyes Technology Co., Ltd</td>
</tr>
<tr>
<td>Transcom, Inc.</td>
</tr>
<tr>
<td>Translab Technologies</td>
</tr>
<tr>
<td>Tri-light Microwave AB</td>
</tr>
<tr>
<td>Transec, Inc.</td>
</tr>
<tr>
<td>United Monolithic Semiconductors SANS</td>
</tr>
<tr>
<td>Varoprint AG</td>
</tr>
<tr>
<td>Vector Telecom Pty Ltd</td>
</tr>
<tr>
<td>VA Electronic GmbH</td>
</tr>
<tr>
<td>Virginia Diodes Inc.</td>
</tr>
<tr>
<td>Vishay Electronic GmbH</td>
</tr>
<tr>
<td>WAVEPIA Co., Ltd</td>
</tr>
<tr>
<td>Wevercom Co., Ltd</td>
</tr>
<tr>
<td>WIN Semiconductors Corp.</td>
</tr>
<tr>
<td>WPL-B d.o.o.</td>
</tr>
<tr>
<td>Wurth Elektronik eGes GmbH &amp; Co. KG</td>
</tr>
<tr>
<td>XLM</td>
</tr>
<tr>
<td>Yale Development</td>
</tr>
<tr>
<td>Zhejiang Wazam New Materials Co., Ltd</td>
</tr>
</tbody>
</table>

The exhibitor list is correct at the time of going to press. It is subject to change.

For up-to-date information visit: [www.eumweek.com](http://www.eumweek.com)