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**European Microwave Week Future Events**

EuMW 2016 - London
EuMW 2017 - Nuremberg

*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 18th European Microwave Week


Our motto “Freedom Through Microwaves” expresses the concept of modern living where microwave technologies are opening up new frontiers that will govern how individuals and objects communicate, sense and move. The 'Connected Humans' sector is developing and evolving – join us in Paris to discover innovations and new paradigms for the microwave community as we look towards Horizon 2020.

EuMW is the premier microwave event in Europe, bringing together the microwave community from around the world. The week comprises:
• the 45th European Microwave Conference (EuMC) — September 7th to 10th
• the 10th European Microwave Integrated Circuits Conference (EuMIC) — September 7th and September 8th
• the 12th European Radar Conference (EuRAD) — September 9th to September 11th

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 Forum continues to be a major event. This year the Forum will focus on the design and deployment of RF systems for unmanned aerial vehicles. An important element of EuMW is the European Microwave Exhibition, the largest microwave and RF trade show in Europe. EuMW 2015 will see an estimated 5,000 visitors, with 1,700 – 2,000 conference delegates and in excess of 300 international exhibitors.

Around 1,000 papers were submitted for review to the three conferences from more than 50 countries. The technical programme includes 86 technical sessions, 424 oral papers and 96 posters, 5 special sessions and 7 focused sessions. The opening and closing plenary sessions of each of the three conferences will feature keynote lectures delivered by internationally renowned leaders in their respective fields.

The opening session of the week is scheduled as usual on Tuesday morning. After the welcome addresses, two keynote lectures will be presented. Bruno Le Stradic from Airbus DS Space Systems will speak on “Space antennas on satellites, for Telecommunications and Earth Observations missions: past evolutions and future trends”. This first keynote will be followed by the talk of Laurent Philippou from Thales Alenia Space (TAS) who will present “30 years of innovation in TAS radar altimetry product line for Earth Climate Monitoring”.

During the closing session of EuMW Clément Dudal and Céline Loisel from the French Space Agency (CNES) will speak on the ESA/CNES/ DLR Rosetta mission which successfully reached the 67P Churyumov-Gerasimenko comet after a 10 year journey. A lively expert insight covering the embedded RF electronics which led to the success of this fascinating space endeavor will be presented. Final remarks from EuMW Chair, EuMA President and the invitation to EuMW 2016 in London will conclude the Closing Ceremony.

Several events will occur in parallel with the conference sessions. Two student competitions will be take place during the week:
• The Student Challenge is a competitive event where teams of Bachelor, Master and Doctoral students are invited to propose an appealing topic/idea in the wide and challenging field of microwaves, inspired by papers presented at EuMW. The Prize of the Student Challenge is sponsored by Thales Nederland B.V.
• The Student Design Competition involves Master and Doctoral students designing and measuring a piece of equipment developed during the conference. This year an ISM transmitter for the remote empowering of passive receivers is at stake. The prototypes will be judged by a jury. Measurement facilities will be provided by Keysight Technologies. The Prize of the Student Design competition is sponsored by Cobham Aerospace Communications.

EuMW 2015 will continue the Career Platform initiative launched in Nuremberg in 2013, with the aim of fostering the dynamic between young researchers, engineers and the job market within the field of microwaves. A dedicated area will be reserved for sharing and exchange. New, special sessions will also be held on industrial market analysis, career development and recruitment strategies. EuMW 2015 will also launch a unique e-Platform initiative with the ambition of offering the RF and Microwave community a job portal on a European scale.

The well-established Women in Engineering event, co-sponsored by the IEEE MTT-Society, will include a panel session focused on exploiting microwaves in the area of fashion (fashionable and wearable technology), arts and gastronomy and will end with a guided tour of a fashion workshop.

EuMW 2015 will be promoting several social events including our annual Welcome Reception sponsored by Keysight Technologies. All conference delegates and invited exhibitors are welcome to the EuMW 2015 Welcome Reception on Tuesday 8th September in Espace Maillot, Level 2 from 18:30 hrs. Entry is by conference badge or invitation only. In addition, you will be invited to join us for an unforgettable cruise on the River Seine, including a cocktail reception on board a charming Paris Bâteaux Mouches, which will transport you through the most fascinating landmarks of the city enchanted by the light of the sunset. Registration is limited. Don’t miss this unforgettable experience that can be shared with relatives, friends and colleagues!

Enjoy “La ville Lumière” at the EuMW 2015.

Hervé Aubert, General Chairman
Promoting European Microwaves

Archiving through the Knowledge Centre and Archival DVDs

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- Future events
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  2016 - London
  2017 - Nuremberg
  2018 - Madrid

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

Join the EuMA Community
Welcome from the President of the European Microwave Association

Welcome to Paris 2015 on behalf of the European Microwave Association (EuMA)! EuMA is the organisation behind the European Microwave Week, our mission is to promote microwaves in Europe and to foster networking between microwave scientists and engineers in Europe. We are pursuing this in various ways but our key event is the European Microwave Week.

For those who are not familiar with EuMA: We are open to membership for all working in the field of microwaves, particularly from Europe, but also from around the world. The 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, such as reduced fees for attending the Week and other EuMA-sponsored conferences and workshops, you will have access to our website which provides an archive of publications and the on-line version of the International Journal on Microwave and Wireless Technologies as well as 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 that form 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 organized by our long-standing partner Horizon House forms an integral part of it.

When we booked the conference centre in Paris quite some time ago, it was the CNIT in La Défense, as in 2010 and the years before. Then, in March 2014 only we were informed that the CNIT would be put out of operation and we had to rearrange things at a very tight time schedule. This is the reason why the Week is held early September this year and why we are meeting in the Palais de Congrès, much closer to the heart of the city!

As you can imagine, preparing and hosting the EuMW is a major effort, from paper submission and review to the on-site organization at the venue, and this is accomplished by a team of volunteers year by year. Therefore, my special and sincere thanks go to Hervé Aubert, 2015 General Chair, to Christian Person, General TPC Chair, and to Fabio Coccetti, Treasurer, to Serge Verdeyme and Jean François Villemazet, EuMC Chair and Vice Chair, to Eric Kerhervé and Didier Floriot, EuMIC Chair and Vice Chair, and to Laurent Ferro-Famil and Jean Marc Goutoule, EuRAD Chair and Vice Chair - just to name a few on behalf of the entire team. They all have been working hard to set up an outstanding technical and scientific programme for you and to make your stay in Paris exciting and enjoyable. Thank you!

Paris is always worth a visit, even without a microwave event taking place there. This is true for Europeans as well as for visitors from overseas. The conferences in Paris have always been highlights with major peaks in attendance and I am sure this will come true also in 2015.

Finally, as every year, we hope you will not only get exciting ideas and new insights from presentations and posters but also find enough time to meet with colleagues and friends. Join us and see you in Paris!

Wolfgang Heinrich
President
European Microwave Association
It is our great honor to welcome delegates from all over the world to the 45th European Microwave Conference (EuMC) in the city of Paris. This event is Europe’s leading forum for presenting the current status and future trends in the field of microwave, millimeter-wave and terahertz systems and technologies. These high frequency related topics, from materials and technologies to integrated circuits, systems and applications are addressed in all their aspects: theory, simulation, design and measurement. EuMC shares also several sessions both with EuMIC (9 sessions), in the field of Active Devices, Circuits and Subsystems (Microwave Photonic Circuits and Systems, Efficiency Enhancement and Linearization of Power Amplifiers, Low Noise Circuits and Modules conversion and control), and with EuRAD (11 sessions), in the fields of Millimeter wave, THz Technologies and Systems, and Antennas and Propagation (Antenna Systems, Phased Arrays (Active/Passive), Tx/Rx Module Technologies, Ultra Wide Band Technology and Systems).

The EuMC opening session will be held on Tuesday at 10:50h, and the closing session on Thursday at 16:10h. These sessions are common to EuMC and EuMW, and are presented in our EuMW General Chairman Welcome Address. They will include three distinguished key note speakers, and the Award ceremonies, with the EuMC Microwave Prize and the EuMC Young Engineer Prizes.

The EuMC TPC has received 640 submissions; 56% of these contributions have been selected to build a very high quality and dense conference programme, which consists of workshops, short courses (see the Welcome Address from our Workshop Chair for their presentation) – on Sunday, Monday and Wednesday – and of regular, Special and focused sessions – mainly on Tuesday, Wednesday and Thursday.

Each of the 46 oral Regular Sessions allow five speakers to present their recent results. They are given up to eight parallel sessions.

Five Focused Sessions have been selected from proposals of their Chairs. The related solicited papers have been reviewed by the TPC members as regular ones. This year, the selected domains are on ‘Advances in THz and Opto-Nanoelectronics’ (chaired by L. Pierantoni, common with EuMIC), on ‘Advance in Scanning Probe Microwave and mm-wave Microscopy’ (chaired by M. Farina), on ‘Microwave in Agriculture Environment and Earth Observation (MAGEO)’, (chaired by M. Bozzi), and on ‘Modal Analysis of Electromagnetic Structures’ (chaired by G. Kyriacou).

Three Special Sessions and their chairs have been selected based on subjects of specific interest to the microwave community; J. Sombrin has organized one on ‘System modelling and optimization’, M. Tenzeris on ‘Additive Manufacturing Techniques for RF Modules’, and H. Meinel on ‘Autonomous driving in a worldwide changing society – Between silver agers and Y-generation’. From an agreement between EuMA and the organizers of the Asian Pacific Microwave Conference, a Special Session is also devoted to enable the exchange of speakers between the two conferences.

Poster presentations have been organized on Tuesday, Wednesday, and Thursday in the exhibition area, giving the opportunity for people to listen to each other, to discuss, enquire and exchange ideas.

The exhibition runs in parallel with the conference and offers all of us the chance to acquire up-to-date information from companies active in our areas of interest.

We hope you will enjoy the conference!
Welcome to the 10th European Microwave Integrated Circuits Conference, EuMIC 2015

The European Microwave Integrated Circuits Conference is jointly organized by GAAS® Association and EuMA since 2006. This premier European technical conference for RF microelectronics has proven to greatly contribute to the European Microwave Week success. The 10th edition of EuMIC will be held on September 7th and 8th 2015 in Paris.

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.

Technological innovations are challenging for the modeling and simulation as well as for the characterization techniques both on device and circuit levels. While GaAs and silicon-based IC technologies are extensively used in today’s systems, emerging technologies such as wide band gap (SiC, GaN, etc.), CNT, Graphene and heterogeneous 2D crystal based devices are expected to become commercially available within coming decade, with a huge impact on system performance.

To provide short time-to-product, first-pass success in the design becomes therefore critical. Accurate component modeling and efficient CAD/CAE tools are vitally important. Success in these technologies will enable new services in the areas of safety and security, high bitrate wireless access, and multigigabit/s low-cost wireless links. In such a swiftly changing environment, it is essential to be well informed about the latest technological developments.

In the modeling area, topics related to device and system, small and large signal characterization, set-ups and modeling approaches up to THz applications are focused with a particular emphasis. In the technology area, papers on nanotechnologies, nanodevices and nanomaterials for microwaves, as well as wide-bandgap devices and technologies, devices for microwave photonics are proposed. Devices, IC reliability and 3D-interconnects in ICs are also covered.

Finally, in the circuit design and applications topics, RF and microwave IC’s, millimeter and submillimetre-wave IC’s, photonic IC’s, mixed-signal and high speed digital IC’s, tunable and reconfigurable IC’s as well as integrated receivers, transmitters and transceivers are in the spotlight of the conference programme.

The EUMIC Opening plenary session will feature 2 keynote speakers by world leaders in their fields. Andrea Cathelin from STMicroelectronics, Crolles, France, will present the planar UTBB FD-SOI technology for highly energy efficient devices. Thomas Roedle from NXP Semiconductors, Nijmegen, The Netherlands, will focus his talk on GaN Technology, Modelling and Applications.

The Closing session will include the traditional Foundry Session gathering several key representatives of RF and microwave semiconductor foundries, and the speeches given by two eminent plenary key-note speakers. The Closing session features an exciting panel discussion on the Impact of Advanced GaN and Silicon Technologies for Military and Space Applications.

During the Closing ceremony, the best contributed paper to EuMIC 2015 will be awarded by the EuMIC Technical Program Committee and the EuMW Steering Committee. The EuMIC Young Engineer Award will be presented to a young engineer or researcher who authored an outstanding paper presented at the EuMIC Conference and three GAAS® PhD student fellowships will be celebrated.

We look forward to welcoming you personally at the EuMIC, while wishing you an exciting microwave week in Paris in September 2015.

Eric Kerhervé
EuMIC 2015 Chair

Didier Floriot
EuMIC 2015 Co-Chair

Eric Tournier
EuMIC 2015 TPC Chair
Welcome to the 12th European Radar Conference, EuRAD 2015

It is our great pleasure to welcome you to the 12th European Radar conference (EuRAD), to be held in Paris, from September 9th to September 11th. This conference is the major European event addressing the present status and future trends in the field of radar technology, system design, and applications, and covers a wide variety of topics, ranging from radar components and systems, radar echo modeling, advanced signal processing techniques, up to the most innovative radar architectures and concepts and the latest applications.

This year, 190 papers were submitted to the conference, and after a rigorous selection process, the accepted papers were organized into 16 oral sessions and 2 poster sessions. EuRAD delegates will also have the possibility to attend 11 sessions shared with EuMC, related to millimeter-wave and THz technologies and systems, antennas and propagation and ultra wide band technology and systems. Three focused sessions have been proposed by renowned experts on very innovative and interesting fields, dealing with ‘3D SAR Imaging of Complex Environments’, ‘Measurement and Processing Techniques for System Diagnostic and Calibration’ and ‘Advanced Modeling, Processing and Inversion Applied To Ground Penetrating Radar’, and one special session will present some ‘Advances on T/R Modules for AESA applications’.

These sessions are complemented by expert workshops and short courses, presented on Wednesday and Friday, covering advanced radar concepts, techniques and applications:
- Radar Electromagnetic Scattering Modeling from Random Rough Surfaces (Short Course)
- Opening Ways for Exploring New Maritime Radar Applications Using High-Level Modeling (Workshop)
- Geometric Radar Processing Breakthrough Based on Fisher Information Geometry (Short Course)
- MIMO Radar: From Principles to Practical and Useful Applications (Short Course)

The opening session will take place on Wednesday at 10:50h and will include two keynote presentations, given by internationally recognized experts, illustrating current trends in radar and state of the art techniques and concepts. Marc Lesturgie, from ONERA, France, will consider recent and important innovations in his talk on ‘Breakthroughs and new concepts in SAR and radar’, and Fabio Rocca, from Politecnico di Milano, Milano, Italy, will give a presentation on ‘Geosynchronous Synthetic Aperture Radars: systems and applications’, introducing the potential, risks and applications of a multi-sensor geosynchronous spaceborne SAR mission.

During the closing session, to be held on Friday at 13:50h, after a complimentary lunch offered to all EuRAD participants, Albert Huizing, from TNO, The Netherlands, will give a presentation on ‘Radar Horizon 2030: Challenges and Emerging Technologies’ addressing some of the future challenges for radars and presenting the state-of-the-art and new developments in signal processing techniques.

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 EuRAD 2015.

We look forward to meeting you at the EuRAD 2015 conference, and wish you a very pleasant stay in Paris, ‘La Ville Lumière’.

Laurent Ferro-Famil
EuRAD 2015 Chair

Jean-Marc Goutoule
EuRAD 2015 Co-Chair

Michèle Lalande
EuRAD 2015 TPC Chair
Welcome from the General TPC Chair

The European Microwave Week is back in Paris in 2015! Welcome to Paris, the City of Light, which attracts millions of visitors every year to discover its old neighborhoods, its fashion and luxury stores on the famous “Champs Elysées” and of course, the iconic “Tour Eiffel”.

As General TPC Chair I would like to acknowledge the intensive work conducted by the reviewers and TPC members in quite a short period between the deadline submission date and the TPC meeting. The reviews were conducted by more than 500 reviewers and TPC members through 32 subcommittees, leading to a complete and attractive programme, with more than 90 sessions planned during the Week. The TPC meeting held in Paris at the end of March has been quite an intensive period for the conference preparation, considering the high scientific quality of the 990 submitted papers.

I also would like to especially thank the administrators of the TPMS system, Matthias Rudolph, Marc Van Heijningen and Jeff Pond, who have done tremendous work once again this year in setting up the TPMS and who efficiently contribute to the final programme preparation. I encourage all of you to participate in the numerous social and scientific activities organized in parallel with the regular conference programme. Enjoy the “Palais des congrès” convention center, visit the exhibition area. Take advantage of the Workshops which will give you an unique vision of the latest innovations and research results on microwave technologies, components and systems.

Serving as General TPC Chair of EuMW 2015 has been a great honour and valuable experience from my side, through the numerous interactions we have had with the local team in order to prepare this edition, and also through the close cooperation with Horizon House. I would also like to thank the active and efficient support of the EuMA Board to consolidate the programme, and especially Prof Dr.-Ing Wolfgang Heinrich President of the European Microwave Association, for his continued encouragement and valuable advice.

Enjoy the programme, I wish you fruitful scientific discussions during the week and hope you find time to enjoy the City of Light.

Christian Person
2015 General TPC Chair

International Journal of Microwave and Wireless Technologies: EuMW 2015 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 six 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 the European Microwave Week 2015.

The authors of a number of 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 Denis Barataud, TPC chair of EuMC 2015, Eric Tournier, TPC chair of EuMIC 2015, and Michèle Lalande, TPC chair of EuRAD 2015.

Accepted papers will be published online at http://journals.cambridge.org/MRF within six weeks of acceptance and can be referenced using their DOI (Digital Object Identifier). Once all submissions are received the articles will be collated into an issue and published in print, which is expected to appear in June 2016.
The European Microwave Week 2015
Local Organising Committee
EuMC Microwave Prize

A novel programmable harmonic selection technique based on the pseudo-locking of an oscillator by periodically repeated oscillations train.

Clement Jany¹, Alexandre Siligaris¹, Philippe Ferrari², Pierre Vincent¹

¹CEA-Leti, Grenoble, France
²Université de Grenoble-Alpes, CNRS, IMEP-LAHC, Grenoble, France

EuMC Young Engineer Prize

Quasi-Lumped Coplanar Transmission-Line Sensors for Broadband Liquid Characterization.

Nora Meyne, Wiebke Müller-Wichards, Hoc Khiem Trieu, Arne F. Jacob

Technische Universität Hamburg-Harburg, Hamburg, Germany

EuRAD – Best Paper

P-Band Polarimetric SAR Tomography for Tropical Forest Structure Characterization.

Bassam El Hajj Chehade, Laurent Ferro-Famil

University of Rennes, Rennes, France

EuRAD Young Engineer Prize

A Simple Approach to Through Wall Localization of Persons Moving in 3-Dimensional Space.

Peter Kažimír¹, Dušan Kocur¹, Jana Fortes¹, Daniel Novák¹, Rudolf Zetík²

¹Technical University of Kosice, Kosice, Slovak Republic
²Ilmenau University of Technology, Ilmenau, Germany

EuMIC Best Paper

20 nm Metamorphic HEMT Technology for Terahertz Monolithic Integrated Circuits.

Arnulf Leuther, Axel Tessmann, Patrick Doria, Matthias Ohlrogge, Matthias Seelmann-Eggebert, Hermann Maßler, Michael Schlechtweg, Oliver Ambacher

Fraunhofer IAF, Freiburg, Germany

EuMIC Young Engineer Prize

A 2.4 GHz Fast Switchable LNA With Transformer Matching For Wireless Wake-Up Receivers.

Christoph Tzschoppe, Robert Kostack, Jens Wagner, Robert Paulo, Frank Ellinger

Technical University of Dresden, Dresden, Germany

This was the only no-show during the EuMW award ceremonies. The certificate and the EuMA letter indicating the procedure to get the prize were shipped a few days after the EuMW. Authors confirmed they received the material.
2015 EuMA Outstanding Career Award

Jacques Sombrin got his engineering degrees from the Ecole Polytechnique Paris - France in 1969 and the Ecole Nationale Supérieure des Télécommunications Paris-France in 1974. He is a Senior Member of the IEEE, member of EuMA, and an IEEE member (MTT, EDS, IT and COM).

He has been with the French National Agency for Space Studies (CNES) since the beginning of his career in 1974. He worked in CNES successively as a design engineer from 1974 to 1983 and as the head of the microwave department from 1983 to 1998. He was responsible for microwave space equipment R&D and support to a number of major space projects in France and Europe including SPOT (Earth observation), STENTOR & TDF (telecommunications), GALILEO (navigation) & POSEIDON (altimetry of sea level).

As the head of the Transmission and Location division in CNES from 1998 to 2003 he has been responsible for antennas, signal processing, telemetry, command and ranging, telecommunications, radar, and satellite navigation. From 2003 to 2010 he was the Assistant Director for Radio Frequencies of the CNES and managed the R&D activities in CNES. Since 2010 he has been retired from CNES and keeps up his research as the holder of the “Integrated and Secure Systems” chair at Limoges University and in the TeSA laboratory in Toulouse. He is also active in higher education and teaches some courses in the ENSEEIHT engineering school in Toulouse.

Jacques Sombrin has published more than 100 papers and holds 17 patents. Beyond that, he has demonstrated an extraordinary capability to bring new concepts and ideas in various domains such as the modelling and optimization of power amplifiers for space – Carrier to Noise plus Intermodulation ratio (C/((N+I))) as the optimization criterion, the analysis of complex high power physical phenomena such as corona, and multifactor effects leading to RF breakdown of microwave devices, the optimization of global transmission systems for space, including energy consumption, antenna architectures, coding and modulation schemes, multiplexers design, amplifiers optimization and, more recently, passive intermodulation modelling. This technological and scientific eclecticism provided him with an outstanding recognition among the microwave community (both industrial and academic) in France and in Europe. Moreover, he has constantly promoted research in microwaves in France by bringing the support of CNES to the academic and industry microwave community to prepare the techniques and technologies for future applications.

2015 EuMA Distinguished Service Award

Jozef Modelski received his M.Sc.(’73), Ph.D.(’78), and D.Sc.(’87)-habilitation degrees in electronics from the Warsaw University of Technology (WUT), where he is Professor and Director of the Institute of Radioelectronics. He obtained the state title of Professor in 1994. He also received titles of doctor honorsis causa from the Military University of Technology in Warsaw (2011) and Lodz University of Technology (2014), where he is IEEE Fellow. He has been a member of the Polish Academy of Sciences (Chair of the Electronics and Telecommunications Committee) since 2007 and President of the URSI National Committee since 2011.

His research interests include the areas of microwave phase modulators and shifters with semiconductor diodes, dielectric resonators and their applications, integrated waveguide technology INWATE, and recently reconfigurable semiconductor antennas as well as tunable ferroelectric antennas. He has published over 300 technical papers, 4 monographs, obtained 9 patents and was supervisor of 25 Ph.D. dissertations. He received many technical and scientific awards, among those the EuMA Award for the best paper of the European Microwave Conference 2008, few awards from the Ministry of Science and Higher Education (Poland) as well as from the Polish Academy of Sciences.

Throughout his career, Prof. Modelski has strongly supported international collaboration in science. As a scientist he spent in 1976/77 over a year in the US as a Fulbright grantee working with the microwave laboratories at the University of Texas at Austin, Cornell University and COMSAT Laboratories. In 1986 he joined the Braunschweig Technical University (Germany) as a senior scientist for a period of 2 years.

His active service to the microwave community includes first of all support of the regional and local microwave communities in Europe. He played a leading role in transforming a number of local national conferences in Europe into international events, for example the International Conference on Microwaves, Radar and Wireless Communications MIKON and Microwave and Radar Week, which has grown into one of the most important microwave events in Central and Eastern Europe. He has also been a member of the IEEE Microwave Theory and Techniques Society Administrative Committee since 1994, including a term as President in 2008. In the years 1993-2001 he was a key member of the IEEE Divisions IV Joint Committee for Membership Promotion and Chapter Formation in Eastern Europe, which led to the consolidation of IEEE communities in this area. In the years 2009-2010 he served as IEEE Region 8 Director and in 2013-2014 Division IV Director. He was one of the first members of EuMA (membership 008); for many years he participated in the European Microwave Week Steering Committee and EuMA General Assembly, Awards Committee as well as serving as a member of the EuMC TPC.
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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

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(as of 03/2015)

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Welcome to EuMW 2015

EuMW 2015 will be held in the vibrant and exciting city of Paris. Bringing industry and academia together, European Microwave Week 2015 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 2015 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 18th 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. Choose from three separate but complementary conferences. Spanning the length of the week, starting from Sunday 6th September, the conferences and workshops are scheduled as follows:

• European Microwave Integrated Circuits Conference (EuMIC) 7th – 8th September 2015
• European Microwave Conference (EuMC) 7th – 10th September 2015
• European Radar Conference (EuRAD) 9th – 11th September 2015
• Plus Workshops and Short Courses
• In addition EuMW 2015 will include the ‘Defence, Security and Space Forum’

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

CONFERENCE REGISTRATION & LOCATION
Online registration opens on 25th May 2015 and remains open up to and during the event until 11th September 2015. During the event, you can also register Onsite from Saturday 5th September 2015 (16:00h -19:00h) and from 07:30h each morning from Sunday 6th September 2015 to Friday 11th September 2015.

The conferences will be held in different rooms over the conference dates. Please refer to the Conference Sessions Matrix pages at the end of this programme for a detailed overview. Delegates should 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 programme.

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, you can collect the conference proceedings which are on a USB stick and delegate bag for the conferences. 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 on the first floor of the Palais des Congrès 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 either 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@itnint.com

VAT
All EuMW registration fees listed in the Programme Book and on the website include 20% French VAT. According to legal requirements, all attendees will be charged VAT, with the exception of persons or entities VAT registered in France. For details on this and the question whether and how VAT can be recovered please see the EuMW website at www.eumweek.com/conferences/vat.html

EXHIBITION HOURS
The exhibition area will be located on Level 1 as shown on the Floor Plans at the end of this programme. As a registered delegate you will have full access to the exhibition area.

The exhibition opening hours are:
Tuesday 8th September: 09:30h – 18:00h (followed by the Welcome Reception)
Wednesday 9th September: 09:30h – 17:30h
Thursday 10th September: 09:30h – 16:30h
See the back cover for a full listing of the exhibitors (correct at the time of going to press).

CYBERCAFÉS AND WIFI
The two cyber cafés, sponsored by CST, are located in Hall Neuilly and Hall Paris. Wifi is available in the conference area on level 2.
SPEAKER PREPARATION SPACE
A speaker preparation area is located in room 204, level 2 Paris side.

PROCEEDINGS ON USB
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 sponsored by UMS, combining all three conferences.

EuMA KNOWLEDGE CENTRE
The EuMA website has its Knowledge Centre which presently contains 18,000 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.

EuMA ARCHIVAL DVDS
Both 1969-2003 and 2004-2008 DVDs are available until end of stock for free at the EuMA desk.

EuMA MEMBERSHIP
Membership applications received after August 1, or through the EuMW registration form are intended for the next calendar year.

EuMA membership fee is €25 for Professionals and €15 for Students.

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

EuMA INTERNATIONAL JOURNAL
The ‘International Journal of Microwave and Wireless Technologies’ is published annually with 6 issues. EuMA members are entitled to free electronic access to the Journal. There is a special offer when subscribing to both Membership and Journal: €67 for Professionals, €57 for Students.

GETTING TO THE PALAIS DES CONGRÈS
Paris can easily be reached by plane, train or car, as it is located crossroad of Europe. It is served by two international airports and a very convenient railway system. The shuttle buses from Charles de Gaulle or Orly airports arrive downtown.

• Arriving by plane
Paris has two international airports. Most international flights use the larger Roissy Charles de Gaulle Airport (airport code CDG), 30 km north-east of Paris. The other one is the Orly Airport (airport code ORY), 18 km south of the city. Most international airlines have direct connections to Paris from their respective hubs. Roissy Charles de Gaulle Airport and Orly Airport are both well connected by public transport to central Paris.

From Roissy-Charles de Gaulle Airport:

RER B, stop at “Chatelet Les Halles”
then take RER A to “Charles de Gaulle/Etoile”
then line 1 of the metro to “Porte Maillot/Palais des Congrès”

By Air France or ADP shuttle bus: take line 2 (buses go directly to “Porte Maillot/Palais des Congrès” or to the “Opéra” in the city centre). Departure every 15 minutes from 05:45h to 23:00h. Approximate travel time: 1 hour.

From Orly Airport (approximate travel time: 60 minutes):
High speed shuttle (Orlyval) to “Antony”
RER B, stop at “Chatelet Les Halles”
then take RER A to “Charles de Gaulle/Etoile”
then line 1 of the metro to “Porte Maillot/Palais des Congrès”

By the “Cars Air France”: go to “Terminus Etoile”, then line 1 of the metro to “Porte Maillot/Palais des Congrès” Departure every 30 minutes from 06:00h to 23:00h. Approximate travel time: 40 minutes to 1 hour. By taxi: approximate travel time to central Paris is 40 minutes to 1 hour depending on traffic.

• Arriving by car
To Reach “Porte Maillot”, you need to drive on the inner/outer ring road and you should exit at “Boulevard Peripherique Ouest” (west beltway). Direct access to the underground parking of the Palais des Congrès via Porte Maillot. Open 24 hours a day.

• Arriving by train
Line C of the RER Commuter train provides direct access to the “Porte Maillot” station. Public transportation

• Metro
The metro is probably the best way to travel within the city. The Palais des Congrès is above the “Porte Maillot” metro station. It runs from 05:30h to 01:00h. You should keep your ticket until you leave the metro as you may need to show it /have it with you at some exit doors and in case of controls. Line 1 of the metro (La Défense-Château de Vincennes) crosses the city from east to west and provides direct access to the Palais des Congrès “Porte Maillot” station.

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• Bus
They are slower than the metro at certain hours of the day depending on traffic, but the bus services are frequent during the day even if more irregular after 20:00h on some lines. Lines to “Porte Maillot”: 82 (Luxembourg-Neuilly), 73 (Concorde-La Défense), and PC1, PC2, PC3 (beltway lines).

• Public transport tickets
Paris public transport is operated by the RATP and includes the metro subway system, RER trains, buses, night buses, Montmartre bus, and the Montmartre funicular railway, all of which accept the same tickets and passes.

You can purchase individual tickets, or a Paris Visite Metro Pass, available for 2, 3 or 5 consecutive days of unlimited travelling: these tickets were created especially for visitors, they also include special offers and discounts of up to 35% at a variety of attractions in the Paris area. This makes travelling around the city very easy. Tickets for public transport are available at subway stations, some bus terminals and registered retailers, usually tobacconists and bookshops, displaying the RATP sign.

• Taxis
There are approximately 500 taxi stations on the city’s major avenues and boulevards. There is an initial fee for each ride. The average fare from downtown to the Palais des Congrès is €15.00. For your ride back, there is a taxi station located on the Avenue de la Grande Armée, right next to the Palais des Congrès: +33 (0)1 45 72 61 84.

The Airports’ specialist is: +33 (0)6 08 57 75 83 available 24 hours and 7/7 days (major credit cards accepted).

Useful telephone numbers
Paris airports (Roissy CDG and Orly): 3950
Air France: 3654
SNCF (French National Railways): 3635
Taxi services:
   Taxis G7: +33 (0)1 47 39 47 39
   Taxis Bleus: +33 (0)1 49 36 10 10
Emergency: 15 or 112

PERSONAL INVITATION
The organisers will be pleased to send you a link to request a letter of invitation when you register as a conference delegate, speaker or exhibitor. In the case of delegates, it is understood that such an invitation letter is intended to help potential delegates in raising funds or obtaining a visa. The letter of invitation is therefore not a commitment on the part of the conference organisers to provide any financial support and the conference fees will not be waived.

POSTER SESSIONS
Poster sessions will take place in Hall Maillot on Monday and in Hall Ternes, Level 1 on Tuesday, Wednesday and Thursday. Please check the CONFERENCE SESSIONS MATRIX pages at the end of this programme for full details.

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 2015.

ELECTRICITY
Electricity is supplied at 220V, 50Hz. Type E French CEE 7/5 socket.

SOCIAL EVENTS & PARTNER PROGRAMME
Full details of the social events & dinners that are taking place during EuMW 2015 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.

HOTEL RESERVATION
Horizon House has teamed up with Connex Hotels and Events, our preferred hotel booking supplier, to offer you the ability to book your accommodation for this exhibition at the most competitive rates available. It is very easy to make an immediate hotel booking. Simply visit their booking page http://www.connexhotelsandevents.com/eumw-2015-paris.html and make your booking, or email sally@connexhotelsandevents.com. You will find a wide range of accommodation to suit every budget. Alternatively, see the hotel booking pages within this programme.

SHOPPING & SIGHTSEEING
From museums to restaurants, Paris has so much to offer visitors. Some of the most famous Parisian landmarks include Notre Dame de Paris, the Arc de Triomphe and the Eiffel Tower. Other sites include the Tuileries Gardens, the Champs-Élysées, the Invalides museum, the Panthéon church, the Palais Garnier, the Sainte-Chapelle palace chapel and the Église de la Madeleine.

The Louvre is one of the most famous museums featuring the Mona Lisa and the Venus de Milo statue. Other museums include Musée Picasso, Musée Rodin, Musée du Montparnasse, Musée National d’Art Moderne, Musée Cluny, Musée d’Orsay and the Musée du quai Branly.

Paris has many theatres and opera houses. Two of the largest opera houses include Opéra Garnier and the Opéra Bastille. Theatres include Bobino, Théâtre Mogador and the Théâtre de la Gaîté-Montparnasse.

For shopping, few places in the world can beat the size and range of shops along the boulevard Haussmann. Other good shopping areas include the rue de Rivoli, on the Left Bank and the Madeleine.

For information on just a sample of the city’s sites, visit http://en.parisinfo.com/

Also see the Social Events & Partner Programme section of this programme for tours and excursions before, during and after EuMW 2015.
### 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 AT 20%**.

**ONLINE** registration is open from 25th May 2015 up to and during the event until 11th September 2015.

**ONSITE** registration is open from 16:00h on 5th September 2015.

**ADVANCE DISCOUNTED RATE** (up to and including 6th August) **STANDARD RATE** (from 7th August & Onsite)

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**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 6th August (these are 40% cheaper than the Standard Rate)
- **STANDARD RATE** – for all registrations made online from 7th August and onsite.

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

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**CONFERENCE REGISTRATION DETAILS**

**Online Registration**

- All registrations should be made online at www.eumweek.com. Those completed up to and including 6th August will be charged at the 'Advance Discounted Rate' and those from 7th August will be charged at the 'Standard Rate'.
- Online registration is open from 25th May 2015 up to and during the event until 11th September 2015. You can also register ONSITE from 16:00h on Saturday 5th September 2015 and then at the times detailed below.

**Onsite Registration**

- Onsite registration is available:
  - **Saturday 5th September** 16:00h – 19:00h
  - **Sunday 6th September** 07:30h – 17:00h
  - **Monday 7th September** 07:30h – 17:00h
  - **Tuesday 8th September** 07:30h – 17:00h
  - **Wednesday 9th September** 07:30h – 17:00h
  - **Thursday 10th September** 07:30h – 17:00h
  - **Friday 11th September** 07:30h – 10:00h

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

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**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.
- All those registering will be emailed an invoice with the respective VAT information.
- Entities/attendees in possession of a French VAT number please contact eumwreg@itnint.com and provide this number.
- For more detailed explanations on VAT please visit www.eumweek.com/conferences/vat.html
- 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 on the right as you enter from the escalator, on Level 1.
- 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@itnint.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 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 AND WELCOME RECEPTION**

- All delegates must present their badges to be scanned to receive coffee during the coffee breaks. There will be two coffee breaks per day and coffee will only be given to those who have their badges for scanning.
- On Tuesday, Wednesday & Thursday coffee breaks will take place within the exhibition area on Level 1 in three locations as sign posted.
- On Sunday, Monday & Friday, they will take place on Level 2. Please note there is only one coffee break Friday morning.
- All delegates must bring their badges with them to the Welcome Reception, which takes place in Espace Maillot, Level 2 after show close at 18:30 hrs on Tuesday 8th September. Badges will be scanned to allow entrance and those without a badge will be refused entry.

**THE EUMW CRUISE ON THE RIVER SEINE**

Don’t miss out on this delightful cruise that is sure to leave you with cherished memories of your time at the Paris Week. Beginning at the Pont de l’Alma at 20:00 hours, you’ll see many of Paris’ most exciting sites and monuments. This unique sightseeing experience will be complimented with a cocktail reception of champagne and canapés. Don’t miss this unforgettable experience! Tickets are limited, so register today!

**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 any access to other conference sessions.
Reduced rates are offered if you have society membership to any of the following*: EuMA, GAAS, IET or IEEE. EuMA membership fees: Professional €25/year, Student €15/year. If you register for membership through the EuMW registration system, you will automatically be entitled to discounted member rates. 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 11th September 2015).

ADVANCE DISCOUNTED RATE (up to and including 6th August) STANDARD RATE (from 7th August & Onsite)

<table>
<thead>
<tr>
<th>CONFERENCE FEES</th>
<th>STANDARD RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Conference</td>
<td></td>
</tr>
<tr>
<td>EuMC</td>
<td>€ 470</td>
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<tr>
<td>EuMIC</td>
<td>€ 360</td>
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<td>EuRAD</td>
<td>€ 320</td>
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<td>2 Conferences</td>
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<td>EuMC + EuMIC</td>
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<td>EuMC + EuRAD</td>
<td>€ 640</td>
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<td>EuMIC + EuRAD</td>
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<td>3 Conferences</td>
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<td>EuMC + EuMIC + EuRAD</td>
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STANDARD CONFERENCE FEES (FROM 7TH AUG. AND ONSITE)

<table>
<thead>
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<tbody>
<tr>
<td>1 Conference</td>
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<tr>
<td>EuMC</td>
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<tr>
<td>EuMIC</td>
<td>€ 510</td>
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<td>EuRAD</td>
<td>€ 450</td>
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<td>2 Conferences</td>
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<td>EuMC + EuMIC</td>
<td>€ 940</td>
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<tr>
<td>EuMC + EuRAD</td>
<td>€ 890</td>
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<td>EuMIC + EuRAD</td>
<td>€ 770</td>
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<td>3 Conferences</td>
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<td>EuMC + EuMIC + EuRAD</td>
<td>€ 1140</td>
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WORKSHOP AND SHORT COURSE FEES (ONE STANDARD RATE THROUGHOUT)

<table>
<thead>
<tr>
<th>FEES</th>
<th>STANDARD RATE</th>
</tr>
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<tbody>
<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>

DVD Archive EuMC

DVD Archive EuMC 1969-2003 FREE - Until end of stock
DVD Archive EuMC 2004-2008 FREE - Until end of stock

Partner Programme and Social Events

Full Details and contacts for the Partner Programme and other Social Events can be obtained via the EuMW website www.eumweek.com

SPECIAL FORUMS & SESSIONS

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Title</th>
<th>Location</th>
<th>No. of Days</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday 9th September</td>
<td>10:50h - 18:45h</td>
<td>Defence, Security &amp; Space Forum</td>
<td>Room Maillot</td>
<td>1</td>
<td>€ 10 for delegates (those registered for EuMC, EuMIC or EuRAD)</td>
</tr>
</tbody>
</table>
# EUROPEAN MICROWAVE WEEK WORKSHOPS AND SHORT COURSES

## SUNDAY 6th September

<table>
<thead>
<tr>
<th>Type</th>
<th>Day</th>
<th>Code</th>
<th>Code Type</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>Full Day</td>
<td></td>
<td>WS01</td>
<td>EuMC</td>
<td>Sensors Towards Terahertz: Novel Technologies for Potential “THz Killer Applications” in Life Sciences and Spectroscopy</td>
</tr>
<tr>
<td>Half Day</td>
<td></td>
<td>WS02</td>
<td>EuMC</td>
<td>100 Gbit/s Wireless Communications at High mm-Wave Frequencies</td>
</tr>
<tr>
<td>Half Day</td>
<td></td>
<td>WS03</td>
<td>EuMC</td>
<td>Technologies Overview for mm-wave Tunable Circuits</td>
</tr>
<tr>
<td>Half Day</td>
<td></td>
<td>WS04</td>
<td>EuMC</td>
<td>Latest Developments in GaN PA Technologies and Techniques</td>
</tr>
<tr>
<td>Half Day</td>
<td></td>
<td>WS05</td>
<td>EuMIC</td>
<td>GaN Technology for Space Applications</td>
</tr>
<tr>
<td>Full Day</td>
<td></td>
<td>WS06</td>
<td>EuMC</td>
<td>Recent Advances on High Performance Reconfigurable Filters</td>
</tr>
<tr>
<td>Half Day</td>
<td></td>
<td>WS07</td>
<td>EuMIC</td>
<td>RF-Technologies on the Move: The Races of Integrated mm-Wave Automotive Radar and Sensing Technologies</td>
</tr>
<tr>
<td>Half Day</td>
<td></td>
<td>WS08</td>
<td>EuMC</td>
<td>Microwave Characterization of Nanoscale devices</td>
</tr>
<tr>
<td>Half Day</td>
<td></td>
<td>WS09</td>
<td>EuMC</td>
<td>Microwave Measurements and Electromagnetic Simulations of Printed Circuit Boards (PCBs) for High-Speed Digital and Radio Frequency (RF) Applications</td>
</tr>
<tr>
<td>Half Day</td>
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<td>WS10</td>
<td>EuMC</td>
<td>Transceiver/IF Structures and Modelling for Wideband and SDR Systems</td>
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<tr>
<td>Full Day</td>
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<td>WS11</td>
<td>EuMC</td>
<td>Far-field Wireless Power Transmission</td>
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<tr>
<td>Full Day</td>
<td></td>
<td>WS12</td>
<td>EuMIC</td>
<td>SiGe for mm-Wave and THz</td>
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<tr>
<td>Full Day</td>
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<td>SC01</td>
<td>EuMC</td>
<td>Nonlinear Microwave Circuit Design: The Basics of Computer Aided Nonlinear Microwave Circuit Design</td>
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<tr>
<td>Half Day</td>
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<td>SC02</td>
<td>EuMC</td>
<td>Fundamentals of Microwave Power Amplifier Designs</td>
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<tr>
<td>Half Day</td>
<td></td>
<td>SC03</td>
<td>EuMC</td>
<td>Design by Mathematics of Full Software Radio Circuits and Systems: Methodology and Application to 5G Standard</td>
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## MONDAY 7th September

<table>
<thead>
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<th>Day</th>
<th>Code</th>
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<tr>
<td>Full Day</td>
<td></td>
<td>WM01</td>
<td>EuMC</td>
<td>Fundamentals and Engineering Considerations of Terahertz Technologies: from Devices to Applications</td>
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<tr>
<td>Half Day</td>
<td></td>
<td>WM03</td>
<td>EuMC</td>
<td>Bio-ElectroMagnetism for Biological and Medical Applications: Latest Developments on Implantable Micro-Devices, Sensing Concept and Modelling Approaches</td>
</tr>
<tr>
<td>Full Day</td>
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<td>WM04</td>
<td>EuMC</td>
<td>Millimeter-wave Multilayer MCM/SoP and Heterogeneous Integration Techniques</td>
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<tr>
<td>Full Day</td>
<td></td>
<td>WM05</td>
<td>EuMC</td>
<td>Millimeter-Wave Technologies for 5G Mobile Networks</td>
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<tr>
<td>Half Day</td>
<td></td>
<td>WM06</td>
<td>EuMC</td>
<td>Recent Advances in the Synthesis of Microwave Filters and Multiplexers</td>
</tr>
<tr>
<td>Half Day</td>
<td></td>
<td>WM07</td>
<td>EuMC</td>
<td>Recent Advances in RF/microwave filters for Space Application</td>
</tr>
<tr>
<td>Full Day</td>
<td></td>
<td>WM08</td>
<td>EuMC</td>
<td>Current and Future Use of Spectrum by PMSE</td>
</tr>
<tr>
<td>Full Day</td>
<td></td>
<td>SCM01</td>
<td>EuMC</td>
<td>High RF Power Critical Effects</td>
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## Wednesday 9th September

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<tr>
<th>Type</th>
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<tbody>
<tr>
<td>Half Day</td>
<td></td>
<td>WW01</td>
<td>EuRAD</td>
<td>Opening Ways for Exploring New Maritime Radar Applications Using High-Level Modelling</td>
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<tr>
<td>Half Day</td>
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<td>SCW01</td>
<td>EuRAD</td>
<td>Geometric Radar Processing Breakthrough Based on Fisher Information Geometry</td>
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<tr>
<td>Half Day</td>
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<td>SCW02</td>
<td>EuMC</td>
<td>Multibeam Antennas and Beamforming Networks</td>
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<tr>
<td>Half Day</td>
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<td>SCW03</td>
<td>EuRAD</td>
<td>Radar Electromagnetic Scattering Modelling From Random Rough Surfaces</td>
</tr>
</tbody>
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## Friday 11th September

<table>
<thead>
<tr>
<th>Type</th>
<th>Day</th>
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<tbody>
<tr>
<td>Half Day</td>
<td></td>
<td>SCF01</td>
<td>EuRAD</td>
<td>MIMO Radar: From Principles to Practical and Useful Applications</td>
</tr>
</tbody>
</table>
Maintained interest in the subject and the enthusiastic way that the EuMW Defence, Security and Space Forum has been embraced since its inception in 2010 has prompted the joint organisers, the European Microwave Association (EuMA) and Microwave Journal, to continue EuMW’s coverage of the defence, security and space sector. Each year the Forum focuses on a specific area where there is particular interest and activity. In 2015 the emphasis will be on RF systems and technology for Unmanned Aerial Vehicles (UAVs), covering specifics such as: Synthetic Aperture Radar (SAR) for UAVs, ESM and EW for UAVs, operational use of integrated RF systems for UAVs, along with Airborne SARs.

The 2015 EuMW Defence, Security and Space Forum will feature executives from industry, academia, the military and from space agencies. It will be held in combination with the opening of EuRAD and will conclude with a round-table discussion.

Programme

10:50h - 12:30h  EuRAD Opening Session

12:40h - 13:40h  Strategy Analytics Lunch & Learn Session
This session will add a further dimension by offering a market analysis perspective, illustrating the status, development and potential of the market.

13:50h - 15:30h  Microwave Journal Industry Panel Session
The session offers an industrial perspective on the key issues facing the defence, security and space sector. In accordance with the theme for 2015, the Panel will address: RF and Microwave Development for UAVs.

16:10h - 17:50h  EuMW Defence & Security Executive Forum
Speakers from leading European defence industries have confirmed their participation. These high-level speakers will present their view on RF microwave technology trends for the next generation UAV platforms and systems. The industrial speakers are complemented by speakers from government, agencies and research organizations who will offer their perspective of military/security needs, programmes, budgets and scientific research for next generation systems.

18:00h - 18:45h  Cocktail Reception
The opportunity to network and discuss the issues raised throughout the Forum in an informal setting.

Registration and Programme Updates
Registration fees are €10 for those who have registered for a conference and €50 for those not registered for a conference. Register online at www.eumweek.com

As information is formalized, the Conference Special Events section of the EuMW website will give further details and will be updated on a regular basis.
**EuMW 2015 Student Challenge**

**Date:** Tuesday 8th - Thursday 10th September 2015  
**Organisers:** Anne-Laure Franc, University of Toulouse, Audrey Martin, University of Limoges.

The Student Challenge has become a fine tradition at the European Microwave Week and is offered in 2015 for the eighth time. The Student Challenge is an opportunity for 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 challenging field of microwaves. The aim is to promote innovative thinking, teamwork and pro-active behavior; skills future employers will highly value. For the EuMW 2015 Student Challenge, several teams shall be formed; each team has to be composed of a maximum of four members, preferably from different institutions and with a variety of backgrounds. The aim for all teams is to present, explain, and defend a fresh, visionary, application-oriented concept by a poster. The poster must be based on at least two papers presented at the EuMW 2015, of which only one paper may be authored by a member of the team. Eventually, each team will give a five-minute presentation of the innovative concepts they have devised. A technical jury, composed of prominent members of academia and industry, will evaluate the presentation and the poster of each team according to the following criteria: Originality, content, feasibility, and clarity. The winning team will receive the EuMW 2015 Student Challenge Prize worth 1,500 EUR. The sponsoring of this Prize by Thales Nederland B.V. is greatly appreciated. All Bachelor, Master, and Doctoral students registered in any one of the EuMW 2015 Conferences are eligible for participation in the Student Challenge. Updated information and further details can be found at http://www.eumweek.com/student_challenge.html

**Registration**

To register, please send an e-mail to anne-laure.franc@laplace.univ-tlse.fr and audrey.martin@xlim.fr and attach a copy of your student identity card or a confirmation, signed by your responsible professor. The deadline for registration is August 31, 2015.

**Programme**

**Tuesday 8th September 2015**  
08:00h - 12:00h  Student Design Competition.  
12:00h - 13:00h  Poster submission deadline (Hall Passy D)

**Thursday 10th September 2015**  
08:00h  Award ceremony during the EuMW/EuMC Closing Session (Room Maillot)

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**EuMW 2015 Student Design Competition**

**Date:** Tuesday 8th September 2015  
**Organisers:** Etienne Perret, Grenoble INP, France and Arnaud Vena, University of Montpellier, France  
**Location:** Hall Passy

The European Microwave Week will be hosting, for the third time, a Student Design Competition. The main objective of this event is to encourage students to become involved in the dynamic profession of microwave engineering and to apply their knowledge to practical design use. Competitors are required to design, construct, and measure hardware solutions for predetermined design requirements. They will be given the opportunity to challenge themselves and other participating students for the best solution. This year, a single theme is proposed in which cross-knowledge is necessary to perform the required design specifications. The idea is to study and build a single band radio transmitter at the ISM Band of 5.8 GHz for remote empowering. The competition will take place during the conference week, in a special event on Tuesday 8th September 2015. Required test equipment for the evaluation measurements will be provided by Keysight Technologies to the participants. The winner, as judged by the technical committee (based on the figure of merit published on the website of the conference), will be recognized during the EuMW/EuMC Closing Session and will receive the EuMW 2015 Student Design Prize with a value of €1500 sponsored by Cobham. In addition, the winners will be given the opportunity to submit an article to the EuMA International Journal of Microwave and Wireless Technologies in order to share their design techniques and experience with the microwave community. All doctoral, master students registered in any one of the EuMW 2015 conferences are welcome to participate. The students must attend the conference to present their design for evaluation.

**Registration**

To register, please send an e-mail to Etienne Perret (etienne.perret@lcis.grenoble-inp.fr), and attach a copy of your student identity card or a confirmation, signed by your responsible professor. The deadline for registration is August 30, 2015.

**Programme**

**Tuesday 8th September 2015**

08:00h - 12:00h  Student Design Competition.  
12:00h - 13:00h  Poster presentation to jury and audience (Exhibition Hall)

**Thursday 10th September 2015**

17:40h - 18:10h Award ceremony during the EuMW/EuMC Closing Session (Room Maillot)
EuMW 2015 Career Platform

EuMW 2015 continues the “career platform” initiative launched in 2013 in Nuremberg, to foster the dynamic between young researchers, engineers and the job market in the field of microwaves. A dedicated area will be reserved to foster sharing and exchange. Special sessions will also be organized on the industrial market analysis and its career development and recruitment strategies. EuMW 2015 will also launch a unique e-Platform initiative with the ambition to offer to the RF and Microwave community a job portal at the European scale.

For further information, contact the Career Platform Chair:
Dr. Jean-Luc Polleux
Université Paris-Est, ESYCOM, ESIEE Paris
Email: jean-luc.polleux@esiee.fr

Special session 1:
The European Microwave Industry Market
Date: Tuesday 8th September 2015
Time: 08:30h - 12:00h
Room: 202/203, Level 2
Registration: Free

Career Platform’ Meeting Space:
Date: From Monday 7th to Friday 11th 2015
Time: 08:30h -17:00h
Registration: Free
This space will foster the exchange between jobs seekers and jobs offers. It will provide a suitable environment in a warm and friendly environment to share job offers and organize self-organized meeting and job dating. With a focus on SMEs, it is also widely opened to large companies and academics. The platform includes:
• Partner’s booths and banners
• Pinning boards for job offers
• Cozy sharing/meeting space

Special session 2:
Career Development and Recruitment Strategies for the Microwave Industry
Date: Thursday 10th September 2015
Time: 16:10h - 17:50h
Room: 253, Level 2
Registration: Free

E-Career Platform:
Date: From Monday 7th to Friday 11th 2015
Time: 08:30h - 17:00h
Registration: Free
Located in the same area as the meeting spaces, computers will be made available to connect to the e-platform. This EUMW 2015 e-career platform initiative has the ambition to support and promote to the RF and Microwave community a job portal on a European scale. Above mentioned special sessions will also discuss the initiative in order to open it to the community for continued development.
SOCIAL EVENTS

EuMIC Get-Together
Date: Monday 7th September 2015
Duration: 18:30h until 19:30h
Cost: Free to EuMIC delegates
Location: Palais des Congrès (details will be provided during the Conference)

All registered EuMIC 2015 delegates are invited to a jovial get together with friends and colleagues. Recover from the first conference day, talk to the speakers and other experts, or enjoy drinks and finger food from a flying buffet.

Welcome Reception
Date: Tuesday 8th September 2015
Duration: 18:30h until 22:00h
Cost: Free to conference delegates & invited exhibitors
Location: Espace Maillot, Level 2, Palais des Congres

All registered conference delegates, as well as invited representatives from companies participating in the exhibition are invited to the EuMW 2015 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 18:30h followed by the General Chairs’ handover from EuMW 2015, Paris to EuMW 2016, London as well as an address from the Platinum Sponsor, Keysight Technologies. The open-buffet dinner will be served from 19:00h.

THE EuMW Cruise on the River Seine
Date: Wednesday 9th September 2015
Duration: 20:00h until 22:30h
Cost: € 40
Location: Bateaux-Mouches – Port de la Conférence – Pont de l’Alma, Rive droite – Paris 8ème

Please note that places are limited and assigned on a first-come-first-served basis. This boat trip will be the opportunity to discover the most important and prestigious monuments of the Capital on a mythical river “la Seine”. This unique sightseeing experience will be complimented with a cocktail reception of champagne and canapés.

From “Palais des Congrès”, take the RER C – Neuilly-Porte Maillot Station to Pont de l’Alma Station, cross the bridge and you will reach the boarding fo “Bateaux-Mouches” (time: 30 minutes). Free parking on the quay throughout the whole duration of the cruise.

The cocktail-dinner will take place in the “La Gabarre boat”.

www.eumweek.com | 27
Paris City Vision, the premier excursion company in France, offers a wide range of tours and excursions before, during and after European Microwave Week.

To book your tour or excursion, please contact Sally Garland on sally@connexhotelsandevevents.com

Information regarding Paris City Vision and last minute bookings will be available on the Tourist Information Desk within the registration area although Advance booking is recommended.

City Tour of Paris
Adult: € 21, Child (3-11 years old): € 13. Duration: 1.45hr
The best of Paris in a panoramic bus! Discover the Place de l’Opéra, the Champs-Elysées, the Eiffel Tower, the Louvre, Notre Dame Cathedral, Saint-Germain-Des-Prés. Recorded commentary available in French, English, Spanish, German, Italian, Portuguese, Japanese, Mandarin Chinese, Dutch, Russian, and Korean. Children’s commentary available in English, French, Spanish, Italian and German. The commentary takes you through the centuries and tells you about the history of Paris and the richness of the city’s cultural, architectural and artistic heritage. Four departures daily in a luxury air conditioned Coach, suited to clients and families looking for an overall glimpse or orientation. This is a non-stop tour.

Paris by Night City Tour
Adult: € 27, Child (3-11 years old): € 17. Departure: 22:00h
Admire the magic of Paris by night in a double-decker bus: the monuments and bridges are lit up emphasizing the fantastical atmosphere that reigns in the City of Lights. You will discover the Place de l’Opéra, the Champs Elysées, the Eiffel Tower, the Louvre, Notre Dame Cathedral, Saint Germain des Prés. Furthermore, you’ll learn about Paris’ history with the registered commentary. Recorded commentary available in French, English, Spanish, German, Italian, Portuguese, Japanese, Mandarin Chinese, Dutch, Russian, and Korean. Children’s commentary available in English, French, Spanish, Italian and German. This is a non-stop tour.

2 Days Hop on Hop off Pass
Adult: € 36, Child (4-11 years old): € 16. Departure: Every ten minutes from 09:30h - 19:00h
Visit Paris boarding an open top bus “Paris l’OpenTour” and enjoy an exceptional view of Paris. Hop on Hop off as often as you please and see Paris in your own time and at your own pace with the 4 tour itineraries. Explore the Paris you have been looking for, historical, romantic, fashionable, fun and shopper friendly while listening to nice audio guided commentaries! Bus frequency gives you the opportunity to visit at your own pace the top monuments and to be seated comfortably each time you take the bus. The pass is valid two consecutive days, whatever time you start the tour.

Visit of the Louvre with Audio Guide
Adult: € 37, Child (3-17 years old): € 6. Departure: 09:45h, 12:15h or 14:00h
Upon arrival at the agency, we will give you your entry ticket valid until closing of the museum, your audio guide to allow you to listen to recorded commentaries about the museum’s greatest works and a route map suggesting various possible itineraries to organize your free tour. Themed visits or itineraries taking in the major works: the Venus de Milo, the Coronation of Napoleon I and Leonardo de Vinci’s Mona Lisa. All audio guides must be returned after a maximum of 3 hours. Audio guide with recorded commentary: a deposit of 32 euros per audio guide will be required at the agency upon the departure. You will need to return the audio guide at the agency at the end of the tour, the deposit will then be given back to you.

Paris by Night: City Tour + Cruise
Adult: € 38, Child (3-11 years old): € 23. Departure: 19:15h
While waiting for night to fall, part of the tour takes place in daylight. Clients will be transported to the Bateaux Parisiens boarding point and escorted back to the coach by our hostess. The Seine River cruise takes us from the Eiffel Tower as far as the Ile de la Cité, with the Conciergerie and Notre Dame Cathedral, for about one hour. Clients have the possibility of finishing the tour in the Opera area (good location for restaurants and bars).

Skip-the-line Ticket to the Eiffel Tower
Adult: € 39, Child (under 4 years old): Free of charge.
Book your priority access ticket to climb the Eiffel Tower, and visit the first and second level of this unmissable Parisian monument at your own pace. With priority access, you can avoid spending up to two hours in a queue in high season and take full advantage of your visit to the Eiffel Tower. Enjoy panoramic views across the city and admire famous Parisian landmarks such as Notre-Dame Cathedral, the Sacré-Coeur and the Arc de Triomphe from 115 metres up. Meet your trilingual group leader (French, English, Spanish) near to the Eiffel Tower in Place Joffre in front of the Marshal’s statue, where you will pick up your no-queue ticket and be taken to the priority entrance area. As you ascend in the glass elevator, soak in this historic monument, a true architectural marvel. Measuring 324 metres high, the Eiffel Tower was constructed by Gustave Eiffel for the 1889 World’s Fair. A symbol of France across the world and a showcase for Paris, it now welcomes nearly 7 million visitors per year, making it the most visited fee-paying monument in the world.

Lunch at the Eiffel Tower with a Skip-the-Line-Ticket
Adult: € 45, Child (0-12 years old): € 21. Departure: 13:15h
Enjoy a truly unique experience at the “58 Tour Eiffel” restaurant located on the first floor of the Eiffel Tower, with uninterrupted panoramic views of the Paris skyline: Montmartre and the Sacré Coeur, the Invalides, the Champ-de-Mars, the Champs Elysées and the Arc de Triomphe. This chic and contemporary restaurant has the feel of a Parisian brasserie. Sample fresh seasonal produce with our delicious two-course menu.
PARTNER PROGRAMME

3 Days Hop on Hop off Pass & Seine
Adult: € 49, Child (4-11 years old): € 20.
Departure: Every ten minutes from 09:30h - 19:00h
With your Paris à la Carte pass, valid 3 consecutive days, board and get off whenever you want from buses or boats. You will enjoy fantastic views of Paris monuments and the Seine from the rear decks of the boats and the open-air upper deck on buses.

Skip-the-line Guided Tour of the Louvre Museum
Adult: € 54, Child (3-17 years old): € 33.
Departure: 09:00h, 14:15h, 18:30h
Your priority access ticket will allow you to follow your guide straight into the world's largest museum. No need to stand in line! This guided tour offers the perfect opportunity to learn about the museum's huge collection and its greatest works of art, such as the Mona Lisa, the Venus de Milo, and the Coronation of Napoleon.

City tour & Skip-the-Line Eiffel Tower
Adult: € 54, Child (3-11 years old): € 29.
Departure: 09:00h, 10:30h, 12:00h, 14:45h and 16:00h Daily

Early Evening Dinner Cruise “Decouverte Menu” - La Marina
Adult: € 60, Child (3-11 years old): € 35. Departure: 18:45h
Enjoy your evening beginning with a cruise on the Seine River, boarding Marina de Paris boat, to discover the main monuments of Paris differently. During the cruise, you will be served a "decouverte" set menu dinner.

Skip-the-Line Eiffel Tower Visit, Paris City Tour and Seine Cruise
Adult: € 62, Child (3-11 years old): € 37.
Departure: 09:00h, 10:30h, 12:00h, 14:45h and 16:00h

Paris by Night: City Tour, Cruise, Skip-the-Line Eiffel Tower
Adult: € 68, Child (3-11 years old): € 41. Departure: 18:15h

Visit Notre-Dame de Paris, Montmartre, Eiffel Tower in a Small Group
Adult: € 75, Child (3-11 years old): € 57.
Departure: 08:15h or 13:15h from your hotel or apartment in Paris

Paris by Night: Cruise, City Tour, Dinner on the Champs Elysées
After a tour through Paris “the city of lights” during the cruise on the Seine River and also on board our coach, we have booked you the best tables in the restaurant “Chez Clément” on the Champs-Élysées, one of the most fashionable of our capital city.

Paris by Night: City Tour + Lido Show
Adult: € 119. Departure: 21:00h
Visit Paris at night with a city tour by panoramic bus. Discover the monuments of Paris, the main areas, and the famous bridges over the Seine River in a magic atmosphere of beautiful illuminations. Stop at the Lido cabaret, situated half way up the Champs-Élysées and attend the evening new Lido show (duration of about 1h30). Lido show in Paris is very famous from all over the world with the wonderful Blue Bell Girls, the international attractions and various scenes. During the show you will be offered a glass of Champagne. You will be returned to the proximity of your hotel at the end of the evening.

Dinner at the Eiffel Tower with Skip-the-Line Access + Seine River Cruise
Adult: € 162. Departure: 18:15h
This night-time adventure includes a once-in-a-lifetime dinner on the first floor of the city’s most famous monument and a magical cruise along the Seine. Your priority ticket will allow you to skip the line and directly access the first floor of the Eiffel Tower. Thanks to its uninterrupted, breath-taking views over Paris, you will be able to spot Montmartre and the Sacré Coeur, the Invalides, the Champ-de-Mars, the Champs Elysées and the Arc de Triomphe.

Paris City Tour by night + Moulin Rouge Show with Champagne
Adult: € 169. Departure: 21:00h
We begin our evening with our “Paris by night” Drive to Montmartre area and reach the Moulin Rouge cabaret to attend its “Feerie” show with the famous French Can-Can. Half bottle of Champagne will be served during the show while you will admire the numerous attractions with the beautiful Doriss Girls. After the “Feerie” show, we will bring you to the close vicinity of your hotel in Paris.

Minibus Tour of Paris, Lunch at the Eiffel Tower, and Seine Cruise
Adult: € 215, Child (3-11 years old): € 156. Departure: 08:00h
Full day small group tour of Paris introducing you to the city’s most famous sights. Your minibus tour will include free time to explore Montmartre and Notre Dame Cathedral. This will be followed by lunch on the 1st floor of the Eiffel Tower before your day continues with an incredible boat trip along the Seine.

Dinner at the Eiffel Tower, Seine Cruise, Moulin Rouge Show
Adult: € 252. Departure: 18:15h
After crossing the Seine River, we climb to the first floor to the Eiffel Tower restaurant, the "58 Tour Eiffel", to have dinner (drinks included) After dinner we board on of the Bateaux Parisiens boat for our evening cruise* (duration approx 1 hour). After the Eiffel Tower and Seine river cruise, we cross Paris to the foot of the Montmartre hill. In the Pigalle district, enjoy the cabaret entertainment (“Feerie” show) at the Moulin Rouge. You will be accompanied to the close proximity of your hotel at the end of the evening.
| EuMIC01 | III-V HEMT based Millimeterwave and THz Integrated Circuits  
Chair: Ingmar Kallfass, University Stuttgart  
Co-Chair: Herbert Zirner, Chalmers University  
| EuMIC02 | Fully Integrated Power Amplifiers in GaN, GaAs and SiGe  
Chair: Frank van den Bogaard, TNO  
Co-Chair: Nathalie Delinge, University of Bordeaux  
| EuMIC03 | High Frequency Characterisation and Modelling  
Chair: Carlos Camacho-Penalosa, Universidad de Malaga  
Co-Chair: Gilles Dambonne, IEMN University of Lille 1  

| EuMIC01-01 | High-Sensitivity Wideband THz Detectors Based on GaN HEMTs with Integrated Bow-Tie Antennas  
M. Bauer1, A. Rämer2, S. Boppel1, A. Lisauskas1,3, S. Chevtchenko2, W. Heinrich2, V. Krozer1, H. G. Roskos1,  
1Johann Wolfgang Goethe Universität Frankfurt, Frankfurt am Main, Germany, 2Ferdinand-Braun-Institut, Leibniz Institut für Höchstfrequenztechnik, Berlin, Germany, 3Vilnius University, Vilnius, Lithuania  
| EuMIC02-01 | An E-band SiGe Power Amplifier with 28 dB Gain and 19.2 dBm Output Power Utilizing an On-Chip Differential Power Combiner  
M. Furkan, F. Ahmed, M. Jahn, A. Stelzer, Johannes Kepler University, Linz, Austria  
| EuMIC03-01 | Cold-Source Cryogenic Characterization and Modeling of a mHEMT Process  
R. Cleriti, S. Colangeli, W. Cicognani, M. Palomba, E. Limiti, University of Rome Tor Vergata, Roma, Italy  

| EuMIC01-02 | Ultra-Broadband W-Band Frequency Multiplier-by-Twelve MMIC  
U. J. Lewark1, L. John1, S. Wagner1, A. Tesmann1, A. Leuther1, T. Zwick1, I. Kallfass1,  
1Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany  
| EuMIC02-02 | Reduced-Size E-Band GaAs Power Amplifier MMIC  
A. Bessemoulin1, J. Taras1, M. Rodrigues1, M. G. McCulloch1, A. E. Parker2, S. J. Mahon1,  
1MACOM, North Sydney, Australia, 2Macquarie University, Sydney, Australia  
| EuMIC03-02 | Closed-Form Noise Parameters of a Transmission Line under Thermal Gradients  
S. Colangeli, W. Cicognani, R. Cleriti, M. Palomba, E. Limiti, University of Rome Tor Vergata, Roma, Italy  

| EuMIC01-03 | An E-band 1 W-Class PHEMT Power Amplifier MMIC  
K. Tsukashima, A. Otsuka, M. Kubota, T. Tokumitsu, S. Ogita, Sumitomo Electric Industries LTD, Taya-cho, Sakae-ku, Yokohama, Japan  
| EuMIC02-03 | Monolithic Three-Stage 6–18 GHz High Power Amplifier with Distributed Interstage in GaN Technology  
P. Dennler, S. Maroldt, R. Quay, O. Ambacher, Fraunhofer Institute for Applied Solid State Physics, Freiburg, Germany  
| EuMIC03-03 | Selection of Compressed Training Data for RF Power Amplifier Behavioral Modeling  
Z. Wang, J. Dooley, K. Finnerty, R. Farrell, National University of Ireland Maynooth, Maynooth, Ireland  

| EuMIC01-04 | U-Band pHEMT Divide-by-Three ILFD  
W. Chang1, C. Meng1, K. Tsung1, G. Huang2,  
1National Chiao Tung University, Hsinchu, Taiwan, 2National Nano Device Laboratories, Hsinchu, Taiwan  
| EuMIC02-04 | GaN MMICs for Microwave Backhaul: Doherty vs. Combined Class-AB Power Amplifier  
R. Giofrè1, L. Piazzon1, F. Giannini1, P. Colantonio1, V. Camarchia1, R. Quaglia1, M. Pirlo1, C. Ramella2, I. Mustazir2,  
1University of Roma Tor Vergata, Roma, Italy, 2Politecnico di Torino, Turin, Italy  
| EuMIC03-04 | Under-Sampling Effects and Computational Cost Reduction in RF Power Amplifier Behavioral Modeling  
T. Wang, P. L. Gilabert, G. Montoro, Universitat Politècnica de Catalunya (UPC), Castelldefels, Spain  

| EuMIC01-05 | Miniaturized Broadband Up-Converter MMIC  
A. Bessemoulin1, E. R. Convert1, S. J. Mahon1, S. G. Parker2,  
1MACOM, North Sydney, Australia, 2Macquarie University, Sydney, Australia  
| EuMIC02-05 | Compact Design of Linear Doherty Power Amplifier with Harmonic Control for Handset Applications  
y. Cho1, K. Moon1, B. Park1, J. Kim1, H. Iw1, B. Kim1,  
1Pohang University of Science and Technology (POSTECH), Pohang, Republic of Korea, 2Pohang University of Science and Technology (POSTECH), Pohang, Republic of Korea  
| EuMIC03-05 | Under-Sampling Effects and Computational Cost Reduction in RF Power Amplifier Behavioral Modeling  
T. Wang, P. L. Gilabert, G. Montoro, Universitat Politècnica de Catalunya (UPC), Castelldefels, Spain  

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**MONDAY**

| EuMIC02 | 08:30h - 08:50h  
| EuMIC01 | 08:50h - 09:10h  
| EuMIC03 | 09:10h - 09:30h  
| EuMIC01 | 09:30h - 09:50h  
| EuMIC02 | 09:50h - 10:10h  
| EuMIC03 | 10:10h - 10:30h  
| EuMIC01 | 10:30h - 10:50h  
| EuMIC02 | 10:50h - 11:10h  
| EuMIC03 | 11:10h - 11:30h  

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EuMIC04
EuMIC Opening Session
Chair: Eric Kerhervé, EuMIC 2015 Chair
Co-Chair: Didier Floriot, EuMIC 2015 Co-Chair

10:50h - 11:00h
Welcome Address
Opening of the European Microwave Integrated Circuits Conference 2015
Eric Kerhervé, EuMIC 2015 Chair

11:00h - 11:45h
Planar UTBB FD-SOI Technology for Highly Energy Efficient Devices
Andreia Cathelin, STMicroelectronics, Crolles, France

The revolution of the Internet of Things promises an exponential growth of connected devices. To sustain this market demand, the semiconductor industry requires a real breakthrough in energy efficiency both for the connected devices and for the communication infrastructure. Innovative solutions for very energy efficient systems are mandatory to continue the growth the semiconductor industry has enjoyed, covering ultra-low power systems, energy management and harvesting. This talk will present the development of the 28nm UTBB FD-SOI (Ultra-Thin Body and Buried-oxide Fully Depleted Silicon On Insulator) technology and its main characteristics, especially suited for highly energy efficient operation (even in ultra-low voltage conditions), not limited to digital logic but also on memory bit-cells and exceptional analogRF characteristics. Several application domains will be illustrated demonstrating how the technology can enable new and innovative applications in the field of IoT, wearable, mobile and server.

11:45h - 12:30h
Technologies for RF Power: GaN-HEMT and Si-LDMOS
Thomas Rödle, NXP Semiconductors, Nijmegen, The Netherlands

GaN-HEMT technology has been commercially available for several years and is said to be a disruptive technology for RF Power applications. Nevertheless, this technology had difficulties to establish a solid foothold against Si-LDMOS in high power and high frequency applications (frequencies between 100 MHz and 4 GHz, saturated output powers between 1 W and 1 kW). The intrinsic performance advantages of GaN-based transistors due to the semiconductor material properties are undisputed. These allow to expand the useful frequency range and enable the application of more advanced power amplifier (PA) architectures to push the efficiency. In order to become a successful PA technology however, more is needed. A few elements which will be discussed in this talk are reliability, manufacturability, cost and application support. NXP Semiconductors has worked consistently since more than 10 years on GaN-HEMT technology for RF Power. This together with our strong position as supplier of Si-LDMOS based solutions to the RF Power market will allow us to give an un-biased view of where GaN stands in this journey towards a mature, cost-efficient technology which makes a real difference for our customers.
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<td>Thermal Characterization of Microwave Devices</td>
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<td>K. Yazawa1,2, D. Kendig1, A. Shakouri2, Microsion, LLC, Santa Clara, United States,</td>
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<td>1Purdue University, West Lafayette, United States</td>
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<td>D. Chang, Y. Noh, I. Yem, Electronics and Telecommunications Research Institute, Daejeon, Republic of Korea</td>
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<td>Co-Chair: Ali Rezaad, University of Manchester</td>
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<td>A 42-71 GHz 90 nm CMOS Injection-locked Voltage Controlled Oscillator Using Bulk Injection Technique</td>
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<td>A 100-GHz Phase Shifter in 28-nm CMOS SOI</td>
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<td>Wideband Millimeter-Wave Active and Passive Mixers in 28 nm Bulk CMOS Technology</td>
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<td>D. Parveg, M. Varonen, M. Karkkainen, D. Karaca, A. Vahdati, K. Halonen, Aalto University, Espoo, Finland</td>
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## MONDAY

### EuMC/EuMIC03

**GaN Based Power Amplifiers**  
Chair: Paolo Colantonio, Univ. of Roma Tor Vergata  
Co-Chair: Vincenzo Carubba, Fraunhofer Institute For Applied Solid State Physics (IAF)

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<td>A Compact Tri-Band GaN Voltage-Mode Class-D/SS PA for Future 6-8 GHz LTE Picocell Applications</td>
<td>A. Wentzel, M. Martinez-Mendoza, W. Heinrich, Ferdinand-Braun-Institut (FBH), Leibnitz-Institut fuer Hochfrequenztechnik, Berlin, Germany</td>
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<td>EuMC/EuMIC03-02</td>
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<td>V. Carubba, E. Ture, S. Maroli, M. Musser, F. Van Raay, R. Quag, O. Ambacher, Fraunhofer Institute For Applied Solid State Physics IAF, Freiburg, Germany</td>
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<td>EuMC/EuMIC03-03</td>
<td>A First Step Towards a 230W SSPA for Galileo System Exploiting European GaN Technology</td>
<td>R. Giofre, P. Colantonio, E. Cipriani, R. Danieli, F. Giannini, L. Gonzalez, F. De Amica, L. Cabrini, University of Roma Tor Vergata, Roma, Italy, FTTI Norte, Santander, Spain</td>
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<td>C-Band Power Amplifier Design Based on Low-Frequency Waveform Engineering</td>
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### EuMC/EuMIC04

**ICs-based Tuning Techniques and Modulation Circuits for Millimeter-Wave and 5G systems**  
Chair: Noriharu Suematsu, Tohoku University  
Co-Chair: Robert Weigel, University of Erlangen

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<td>A Digital 70-140-GHz Impedance Tuner in 130-nm CMOS Technology</td>
<td>M. Perron, C. Wagner, H. Jaeger, A. Steber, Johannes Kepler Universitét Linz, Linz, Austria, DICE, Linz, Austria</td>
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<td>EuMC/EuMIC04-03</td>
<td>Large Bandwidth Tunable Analog Equalizer Based on a Differential Cascade Amplifier Cell for 100-Gbaud Communication Systems</td>
<td>R. Mezenta, J. Dupuy, J. Jorge, A. Konczykowska, J. Riet, V. Nadjacsi, A. Ouslimani, III-V Lab, Marcourusis, France, ECS-Lab, ENSEA, Cergy, France</td>
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<td>EuMC/EuMIC04-04</td>
<td>High Speed Phase Modulator Driver Unit in 55 nm SiGe BiCMOS for a Single-Channel 100 Gb/s NRZ Silicon Photonic Modulator</td>
<td>J. Prades, A. Ghiotto, D. Passage, E. Kerhervé, Univ. Bordeaux, Talence, France, STMicroelectronics, Crolles, France</td>
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<td>A High Linearity, Image/LO-Rejection IQ Up-Conversion Mixer for 5G Cellular Communications</td>
<td>C. Byeon, J. Lee, D. Lee, M. Kim, J. Son, Samsung Digital Media &amp; Communications R&amp;D Center, Suwon, Republic of Korea</td>
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EuMW 2015
EuMW/EuMC Opening Session
Chair: Hervé Aubert, EuMW 2015 General Chair
Co-Chair: Serge Verdeyme, EuMC 2015 Chair

10:50h - 11:55h
Welcome Addresses
Opening of the European Microwave Week 2015
Hervé Aubert, EuMW 2015 General Chair
EuMA Welcome Address
Wolfgang Heinrich, EuMA President
Opening of the European Microwave Conference 2015
Serge Verdeyme, EuMC 2015 Chair
Greetings from IEEE MTT-S
Ke Wu, IEEE MTT-S President

11:15h - 11:40h
Space Antennas on Satellites, for Telecommunications and Earth Observations Missions: Past Evolutions and Future Trends
Bruno Le Stradic, Airbus DS Space Systems, France

Antennas are at the heart of satellites missions, very much key to the overall performance for all types of applications: telecommunications, radar, and passive microwave radiometry. In the last twenty years or so, whilst the general principles have remained remarkably stable, major improvements have occurred, both at architecture and technology levels, at the same time modeling tools & methods now allow real time accurate simulations.

In the area of Telecommunications from the geostationary orbit, the general trend towards larger more powerful satellites has given birth to very complex “multi – large reflectors” antenna farms mixing all frequencies from L to Ka bands. Besides, the ever increasing need for flexibility, not any more restricted to mobile and military missions, is pushing towards Direct Radiating Arrays or Semi-Active antennas, with on-board digital beam-forming having become standard.

For Remote Sensing, imaging Synthetic Aperture Radars now routinely use active transmit-receive modules, and advances in technology have allowed passive radiometry to explore new frontiers: from the maximum 200 GHz frequency on AMSU-B up to the 600 GHz+ of the new generation microwave sounders under development by the European Space Agency, and with a much improved frequency resolution.

And, from here, let us dream about what the future has in store for us: digitally controlled antennas with large reflectors “re-shapeable” in orbit, smart skins, multi-satellite interferometers assembled in Space for radio-astronomy.

11:40h - 12:05h
Awards Ceremony
Chair: Alexander Yarovoy, EuMA Awards Chair
EuMA Distinguished Service Award
EuMA Outstanding Career Award

12:05h – 12:30h
30 Years of Innovation in TAS Radar Altimetry Product Line for Earth Climate Monitoring
Laurent Phalippou, Thales Alenia Space, France

Radar altimetry provides vital data for the observation of Earth Climate Change and operational oceanography. Since the beginning of the experimental radar altimetry missions, radar altimetry has evolved to operational applications. Altimeter data are used routinely in operational ocean forecasting models providing crucial information for driving the ocean circulation and currents. Those data are also used to extract the sea level rise and large scale phenomena such as El Nino events. Thales Alenia Space has been involved in radar altimeters since the 1980’s with the experimental Poseidon-1 Ku Band radar which paved the way to the current TAS altimeter product line all based on SSPA technology. In the 90’s two major evolutions were made to the product line with the design of SAR interferometric radar altimeters in Ku band and a compact Ka band radar altimeter with a built-in radiometer. These altimeters were the first of their kind in space and they are still delivering unprecedented quality data. Lately the product line evolved again with a new design for an ocean radar altimeter combining the conventional and the SAR mode operation at these same time. TAS is also involved in swath altimetry for the design and manufacturing of the Radio-Frequency Unit of the swath altimeter KarIn for the SWOT mission. The presentation will give an overview of the radar designs and the key technological challenges with the link with the science applications and performances.
EuMC/EuMIC Poster Session
Chair: Denis Barataud, University of Limoges
Co-Chair: Eric Tournier, LAAS-CNRS, University of Toulouse
12:30h - 14:10h
The posters are on display from 12:30h - 14:10h
The authors are present for discussion from 12:30h - 14:10h

EuMIC/EuMIC Poster01-01
A Novel Broadband High-Power Source-Pull/Load-Pull Concept for the HF- to UHF-Range
F.A. Maier1, A. Grede1, D. Gruner1, R. Quay2, P. Waltereit2, O. Ambacher2, 1TRUMPF Hüttinger GmbH & Co. KG, Freiburg, Germany, 2Fraunhofer Institute of Applied Solid State Physics, Freiburg, Germany

EuMIC/EuMIC Poster01-02
Temperature Insensitive PA Bias Circuit With Digital Control Interface Using InGaP/GaAs HBT Technology
W. Chang1, C. Meng1, S. Wong2, H. Chien3, G. Huang3, 1National Chiao Tung University, Hsinchu, Taiwan, 2Richwave Technology Corporation, Taipei, Taiwan, 3National Nano Device Laboratories, Hsinchu, Taiwan

EuMIC/EuMIC Poster01-03
A WLAN RF CMOS Power Amplifier with Power Detector, High Harmonic Suppression, and Temperature Compensation
W. Li, S. Wang, G. Lin, Industry Technology Research Institute, Hsinchu, Taiwan

EuMIC/EuMIC Poster01-04
Frequency-Agile Packaged GaN-HEMT using MIM Thickfilm BST Varactors
S. Preis1, A. Wiens1, N. Wolff1, R. Jakoby2, W. Heinrich1, O. Bengtsson1, 1Ferdinand-Braun-Institut Leibniz-Institut fuer Hochfrequenztechnik, Berlin, Germany, 2Technische Universität Darmstadt, Darmstadt, Germany

EuMIC/EuMIC Poster01-05
A New Variant of the Indirect Learning Architecture for the Linearization of Power Amplifiers
J. Chani-Cabuana1, C. Fager1, T. Eriksson1, 1Department of Signals and Systems, Chalmers University of Technology, Gothenburg, Sweden, 2 Department of Microtechnology and Nanoscience, Chalmers University of Technology, Gothenburg, Sweden

EuMIC/EuMIC Poster01-06
High Efficiency Ultra Broadband GaN Amplifier Using Series-Shunt Inductor Matching Network
E. Konrads, A. Sugimoto, C. M. Andersson, S. Sakata, H. Koyama, K. Yamaoka, H. Fukumoto, Mitsubishi Electric Corporation, 5-1-1, Ofuna, Kamakura, Japan

EuMIC/EuMIC Poster01-07
Coupled-Oscillator System With Two Stable Phase-Shift Intervals
F. Ramirez, A. Suarez, S. Sancho, Universidad de Cantabria, Santander, Spain

EuMIC/EuMIC Poster01-08
Project-Based RF/Microwave Education
R. L. Campbell, B. Pejcinovic, Portland State University, Portland, United States

EuMIC/EuMIC Poster01-09
The Microwave Virtual Laboratory for RF Engineers Education
D. S. Gubskij, V. V. Zemlyakov, I. V. Mamay, Southern Federal University, Rostov-on-Don, Russian Federation

EuMIC/EuMIC Poster01-10
Real-Time Microwave Remote Laboratory Architecture
S. Farah1, A. Benachenhou1, G. Neveux2, D. Barataud1, G. Andrieu2, 1University of Mostaganem, Mostaganem, Algeria, 2XLIM CNRS UMR 7252, University of Limoges, Limoges, France
TUESDAY

EuMIC11
SiGe BiCMOS-based Millimeterwave Circuits
Chair: Nils Pohl, Fraunhofer FHR
Co-Chair: Emanuel Cohen, Israel Institute of Technology

EuMIC12
Innovative GaN and Si Technologies and Applications
Chair: Didier Floriot, UMS
Co-Chair: Jean-Christophe Nallatamby, XLIM University of Limoges

EuMC/EuMIC07
Focus Session on Advances in THz and Opto-Nanoelectronics
Chair: Luca Pierantoni, Universita Politecnica Delle March
Co-Chair: Davide Mercarelli, Universita Politecnica Delle March

EuMIC11-01
A Novel W-band Bottom-LO-Configured Sub-Harmonic Mixer IC in 130-nm SiGe BiCMOS
X. Yang1, X. Xu1, Z. Sun1, T. Shibata2, T. Yoshimasu1, N. Toshima1, Waseda University, Tokyo, Japan

EuMIC12-01
Analysis of a GaN/SIC UHF Radar Amplifier for Operation at 125 V Bias
G. F. Formicone, J. Custer, Integra Technologies, Inc., El Segundo, United States

EuMC/EuMIC07-01
Nanoresonator Based Dielectric Surfaces for Light Manipulation (FS paper)
F. Silvestri1,2, E. Pisano3, G. Gerini1,2, V. Lancellotti2, V. Galdi3, 1Netherlands Organization for Applied Scientific Research, TNO, Delft, Netherlands, 2Eindhoven University of Technology, TUE, Eindhoven, Netherlands, 3University of Sannio, Benevento, Italy

EuMIC11-02
Key Components of a D-Band Dicke-Radiometer in 90 nm SiGe BiCMOS Technology
R. Ben Yishay, E. Shumaker, D. Elad, IBM Haifa Research Lab, Haifa, Israel

EuMIC12-02
Robustness Limit Investigation by Load pull Measurement of Industrial 0.25-µm AlGaN-GaN HEMTs
C. Chang1, A. Nobre-Santos1, B. Lambert1, D. Floriot1, J. Crone4, B. Blanck4, UMS SAS, Villebon sur Yvette, France, 1UMS GmbH, Ulm, Germany

EuMC/EuMIC07-02
Performance Evaluation of Novel Technologies for Terahertz Reflectarrays

EuMIC11-03
An Antenna-Coupled 0.49 THz SiGe HBT Oscillator for Active Illumination in Terahertz Imaging Applications
P. Hilger1, J. Grzyb1, R. Lachner1, U. Pfeiffer1, University of Wuppertal, Wuppertal, Germany, 1Infinion Technologies AG, Neubiberg, Germany

EuMIC12-03
AlGaN/GaN HEMT with fT:100 GHz and fmax:128 GHz
Y. Durmus1, D. Yilmaz1, A. Toprak1, A. B. Turhan1, O. A. Sen1, E. Ozbay1,2,3, 1Nanotechnology Research Center, Bilkent University, Ankara, Turkey, 2Department of Electrical and Electronics Engineering, Bilkent University, Ankara, Turkey, 3Department of Physics, Bilkent University, Ankara, Turkey

EuMC/EuMIC07-03
Optical Antennas in Hybrid Photonic Systems
R. Hendrikx, H. Doeleman, FOM Institute AMOLF, Amsterdam, Netherlands

EuMIC11-04
A 246 GHz Fundamental Source with a Peak Output Power of 2.8 dBm
N. Sarmah1, B. Heinemann2, U. R. Pfeiffer1, 1University of Wuppertal, Wuppertal, Germany, 2IHP GmbH, Frankfurt Oder, Germany

EuMIC12-04
New Ultra Low ESR Mosaic PICS Capacitors For Power Conversion
M. M. Jatlaoui, L. Fourneaud, F. Voiron, IPDiA, Caen, France

EuMC/EuMIC07-04
Ballistic Simulation of Ratchet Effect in Antidot Lattices Patterned on Graphene
L. Pascault1, D. Mercarelli1,2, F. Cockett1, T. Rozzi1, Universita Politecnica delle Marche, Ancona, Italy, 1Laas-CNrs, Toulouse, France, 2Istituto Nazionale di Fisica Nucleare (INFN), Frascati, Italy

EuMIC11-05
Porous Silicon as a Substrate for the Integration of High Performance On-chip Antennas
P. Sarafis1, A. Nasiopoulou1, C. Hseu2, P. Benech1, 1National Center for Scientific Research (NCSR), Athens, Greece, 2Institut polytechnique de Grenoble (Grenoble INP), Grenoble, France

EuMIC12-05
Modeling and Applications of Millimeter-Wave Slow-wave Coplanar Coupled Lines in CMOS
D. Paveg, A. Vahdati, M. Varonen, D. Hong, D. Kärkkäinen, K. Halonen, Aalto University, Espoo, Finland

EuMC/EuMIC07-05
Width-Modulated Magnonic Crystal and Its Application for Spin-Wave Logic
A. A. Nikitin1, A. B. Ustinov1, A. A. Semenov1, A. V. Chumak1, A. A. Sergi1, V. I. Vasyuchka2, E. Lahderanta3, B. A. Kalinikos1, B. Hillebrands2, 1St. Petersburg Electrotechnical University, St. Petersburg, Russia, 2Technische Universität Kaiserslautern, Kaiserslautern, Germany, 3Lappeenranta University of Technology, Lappeenranta, Finland
## EuMC/EuMIC08

**Emerging Techniques for Parametric Tuning and Frequency Stability**

Chair: Amir Mortazavi, University of Michigan
Co-Chair: Tan Phu Vuong, IMEP-LAHC, Grenoble INP

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<td>Low Bias Voltage Tunable Phase Shifter Based on Inkjet-Printed BST MIM Varactors for X-/Band Phased Arrays</td>
<td>M. Nikfalazar, A. Mehmood, M. Soltani, A. Wiers, Y. Zheng, H. Maare, R. Jakoby, M. Miklajek, A. Friedrich, C. Kohler, J. Binder, 1Technical University of Darmstadt, Darmstadt, Germany, 2Karlsruhe Institute of Technology, Karlsruhe, Germany</td>
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<td>Characterization of GaN-based HEMTs as Varactor Diode Devices</td>
<td>A. Hamdoun, L. Roy, M. Himdi, O. Lafond, 1Carleton University, Ottawa, Canada, 2University of Rennes1, Rennes, France</td>
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<td>A Wideband Class-AB Tunable Active Filter</td>
<td>L. Pantoli, V. Stornelli, G. Leuzzi, University of L’Aquila, L’Aquila, Italy</td>
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<td>Stable Frequency Dissemination via Optical Fiber based on Passive Phase Fluctuation Cancellation</td>
<td>J. Wei, F. Zhang, S. Pan, L. Yu, 1Key Laboratory of Radar Imaging and Microwave Photonics, Ministry of Education, Nanjing, China, 2Wuhan Electronic Information Institute, Wuhan, China</td>
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## EuMC05

**Power-Amplifier Architectures**

Chair: Luc Lapierre, CNES
Co-Chair: Olof Bengtsson, Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik

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<td>IF Predistortion in the Block Upconversion Path for Modern Satcom Applications in the Ku-Band</td>
<td>D. Maassen, F. Rauchschneid, G. Boeck, 1Berlin Institute of Technology, Berlin, Germany, 2Leibnitz-Institut fuer Hoehstfrequenztechnik, Berlin, Germany</td>
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<td>Improving the Power Evenness of Power Amplifiers using Out-of-Phase Combining</td>
<td>A. Alt, A. Grede, D. Gruner, TRUMPF Huettinger GmbH + Co. KG, Freiburg, Germany</td>
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<td>A Load-Modulated Low-Power Amplifier with Average Power Tracking</td>
<td>K. Mimis, S. Wang, G. T. Watkins, Toshiba Research Europe Limited, Bristol, United Kingdom</td>
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<td>EuMC05-04</td>
<td>Low Complexity Charge Pump Envelope Tracking RF Power Amplifier</td>
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<td>EuMC05-05</td>
<td>Simplified, High Performance Transceiver for Phase Modulated RFID Applications</td>
<td>N. B. Buchanan, V. Fusco, Queens University Belfast, Belfast, United Kingdom</td>
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## EuMC06

**Chipless RFID Technologies**

Chair: Martin Vossiek, University Erlangen-Nuremberg
Co-Chair: Antonio Lazaro, Universitat Rovira i Virgili

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<td>A Compact Printable Dual-Polarized Chipless RFID Tag using Slot Length Variation in 'I' Slot Resonators</td>
<td>M. Islam, N. Karmakar, Monash University, Clayton, Australia</td>
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<td>EuMC06-02</td>
<td>Higher Order Pulse Modulators for Time Domain Chipless RFID Tags with Increased Information Density</td>
<td>C. Mandel, M. Schüller, M. Nickel, B. Kubina, R. Jakoby, R. Pöpperl, M. Vossiek, 1Technische Universität Darmstadt, Darmstadt, Germany, 2Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany</td>
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<td>EuMC06-03</td>
<td>Simplified, High Performance Transceiver for Phase Modulated RFID Applications</td>
<td>N. B. Buchanan, V. Fusco, Queens University Belfast, Belfast, United Kingdom</td>
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<td>Improvement of RCS Response of U Shaped Strip Based Chipless RFID Tags</td>
<td>M. Polivka, J. Havlicek, M. Svanda, J. Machac, Czech Technical University in Prague, Prague 6, Czech Republic</td>
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<td>Modulated Corner Reflector Using Frequency Selective Surfaces for FMCW Radar Applications</td>
<td>A. Lazaro, J. Lorenzo, R. Villanono, D. Girbau, Universitat Rovira i Virgili, Tarragona, Spain</td>
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**TUESDAY**
16:10h - 18:00h

TUESDAY

EuMIC10
Novel Modal Techniques
Chair: Maurizio Bozzi, University of Pavia
Co-Chair: Clive Tzuang, Tianjin University

16:10h - 16:30h

EuMC10-01
Characteristic Mode Analysis of Electromagnetic Structures
D. J. Ludick1, P. Futter1, U. Jakobus2, R. Fedderle2, M. Schick3, E. Lezar1, Altair Development S.A. (Pty) Ltd, Stellenbosch, South Africa, 2Altair Engineering GmbH, Boeblingen, Germany

16:30h - 16:50h

EuMC10-02
A characteristic Mode Analysis of Parallel Resonances Exploiting the Finite Element Scheme
C. L. Zekios, D. G. Makris, R. T. Maximidis, P. C. Allilomes, G. A. Kyriacou, Democritus University of Thrace, Xanthi, Greece

16:50h - 17:10h

EuMC10-03
Monolithic Leaky-Mode Antenna on the Perforated Ground Plane: Modal Characteristics
X. Li, Q. Weng, H. Wu, C. C. Tzuang, Tianjin University, Tianjin, China

17:10h - 17:30h

EuMC10-04
An Inner Outer Iteration Scheme for the Spurious Free Solution of Polynomial Eigenvalue Problems of Electrically Large Structure
C. L. Zekios, P. C. Allilomes, G. A. Kyriacou, Democritus University of Thrace, Xanthi, Greece

17:30h - 18:00h

EuMC10-05
Frequency and Polarization Selectivity of Graphene Strip Gratings
T. L. Zinenko1, A. Matsushima2, A. I. Nosich3, 1Institute of Radio-Physics and Electronics NASU, Kharkiv, Ukraine, 2Kumamoto University, Kumamoto, Japan, 3Institute of Radio-Physics and Electronics NASU, Kharkiv, Ukraine
EuMC11: Channel Measurement and Propagation
Chair: Patrice Papusco, LabSTIC, Telecom Bretagne
Co-Chair: Michal Mrozowski, Gdańsk University of Technology

EuMC12: Special Session on Additive Manufacturing Techniques for RF Modules
Chair: Manos Tentzeris, Georgia Tech
Co-Chair: Dominique Baillargé, University of Limoges

EuMC13: Circuit Design for Power Amplifiers
Chair: Georg Fischer, FAU Erlangen
Co-Chair: Franco Giannini, University of Roma Tor Vergata

EuMC14: Dynamic Behaviour of a Low-Noise Amplifier GaN MMIC under Input Power Overdrive
C. A. Andrei, O. Bengtsson, R. Doerner, S. A. Chevtchenko, W. Heinrich, M. Rudolph,
Brandenburgische Technische Universität Cottbus-Senftenberg, Cottbus, Germany,
Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany

EuMC15: Broadband Transmission Performance and Antenna Displacement Tolerance in 4x4 Short-Range MIMO Simple Decoding

EuMC16: Ceramic-Based Additive Technologies for RF Applications
Dominique Baillargé, University of Limoges, France

EuMC17: A 2.5-GHz Band Low Voltage High Efficiency CMOS Power Amplifier IC Using Parallel Switching Transistor for Short Range Wireless Applications
T. A. Kurniawan, X. Yang, X. Xu, T. Yoshimasa, Waseda University, Kitakyushu, Japan

EuMC18: A 0.85 - 2.7 GHz Two-Cell Distributed GaN Power Amplifier Designed for High Efficiency at 1-dB Compression
C. M. Anderson, E. Kuvasta, Y. Kawamura, S. Shinjo, K. Yamanaka, Mitsubishi Electric Corporation, Ofuna, Japan

EuMC19: A 230 W, 1.8 to 2.2 GHz Broadband LDMOS Power Amplifier Utilizing Multi-Section Integrated Passive Device Input Matching
L. Zhao, M. Watts, B. Noori, J. Jones, Freescale Semiconductor, Inc., Tempe, Arizona, USA

EuMC20: A 20 W, 1.8 to 2.2 GHz Broadband LDMOS Power Amplifier Using Multi-Section Integrated Passive Device Input Matching
L. Zhao, M. Watts, B. Noori, J. Jones, Freescale Semiconductor, Inc., Tempe, Arizona, USA

EuMC21: A Phase Noise Improvement of 19 GHz VCO with use of Feedback Coupled-Line Resonator
T. Kawasaki, A. Otosu, M. Kubota, T. Tokumitsu, S. Ogita, Sumitomo Electric Industries, LTD, Yokohama, Japan

EuMC22: A Push-Push Oscillator Array with Very Simple Coupling Circuits Using HEMT
T. Tanaka, T. Sameshima, I. Toyota, Saga University, Saga-shi, Japan

EuMC23: On-Body Propagation Characterization with an H-plane Substrate Integrated Waveguide (SIW) Horn Antenna at 60 GHz

EuMC24: 3D Printed SIW Structures
Stefano Moscato, University of Pavia, Italy

EuMC25: An Electrically Tunable X-Band Voltage-Controlled Oscillator Using Substrate Integrated Waveguide Dual-Mode Bandpass Filter with Circular Cavity
W. Huang, P. Chen, Z. Yu, L. Tian, J. Zhou, Southeast University, Nanjing, China
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<td>Reflectometers and Millimeterwave Characterization</td>
<td>Chair: Christophe Gaquiere, IMEP, Co-Chair: Philippe Ferrari, IMEP</td>
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**Tuesday, 16:00h - 16:30h**

- **EuMC15-01** An Advanced Tag Detection Technique for Chipless RFID Systems  
  M. Fantuzzi, D. Masotti, A. Costanzo,  
  1University of Bologna, Bologna, Italy,  
  2University of Bologna, Cesena, Italy

- **EuMC16-01** A Novel Wideband Microstrip Branch-Line Coupler with Compact Footprint  
  P. Kurgan, S. Kezeli, Reykjavik University, Reykjavik, Iceland

- **EuMC17-01** Design of a High Efficiency Rectifier with Wide Bandwidth and Input Power Range Based on the Time Reversal Duality of Power Amplifier  
  D. Wang, X. A. Nghiems, M. Wei, R. Negra, RWTH Aachen University, Aachen, Germany

- **EuMC18-01** Characterization of Quasi-Optical Focusing Systems at W-Band Frequencies  
  M. Kleinert, C. Zech, A. Hülsmann, M. Schlechtweg, G. Ambacher, Fraunhofer Institute for Applied Solid State Physics, Freiburg, Germany, University of Freiburg

**Tuesday, 16:30h - 16:50h**

- **EuMC15-02** A Multilayer Compact-Size UWB-UHF Antenna System for Novel RFID Applications  
  M. Fantuzzi, D. Masotti, A. Costanzo,  
  1University of Bologna, Bologna, Italy,  
  2University of Bologna, Cesena, Italy

- **EuMC16-02** Compact Wideband 3 dB Branch Line Coupler with Multiple Symmetric PI Section  
  R. K. Bank, P. K. Karaparthi V. K. Sholarpetti Subramanian, Indian Institute of Information Technology Design and Manufacturing (IIITDM), Kancheepuram, Chennai, India

- **EuMC17-02** High-Efficiency DC-to-RF/RF-to-DC Interconversion Switching Module at C-Band  
  R. Ishiakawa, K. Honjo, University of Electro-Communications, Chofu, Japan

- **EuMC18-02** Robotically Controlled Directivity and Gain Measurements of Integrated Antennas at 280 GHz  
  L. Boehm, S. Pleidl, F. Boergelsbach, M. Hitzler, C. Walschmidt, University of Ulm, Ulm, Germany

**Tuesday, 16:50h - 17:10h**

- **EuMC15-03** 3D Microwave Imaging System for the Remote Detection and Reading of RFID Tags  
  D. Henry, P. Pons, H. Aubert,  
  CNRS-LAAS, Toulouse, France, University of Toulouse, UPS, INSA, INP, LAAS-CNRS, Toulouse, France

- **EuMC16-03** Design and Characterisation of Novel W-band Wide-band Couplers and Six-port Circuit  
  M. Moldovan, S. O. Tatu, Institut national de la recherche scientifique, Montreal, Canada

- **EuMC17-03** High Efficiency and High Power GaN HEMT Inverse Class-F Synchronous Rectifier for Wireless Power Applications  
  S. Abbasian, T. Johnson, University of British Columbia, Kelowna, Canada

- **EuMC18-03** WR-5.1 Band, on-Wafer Characterization at Cryogenic Temperatures  

**Tuesday, 17:10h - 17:30h**

- **EuMC15-04** A Passive Temperature Sensor Based on a Printed Magnetoinductive-Wave (MIVY) Delay Line  
  F. Herrera-Martinez, J. Martinez-Cebrian, D. Deogracias-Vargas, Carlos III University in Madrid, Loganes, Spain

- **EuMC16-04** A Novel Trans-Directional Coupler Based on Vertically Installed Planar Circuit  
  A. N. Sykov, S. M. Struchkov, V. N. Putilov, N. Y. Rudy, Tomsk State University of Control Systems and Radioelectronics (TUSUR), Tomsk, Russian Federation

- **EuMC17-04** Matching Network Improvement for RF Energy Harvesters in Body Sensor Area Network Context  
  V. Kuhn, F. Seguin, C. Lahuec, C. Person, Lab-STIC, Telecom Bretagne, Brest, France

- **EuMC18-04** A Broadband 3-29 GHz Reflectometer with a Frequency Compensated Multilayer Sixport Structure  
  F. Trenz, M. Hofmann, R. Weigell, D. Kissinger, Friedrich-Alexander University Erlangen-Nuernberg, Erlangen, Germany, HIE, Frankfurt (Oder), Germany, ‘Technische Universität Berlin, Berlin, Germany

**Tuesday, 17:30h - 17:50h**

- **EuMC15-05** Microwave Characterization of Materials During Corrosion: Application to Wireless Sensors  
  M. Yari, B. Lesco, S. Rioual, F. Gallée, D. Piller, D. Thierry, Laboratoire de Magnétique de Bretagne, Brest, France, Labor-STIC UMR CNRS 3192, Institut Mine-Télécom, Brest, France, Institut de la Corrosion, Brest, France

- **EuMC16-05** A 300 kHz-13.5 GHz Directional Bridge  
  N. Drobotun, F. Mikheev, M. Mikhan, Tomsk, Russian Federation, Tomsk State University of Control Systems and Radioelectronics, Tomsk, Russian Federation

- **EuMC17-05** A Dual Band 915 MHz/2.44 GHz RF Energy Harvester  
  L. Fadel, L. Oyhenart, R. Berges, V. Vigneras, T. Taris, IMS Laboratory, Talence, France

- **EuMC18-05** Reflectometer Calibration With a Pair of Partially Known Standards  
  A. Aranovici, R. M. Weikle Jr, J. Hesler, Virginia Diodes Inc., Charlottesville, United States, University of Virginia, Charlottesville, United States

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| 08:50h - 09:10h | EuMC20  | Transmission Lines and Transitions                                   | Chair: Ian Robertson, University of Leeds  
               |         |                                                                     | Co-Chair: Marco Pasian, University of Pavia                                                                  |
| 09:10h - 09:30h | EuMC21  | Microwaves in Biological and Medical Applications                    | Chair: Juan-Mani Collantes, University of the Basque Country  
               |         |                                                                     | Co-Chair: Shokrollah Karimian, CERN                                                                         |
| 09:30h - 09:50h | EuMC19-01 | Wideband Equivalent Circuit for Non-aligned 1-D Periodic Metal Strips Coupled Gratings | C. Molero1, R. Rodriguez-Berral1, F. Mesa1, F. Medina1, University of Sevilla, Seville, Spain  
               |         |                                                                     | 'University of Seville, Seville, Spain                                                                       |
| 09:50h - 10:10h | EuMC20-01 | Modeling of Multiple Coated Coaxial Airlines Considering Finite Conductivity and Surface Roughness | S. Zinal, PTB, Germany  
               |         |                                                                     | Braunschweig, Germany                                                                                        |
| 10:10h - 10:30h | EuMC21-01 | A Novel Chipless RFID-Based Stretchable and Wearable Hand Gesture Sensor | A. Diet1, M. Grzeskowiak2, M. Benamara2, Y. Le Bihan1, C. Conesa1, G. Lisnguez1, F. Alves1, GEIPS UMR 8507 (CNRS, Centrale-Supélec, Univ. Paris Sud-11, UPMC), Univ. Paris Saclay, France  
               |         |                                                                     | Noisy le Grand/ Marie la vallée, France                                                                     |
| 10:30h - 10:50h | EuMC19-02 | Triple-Band Polarization-Independent Metamaterial Absorber using Destructive Interference | S. Ghosh1, S. Bhattacharyya1, Y. Kajiprath1, K. Chaurasia1, S. V. V. Srivastava1, Indian Institute of Technology Kanpur, Kanpur, India  
               |         |                                                                     | ‘University of Calcutta, Calcutta, India                                                                    |
| 10:50h - 11:10h | EuMC20-02 | Dielectric-Tube-Supported Metal Rod Transmission Line and its Application to Transition for 1mm Coaxial Connector at 80 GHz Band | S. Kitabayashi1, F. Kuroki1, Y. Kawahara1, National Institute of Technology, Kure  
               |         |                                                                     | College, Kure, Japan  
               |         |                                                                     | ‘Kawashima Manufacturing Co., Ltd, Kawasaki, Japan                                                         |
| 11:10h - 11:30h | EuMC21-02 | Detection Tube for Small HF RFID Tags, Thanks to Mutual Coupling with a Coil Resistor | A. Diet1, M. Grzeskowiak2, M. Benamara2, Y. Le Bihan1, C. Conesa1, G. Lisnguez1, F. Alves1, GEIPS UMR 8507 (CNRS, Centrale-Supélec, Univ. Paris Sud-11, UPMC), Univ. Paris Saclay, France  
               |         |                                                                     | Noisy le Grand/ Marie la vallée, France                                                                     |
| 11:30h - 11:50h | EuMC19-03 | Wave Scattering by PT-symmetric Epsilon-Near-Zero Periodic Structures | O.V. Shramkova1, G. P. Tsironis1, University of Crete, Heraklion, Greece  
               |         |                                                                     | ‘National Technical University of Athens, Athens, Greece                                                     |
| 11:50h - 12:10h | EuMC20-03 | Agile Phasers Constituted of Coupling-Free Nonuniform Stub-Loaded Transmission Lines | S. Taravati1, C. Caloz12, Polytechnique de Montréal, Montréal, Canada  
               |         |                                                                     | ‘King Abdulaziz University, Jeddah, Saudi Arabia                                                           |
| 12:10h - 12:30h | EuMC21-03 | Dielectric Characterization of Biocompatible Hydrogels for Application to Epidermal RFID Devices | S. Amendola1, C. Occhiuzzi23, A. Ajovalasit3, M. A. Sabatino12, C. Dispenza1, G. Marrocco1, University of Roma Tor Vergata, Rome, Italy  
               |         |                                                                     | ‘Radiodense srl, Rome, Italy  
               |         |                                                                     | ‘University of Palermo, Palermo, Italy                                                                    |
| 12:30h - 12:50h | EuMC19-04 | Short Wire Ultra-Wideband Filter and Polarizer                        | Z. Mostajabi1, J. Rashid-Mohassel21, ‘School of ECE, College of Engineering, University of Tehran, Tehran, Iran  
               |         |                                                                     | ‘Center of Excellence on Applied Electromagnetic Systems, School of ECE, College of Engineering, University of Tehran, Tehran, Iran |
| 12:50h - 13:10h | EuMC20-04 | A Wideband Vertical Microstrip-to-Microstrip Transition On Two Dual-Mode Slotline Resonators | X. Guo1, W. Wu1, L. Zhu1, Nanjing University of Science & Technology, Nanjing, China  
               |         |                                                                     | ‘University of Macau, Macau SAR, China                                                                     |
| 13:10h - 13:30h | EuMC21-04 | High Doses Wireless Radiation Sensor using Electromagnetic Transducers and Radar Interrogation | E. Debourg12, A. Rifai12, H. Aubert12, F. Pare12, I. Augustyniak3, P. Knapkiewicz2, J. Dubie1, M. Mutusia1, M. Olszacki1, LAAS-CNRS, Toulouse, France  
               |         |                                                                     | ‘University of Toulouse, France  
               |         |                                                                     | ‘Wroclaw University of Technology, Wroclaw, Poland                                                         |
| 13:30h - 13:50h | EuMC19-05 | Wire-Medium Loaded Planar Structures: A Novel Transmission-Line Model and Relevant Dispersion Properties | D. Comite1, P. Burghignoli1, P. Baccarelli1, A. Gail1, Sapienza University, Rome, Italy  
               |         |                                                                     | ‘University of Rome Tor Vergata, Rome, Italy                                                                |
| 13:50h - 14:10h | EuMC20-05 | Dual-Band Stepped-Impedance Transformer to Full-Height Substrate-Integrated Waveguide | P.A. Turalchuk1, M. Derkach2, O. G. Vendik1, I. B. Vendik1, St. Petersburg Electrotechnical University, St. Petersburg, Russian Federation  
               |         |                                                                     | ‘JSC Radar MMS, St. Petersburg, Russian Federation                                                         |
| 14:10h - 14:30h | EuMC21-05 | Propagation of Electromagnetic Waves Radiated by an Implanted Antenna | P.A. Turalchuk1, M. Derkach2, O. G. Vendik1, I. B. Vendik1, St. Petersburg Electrotechnical University, St. Petersburg, Russian Federation  
               |         |                                                                     | ‘JSC Radar MMS, St. Petersburg, Russian Federation                                                         |
### Wednesday

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<td>EuMC/EuRAD02</td>
<td>UWB Antenna System</td>
<td>Cyrille Menudier, University of Limoges; Michele Lalande, University of Limoges</td>
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<td>EuMC/EuRAD03</td>
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<td>Jean-Yves Dauvignac, University of Nice Sophia Antipolis; Alexander Yarovoy, Delft University of Technology</td>
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<td>EuMC/EuRAD01-01</td>
<td>Crossed-Slot Cavity Antenna in Slow-Wave SIW</td>
<td>A. Ho, E. Pistono, T. Vuong, A. Nielsen-Martin, University of Grenoble Alpes, Grenoble, France; Centre Technique du Papier, Grenoble, France</td>
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<td>R. Negrier, M. Lalande, V. Bertrand, J. Andrieu, V. Courdel, B. Shalaby, L. Pecastagnol, A. De Fermont, L. Desruisseaux, University of Limoges, France; Cisteme, Brive-la-Gaillarde, France; University of Limoges, France; SIAME, Pau, France; DGA, Bagneux, France</td>
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<td>EuMC/EuRAD03-01</td>
<td>Study on Multiple Stream Transmission by Using Multiple Polarizations</td>
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<td>EuMC/EuRAD01-02</td>
<td>Substrate Integrated Waveguide Slot-Fed Grid Array Antenna</td>
<td>O. Khan, J. Meyer, K. Baar, C. Waldschmidt, Robert Bosch GmbH, Leonberg, Germany; University of Ulm, Ulm, Germany</td>
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<td>EuMC/EuRAD02-02</td>
<td>Evaluation of a UWB Radar Interface for Low Power Radar Sensors</td>
<td>D. Genschow, J. Kloos, IHP, Frankfurt (Oder), Germany</td>
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<td>EuMC/EuRAD03-02</td>
<td>A Closed-Form Formula for RSSI-Based DoA Estimation with Switched Beam Antennas</td>
<td>S. Maddio, M. A. Passafiume, A. Cidronali, G. Manes, MIDRA - University of Florence, Florence, Italy</td>
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<td>EuMC/EuRAD01-03</td>
<td>Metamaterial Structures Composed of Multi-Layer Ceramic Capacitors for Antenna Applications</td>
<td>N. Michishita, H. Misoshita, National Defense Academy, Yokosuka, Japan</td>
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<td>A 1-21 GHz, 3-bit CMOS True Time Delay Chain with 274 ps Delay for Ultra-broadband Phased Array Antennas</td>
<td>F. Hu, K. Moothaain, National University of Singapore, Singapore; Singapore</td>
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<td>EuMC/EuRAD03-03</td>
<td>Synthesis of Multi-Element Antennas using a Measurement Test Bench</td>
<td>C. Menudier, E. Arnaud, M. Thevenot, F. Fezal, A. Ouaissi, N. Chevalier, S. Reynaud, T. Monedier, XLIM - University of Limoges, Limoges, France; Cisteme, Limoges, France</td>
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<td>Bulk-Glass Ceramic Based Stacked Dielectric Resonator Antenna As Phased Array Element</td>
<td>A. Mehmood, M. Nekifalazar, M. Sadrabi, R. Jakooby, M. Hovhaniyan, M. Litz, Technical University of Darmstadt, Darmstadt, Germany; Schott AG, Mainz, Germany</td>
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<td>Calibration of Polarmetric Radar System with Giant Aperture Antenna</td>
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<td>New Wideband Quadrature Rectangular Dielectric Resonator Antenna</td>
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<td>Ultra-Wideband Planar Antennas with Dual-Band Notched Characteristics Based on Electric Ring Resonators</td>
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<td>Impact of Soil on UWB Buried Antenna and Communication Link in IR-UWB WUSN Applications</td>
<td>H. Zemmour, G. Baudoin, C. Hamouda, A. Diet, M. Bianchi-Arditi, ESYCOM EA2552, ESE-Paris, Univ. Paris Est, France; GEEMPHEM UMR 8507, Univ. Paris Sud, France; GEEMPHEM UMR 8148, Univ. Paris Sud, France</td>
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## WEDNESDAY

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<td>EuMC23</td>
<td>Advanced Technologies for Planar, Tunable and Acoustic-Wave Filters</td>
<td>Chair: Vicente Boria, Technical University of Valencia Co-Chair: Cedric Quendo, University of Brest</td>
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<td>EuMC24</td>
<td>Millimeter-Wave Imaging</td>
<td>Chair: Lorenz-Peter Schmidt, FAU Erlangen-Nürnberg Co-Chair: Timo Jaeschke, Ruhr-University Bochum</td>
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### EuMC22-01
A 250 GHz Hetero-Integrated VCO with 0.7 mW Output Power in InP-on-BiCMOS Technology
M. Hossain1, N. Weimann1, B. Janke1, M. Lisker1, C. Meliani2, B. Tillack1, O. Krueger1, V. Krozer1, W. Heinrich1, 1Ferdinand-Braun-Institut, Berlin, Germany, 2IHP Microelectronics, Frankfurt (Oder), Germany

### EuMC22-02
Low Noise 89 GHz Detector Module for MetOp-SG
M. Hoefle1,2, O. Cojocari1, M. Sobornytskyy1, A. Jankowski1, I. Oprea1, A. Penirschke2, R. Jakoby1, T. Decoopman3, M. Perichaud1, P. Pironen1, 1ACST GmbH, Hanau, Germany, 2Technische Universität Darmstadt, Darmstadt, Germany, 3Airbus Defence & Space, Toulouse, France, 4European Space Agency, Noordwijk, Netherlands

### EuMC22-03
A 3.7 mW 75-87 GHz Injection-Locked Frequency Tripler using Bandwidth-Enhanced Transformer-Coupled Topology for Automatic Radar Applications
H. Huang1, M. Wu1, J. Tsai2, T. Huang1, 1National Taiwan University, Taipei, Taiwan, 2National Taiwan Normal University, Taipei, Taiwan

### EuMC22-04
High-Efficiency Low-Phase-Noise 79-GHz Gunn Oscillator Module
A. Nakamura1, J. Nikaido1, T. Aoki1, Y. Shirakata1, S. Takase1, YOKOWO Co., Ltd, Kita-ku, Japan

### EuMC22-05
Reflection and Band-stop Types of Self-injection Locked NRD Guide Gunn Oscillators Loading TEM Resonance Type Metal Rod Resonator Supported by PEEK Material at 60 GHz
M. Teramoto1, F. Kuroki1, National Institute of Technology, Kure College, Kure, Japan

### EuMC23-01
Applied Methodology for Harmonic Suppression of Microstrip Edge Coupled Bandpass Filters using Composite Circuit Materials
J. Coonrod, Rogers Corporation, Chandler, United States

### EuMC23-02
Design of Tunable Dual-Band Filter with Multiple Types of Resonators
Y. Cheng, H. Peng, Y. Chiang, Chung Gung University, Kwei-Shan, Taiwan

### EuMC23-03
A 2-Pole Tunable Bandpass Filter Using Commercial DigitallyTunable Capacitor
G. Chaabane1, C. Guines1, M. Chatras1, V. Madrangeas1, P. Blondy1, University of Limoges, France

### EuMC23-04
Acoustic-Wave-Lumped-Element Resonator (AWLR) Architectures for High-Q Reflective Bandstop Filters
D. Psychogiou1, R. Gómez-García2, D. Peroulis2, 1University of Alcalá, Alcalá de Henares, Spain, 2Purdue University, West Lafayette, United States, 3University of Alcalá, Alcalá de Henares, Spain

### EuMC24-01
Wideband 120 GHz to 140 GHz MIMO Radar: System Design and Imaging Results
T. Spreng1, S. Yuan1, V. Valenta1, H. Schumacher1, U. Siart3, V. Ziegler1, 1Airbus Group Innovations, München, Germany, 2Technische Universität München, München, Germany

### EuMC24-02
MIMO System for Fast Imaging at 90 GHz
R. Herschel1, S. Nowok1, P. Warok1, S. A. Lang1, N. Pohl1, Fraunhofer-Institut für Hochfrequenztechnik und Mikrowellenforschung (FHR), Wachtberg, Germany

### EuMC24-03
A Sparse Array Based THz Imaging System for Volume Inspection
B. Baccouche1, A. Keil1, M. Kahn1, P. Haring1, T. Effert1, J. Jonascheit1, F. Friederich1, Fraunhofer IPM, Kaiserslautern, Germany, 2Becker Photonik GmbH, Porta Westfalica, Germany, 3University Siegen, Siegen, Germany, 4Synview GmbH, Bad Homburg, Germany

### EuMC24-04
A Fast Rotating Scanning Approach for Millimeter Wave Imaging
D. Nuessler1, S. Heinen1, R. Brauns1, S. Kose1, N. Pohl1, Fraunhofer FHR, Wachtberg, Germany

### EuMC24-05
Characterizing Surface Profiles Utilizing mm-Wave FMCW SAR Imaging
J. Barowski1, D. Pohle1, T. Jaeschke1, N. Pohl1, R. Rolle1, 1Ruhr-University Bochum, Bochum, Germany, 2Ruhr-University Bochum, Bochum, Germany, 3Purdue University, West Lafayette, United States, 4European Space Agency, Noordwijk, Netherlands
10:50h - 11:00h
Welcome Address
Opening of the European Radar Conference 2015
Laurent Ferro-Famil, EuRAD 2015 Chair
Michèle Lalande, EuRAD 2015 TPC Chair

11:00h - 11:45h
Breakthroughs and new concepts in SAR and radar
Marc Lesturgie, ONERA, Paris, France

During the last ten years, the radar community has been facing new requirements in civilian and military radar surveillance, requiring innovative radar techniques and architectures to improve the quality of detection, terrain imaging, target tracking, personal inspection, as well as the classification and identification of objects. Beside pure technological development requiring heavy investments and a long term planning, a new way of radar thinking has emerged from recent research and studies carried by the worldwide community, on the borders of different areas: communications for new waveform design, new SAR modes, innovative MIMO strategies, cognitive techniques for optimal radar scheduling, information theory and image processing for classification purpose, etc.

This presentation will outline most of the innovating techniques studied by the radar engineering community, in relation with their operational or commercial value. This overview will come with a state of art example of results and equipments, with a focus on the possible association between technology and potential operational benefits and a discussion on challenges to take up in the coming decades.

11:45h - 12:30h
Geosynchronous Synthetic Aperture Radars: systems and applications
Fabio Rocca, Politecnico di Milano, Milano, Italy

A swarm of N SAR sensors in a geostationary orbit might provide all-day-all-weather imaging within a continental region, using direct downloading for real time data exploitation.

The coherent combinations of the echoes would improve the signal-to-noise ratio by a factor of N^2, leading to metric resolution, 20-40 minutes minimum observation time, multi-polarimetric and interferometric imaging. Fast evolving events like landslides, floods, soil moisture changes, volcanic activity, co-seismic motions, infrastructure deformations and columnar water-vapor maps would be monitored continuously from space for the first time. The observed area would have a footprint up to a thousand kilometers wide, set using electronic steering, anytime, and anywhere within the continent. The flexibility of the swarm, of the SAR configurations, and of the observation parameters could be used to customize the system for each application. Risks, associated with clutter, troposphere and ionosphere propagation as well as the system capabilities are evaluated.
## WEDNESDAY

**EuMC25**  
**Microwave Applications of Metamaterials**  
Chair: Tasuo Itoh, UCLA  
Co-Chair: Amr Safwat, Faculty of Engineering, Ain Shams University

**EuMC26**  
**Passive Power Dividers**  
Chair: Jan Machac, Czech Technical University in Prague  
Co-Chair: Luca Perregrini, University of Pavia

**EuMC27**  
**Microwave Systems**  
Chair: Andreas Stebler, Johannes Kepler University  
Co-Chair: Steve Nightingale, Cobham

### EuMC25-01
**Demonstration of Circularly-Polarized Leaky-Wave Antenna Based on Pseudo-Traveling Wave Resonance**  
K. Ninomiya, T. Ueda, A. Porokhnyuk, T. Itoh, Kyoto Institute of Technology, Kyoto, Japan, University of California, Los Angeles, Los Angeles, United States

### EuMC26-01
**A Novel Gysel Power Divider Based on Substrate-Integrated-Waveguide (SIW) Technology**  
H. Chen, W. Cha, C. Gu, W. Feng, Nanjing University of Science & Technology, Nanjing, China

### EuMC27-01
**Exploitation of Capacitive Coupling at UHF for Remote Sensing in a kW WPT System**  
R. Trevisan, A. Costanzo, University of Bologna, Bologna, Italy, IMA SpA, Ozzano dell’Emilia, Italy

### EuMC25-02
**Epsilon Near Zero Loaded Magnetrons, Design and Realization**  
N. Nasr Esfahani, K. Schinemann, D. Vanvri, Technische Universität Hamburg-Harburg (TUHH), Hamburg, Germany, Institute of Radio Astronomy of NASU, Kharkov, Ukraine

### EuMC26-02
**Air-Bridge Free Coplanar Waveguide Power Divider**  
A. M. Nasef, A. M. Safwat, Faculty of Engineering, Ain Shams University, Cairo, Egypt

### EuMC27-02
**Mini Electromagnetic Pulse Generator Based on Switched Quarter-wavelength Oscillator**  
D. Jiang, B. Zhang, Y. Wang, 29th Institute of the Electronic Science and Technology group company of China, Chengdu, China

### EuMC25-03
**Active Diplexer Based on Isolation Circuits Imbedded Low Noise Amplifiers**  
H. Lee, S. H. Choi, T. Itoh, University of California at Los Angeles, Los Angeles, United States, Syracuse University, Syracuse, United States

### EuMC26-03
**E-plane 3-dB Power Divider/Combiner in Substrate Integrated Waveguide Technology**  
P. Pasian, L. Silvestri, M. Bozzi, L. Perregrini, K. K. Samanta, University of Pavia, Pavia, Italy, MILMega, Ltd, Ryde, United Kingdom

### EuMC27-03
**Bi-Partition Based Analog Beamforming for Millimeter Wave Backhaul Systems**  
R. Liu, T. Li, R. Long, X. Li, L. Wang, W. Cheng, Huawei, Chengdu, China, Sichuan University, Chengdu, China, China Mobile, Beijing, China

### EuMC25-04
**Metapaper: a Frequency Selective Surface Wallpaper for the Attenuation of Wi-Fi Signals**  
A. Niembro-Martín, E. De Barros, P. Lemaitre-Auger, G. Eymir-Petot-Tourtelle, E. Pistono, T. Vuong, Centre Technique du Papier, Grenoble, France, University of Grenoble-Alpes, Valence, France, University of Grenoble-Alps, Grenoble, France

### EuMC26-04
**Four-way Waveguide Power Dividers with Integrated Filtering Functions**  
A. M. Mohammed, Y. Wang, University of Greenwich, Chatham, United Kingdom

### EuMC27-04
**A Widely Nonlinear Approach to Compensate Impairments in I/Q Modulators**  
C. Crespo-Cadenas, M. J. Madero-Ayora, J. A. Becerra-Gonzalez, University of Seville, Seville, Spain
EuMC28-01 Millimetre Wave Transmitter Based on a Technology Graphene Frequency Multiplier
C. Vázquez Antuña, A. I. Hadarig, S. Ver Hoeve, R. Cambior Diaz, M. Fernández Garcia, G. R. Hotopan, L. Alonso González, F. Las Heras Andrés, University of Oviedo, Gijón, Spain

EuMC28-02 GaN Based Wideband T/R Module for Multi-Function Applications
R. Reger, A. Klaassen, P. Schuh, M. Oppermann, Airbus Defence and Space, Ulm, Germany

EuMC28-03 Compact Transponder Front-End with Enhanced Gain for Electronic Toll Collection at 5.8 GHz
S. Maddio, A. Cidronali, G. Collodi, G. Manes, MIDRA - University of Florence, Florence, Italy

EuMC28-04 Design and Realisation of a pHEMT Diode MMIC Power Limiter using 3D GaAs Multilayer CPW Technology
P. B. Kyabaggu, N. Haris, A. Reza, A. Velazquez, The University of Manchester, Manchester, United Kingdom

EuMC28-05 Characterization of the Six-port Interferometer Demodulator through Mixer Modeling
J. Moghadassi, K. Wang, K. Wu, Poly-Grames Research Center, Center for Radifrequency Electronics Research of Quebec (CEREP), Ecole Polytechnique (University of Montreal), Montreal, Canada

EuMC28-09 Application of Aggressive Space Mapping (ASM) to the Automated Design of Differential-Mode Wideband Bandpass Filters with Common-Mode Suppression
M. Sans, J. Selig, P. Weier, A. Rodrigues, J. Bonache, V. E. Botto, F. Martin, University Autonoma de Barcelona, Bellaterra, Spain, Universitat Politecnica de Valencia, Valencia, Spain

EuMC29-01 A Lens-Coupled 210-270 GHz Circularly Polarized Microwave Transceiver Module in SiGe Technology
K. Statnikov1, J. Gryzi1, N. Sarmah1, B. Heinemann1, U. R. Pfeiffer2, University of Wuppertal, Wuppertal, Germany, 1HP, Frankfurt (Oder), Germany

EuMC29-02 A Compact W-band LFM CW Radar Module with High Accuracy and Integrated Signal Processing
C. Zech1,4, A. Hülsmann1, M. Schlechtweg1, S. Reinold2, C. Giers2, R. van Kemenade1, C. Juranek2, R. Finger3, B. Smolders3, L. Bronfman3, University of Applied Sciences of Wuppertal, Wuppertal, Germany, Fraunhofer Institute for Reliability and Microintegration (IZM), Berlin, Germany, University of Frascati, Frascati, Italy

EuMC30-01 A 20 Gbit/s, 280 GHz Wireless Transmission in a 20 Gbit/s, 280 GHz Circularly Polarized A 20 Gbit/s, 280 GHz Microwave Transmitter
C. Ghani, S. Lutz, L. Köhler, H. Martz, T. Walter, R. Weigel, University of Applied Sciences Ulm, Ulm, Germany, Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen, Germany

EuMC30-02 A 20 Gbit/s, 280 GHz Wireless Transmission in an InP/HEMT Based Receiver Module Using Flip-Chip Assembly
Y. Kawano, H. Matsumura, S. Shiba1, M. Sato, T. Suzuki, Y. Nakasha2, T. Takahashi2, K. Makiyama1, T. Iwai2, N. Hara, NTT, Japan, Fujitsu Ltd., Atsugi, Japan, Fujitsu Laboratory Ltd., Atsugi, Japan

EuMC30-03 A 20 Gbit/s, 280 GHz Wireless Transmission in an InP/HEMT Based Receiver Module Using Flip-Chip Assembly
Y. Kawano, H. Matsumura, S. Shiba1, M. Sato, T. Suzuki, Y. Nakasha2, T. Takahashi2, K. Makiyama1, T. Iwai2, N. Hara, NTT, Japan, Fujitsu Ltd., Atsugi, Japan, Fujitsu Laboratory Ltd., Atsugi, Japan

EuMC30-04 A 20 Gbit/s, 280 GHz Wireless Transmission in an InP/HEMT Based Receiver Module Using Flip-Chip Assembly
Y. Kawano, H. Matsumura, S. Shiba1, M. Sato, T. Suzuki, Y. Nakasha2, T. Takahashi2, K. Makiyama1, T. Iwai2, N. Hara, NTT, Japan, Fujitsu Ltd., Atsugi, Japan, Fujitsu Laboratory Ltd., Atsugi, Japan

EuMC30-05 Surface Velocity Estimation of Fluids using Millimetre-Wave Radar
C. Erfurt1, S. Lutz1, J. Köhler1, H. Martz1, T. Walter1, R. Weigel2, University of Applied Sciences Ulm, Ulm, Germany, Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen, Germany

EuMC31-01 A Broadband 240 GHz Lens-Integrated Polarization-Diversity On-Chip Circular Slot Antenna for a Power Source Module in SiGe Technology
J. Gryzi1, K. Statnikov1, N. Sarmah1, U. Pfeiffer2, University of Wuppertal, Wuppertal, Germany

EuMC31-02 Broadband High Gain SW Ring Slot Antenna
Z. Shen1, K. Dhwaj1, H. Lee1, L. Jiang2, T. Itoh3, ‘Microwave Electronics Laboratory, Los Angeles, United States, 1Electromagnetics and Optics Laboratory, Hong Kong, China

EuMC31-03 SIW Slot Antenna for E-Band Communications
D. Zelenchuk1, V. Fusco1, J. Breslin2, M. Kaveneye1, ‘Queen’s University of Belfast, Belfast, United Kingdom, 2Analogue Devices Inc, Limerick, Ireland

EuMC31-04 Digital Interference in Millimetre Integrated Antennas
H. H. Yordanov1, G. Savov1, V. Poulkov1, B. Audjikij2, ‘Technical University of Sofia, Sofia, Bulgaria, ‘RaySat BG, Sofia, Bulgaria

EuMC31-05 Digital Interference in Millimetre Integrated Antennas
H. H. Yordanov1, G. Savov1, V. Poulkov1, B. Audjikij2, ‘Technical University of Sofia, Sofia, Bulgaria, ‘RaySat BG, Sofia, Bulgaria
WEDNESDAY

EuMC Poster01 Session
Chair: Jean-François Villemazet, Thales Alenia Space
Co-Chair: Denis Barataud, XUM
12:30h - 14:10h
The authors are present for discussion from 12:30h - 14:10h

EuMC Poster02 Session
Chair: Jean-François Villemazet, Thales Alenia Space
Co-Chair: Denis Barataud, XUM
12:30h - 14:10h
The authors are present for discussion from 12:30h - 14:10h
WEDNESDAY

EuMC Poster03 Session
Chair: Jean François Villenaert, Thales Alenia Space
Co-Chair: Denis Barataud, XUM
12:30h - 14:10h
The posters are on display from 12:30h - 14:10h
The authors are present for discussion from 12:30h - 14:10h
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<td>EuMC32   Linear and Nonlinear Modelling Techniques</td>
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<td>Chair: Anthony Ghotto, University of Bordeaux</td>
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<td>Co-Chair: Alessandro Galli, La Sapienza Università di Roma</td>
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<tr>
<td>14:10h - 14:30h</td>
<td>EuMC33   Integrated Antenna Technologies</td>
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<tr>
<td></td>
<td>Chair: Jozef Modelski, Warsaw University of Technology</td>
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<td>Co-Chair: Manos Tentzeris, Georgia Institute of Technology</td>
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<tr>
<td>14:30h - 14:50h</td>
<td>EuMC34   Non-linear Measurements and Models</td>
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<td>Chair: Patrick Gamand, NXP</td>
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<td>Co-Chair: Fabio Filicori, Univ. of Bologna</td>
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<tr>
<td>14:50h - 15:10h</td>
<td>EuMC35   Focus Session on Advance in Scanning Probe Microscopy and mm-wave Microscopy</td>
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<td>Chair: Marco Farina, Università Politecnica dell Marche</td>
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<td>Co-Chair: Alexander Tsieleu, Oak Ridge National Laboratory</td>
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**Wednesday**

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<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>13:50h - 14:10h</td>
<td>EuMC32-01 A Hybrid FEBS-MoM-PO Formulation for the Analysis of Radiation and Scattering Problems</td>
</tr>
<tr>
<td></td>
<td>K. Zhao, L. Peterson, ANSYS, Inc., Canonsburg, United States</td>
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<tr>
<td>14:10h - 14:30h</td>
<td>EuMC32-02 Fast Near-Field Antenna Measurement Technique</td>
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<tr>
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<td>P. I. Chu, D. C. Tsai, Z. M. Tsai, National Chung Cheng University, Chiai, Taiwan</td>
</tr>
<tr>
<td>14:30h - 14:50h</td>
<td>EuMC32-03 A Fully Printed Multilayer Aperture-Coupled Patch Antenna Using Hybrid 3D / Inkjet Additive Manufacturing Technique</td>
</tr>
<tr>
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<td>K. Nata, J. Hester, M. Isakov, R. Bah, M. Tentzeris, Georgia Institute of Technology, Atlanta, United States</td>
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<tr>
<td>14:50h - 15:10h</td>
<td>EuMC32-04 Adaptive Sampling Method for Fixed-Grid Variables in Measurements of Nonlinear Active Devices</td>
</tr>
<tr>
<td></td>
<td>P. Barmuta1, F. Ferranti3, A. Lewandowski2, K. Nate, J. Hester, M. Isakov, R. Bah, M. Tentzeris, Georgia Institute of Technology, Atlanta, United States</td>
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<tr>
<td>15:10h - 15:30h</td>
<td>EuMC32-05 Lowering the Threshold for Bistability</td>
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<td>A. Y. Nimetz, D. M. Xavrin, Institute of Radio Astronomy of NAS of Ukraine, Kharkov, Ukraine</td>
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<tr>
<th>Time</th>
<th>Session</th>
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<tr>
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<td>EuMC33-01 A Fully Printed Multilayer Aperture-Coupled Patch Antenna Using Hybrid 3D / Inkjet Additive Manufacturing Technique</td>
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<td>K. Nata, J. Hester, M. Isakov, R. Bah, M. Tentzeris, Georgia Institute of Technology, Atlanta, United States</td>
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<tr>
<td>14:10h - 14:30h</td>
<td>EuMC33-02 X Band Tunable Slot Antenna With Graphene Patch</td>
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<tr>
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<td>A. Bureau1, D. Neculoiu1, M. Dragon2, G. Konstantinidis1, G. Deligeorgis1, IMT Bucharest, Bucharest, Romania, FORTH Heraklion, Heraklion, Greece</td>
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<tr>
<td>14:30h - 14:50h</td>
<td>EuMC33-03 Adaptive Sampling Method for Fixed-Grid Variables in Measurements of Nonlinear Active Devices</td>
</tr>
<tr>
<td></td>
<td>P. Barmuta1, F. Ferranti3, A. Lewandowski2, K. Nate, J. Hester, M. Isakov, R. Bah, M. Tentzeris, Georgia Institute of Technology, Atlanta, United States</td>
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<tr>
<td>14:50h - 15:10h</td>
<td>EuMC33-04 X-Band Frequency Agile Antenna Coupled to RF Interferometry</td>
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<td>A. Cunzhet2, A. Ghotto1, M. Potereau1, M. De Mata1, S. Fregones1, E. Kerkhove1, T. Zimmer1, Univ. Bordeaux, Talence, France, Advinch, Meirieux, France</td>
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<tr>
<td>15:10h - 15:30h</td>
<td>EuMC33-05 DOO Behavioral Model Extraction Setup Using Uncorrelated Envelope Signals</td>
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<td>H. Zargar1, A. Banaei1, J. C. Pedro1, Sharif University of Technology, Tehran, Iran, Aveiro University, Aveiro, Portugal</td>
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<tr>
<td>15:30h - 16:10h</td>
<td>EuMC34-01 Nonlinearity Measurement and Analysis of 0.25 um GaAs HEMT Over Frequency and Temperature using Two-Tone Intermodulation Distortion</td>
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<td></td>
<td>M. A. Aalm1, A. A. Rezazadeh1, M. A. Al1, P. B. Kybaboglu1, N. Haris1, C. Gaquer1, The University of Manchester, Manchester, United Kingdom, University of Lille, Lille, France</td>
</tr>
<tr>
<td>16:10h - 16:30h</td>
<td>EuMC34-02 Transmission and Reflection Mode Scanning Microwave Microscopy (SSMM): Experiments, Calibration and Simulations</td>
</tr>
<tr>
<td></td>
<td>P. F. Pedersen, A. L. Schodde1, T. Lascu1, M. Kaspar1, A. Olszewski1, J. H. Rees1, F. Poggi1, R. Mansfield1, J. Kuehner1, Keysight Technologies Austria GmbH, Lisa, Austria, COM, Rome, Italy, US, Lisa, Austin, TX, United Kingdom, Keysight Technologies, Santa Rosa, United States, WU, Lille, Austria, University College London, London, United Kingdom</td>
</tr>
<tr>
<td>16:30h - 16:50h</td>
<td>EuMC34-03 Early Demonstration of a High VSWR Microwave Coaxial Programmable Impedance Tuner with Fixed-Grid Variables in Measurements of Nonlinear Active Devices</td>
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<td>A. Cunzhet2, A. Ghotto1, M. Potereau1, M. De Mata1, S. Fregones1, E. Kerkhove1, T. Zimmer1, Univ. Bordeaux, Talence, France, Advinch, Meirieux, France</td>
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<tr>
<td>16:50h - 17:10h</td>
<td>EuMC34-04 High Performance Microwave Coaxial Programmable Impedance Tuner with Fixed-Grid Variables in Measurements of Nonlinear Active Devices</td>
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<tr>
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<td>A. Cunzhet2, A. Ghotto1, M. Potereau1, M. De Mata1, S. Fregones1, E. Kerkhove1, T. Zimmer1, Univ. Bordeaux, Talence, France, Advinch, Meirieux, France</td>
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<tr>
<td>17:10h - 17:30h</td>
<td>EuMC34-05 Imaging of Biological Structures by Near-Field Microwave Microscopy</td>
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<td>M. Farina1, D. Di Donato1, D. Marcelli2, G. Venanzoni1, A. Morini1, P. Pietrasanta1, Università Politecnica delle Marche, Ancona, Italy, Università “G. D’Annunzio”, Chieti, Italy</td>
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**WEDNESDAY**

**45th Conference**

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<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>13:50h - 14:10h</td>
<td>EuMC32   Linear and Nonlinear Modelling Techniques</td>
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<td>Chair: Anthony Ghotto, University of Bordeaux</td>
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<tr>
<td>15:10h - 15:30h</td>
<td>EuMC36   Nanoscale Scanning Probe Microscopy on Advanced Functional Materials</td>
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<td></td>
<td>Y. Ren, D. Wu, X. Wu, Y. Liu, K. Lai, University of Texas at Austin, Austin, United States</td>
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WEDNESDAY

**EuMC39**
Digital Beamforming and MIMO Antennas
Co-Chair: Marco Pesin, University of Pavia

**EuMC40**
Microwave Measurement Methods and Material Characterization
Chair: Nikolay Cherpak, IRE NAS of Ukraine
Co-Chair: Luca Perregrini, Univ of Pavia

**EuMC41**
SIW Filters and Related Structures
Chair: Xi Wu, Polytechnique de Montreal
Co-Chair: Ferran Martin, Universitat Autonoma de Barcelona

**EuMC42**
Hyperthermia Applications
Chair: Jan Ivba, Czech Technical University
Co-Chair: Dominique Schreurs, KU Leuven

**EuMC39-01**
Microwave Phased Array Digital Beamforming System Design Challenges for SKA

**EuMC39-02**
Asymmetrical Coplanar Waveguide Zeroth-Order Resonant Antenna with Extended Bandwidth
Y. He, F. Tan, C. Liu, Sichuan University, Chengdu, China

**EuMC39-03**
Dual Polarized Circular Array Antenna for PCL System and Possibility of Digital Beamforming of an Antenna Pattern
P. Piascik, M. Gantzold, Pit-Radwar S.A., Warsaw, Poland

**EuMC40-01**
Comparison of Methods for Measurement of Equivalent Source Match
I. P. Hoffmann, M. Wollensock, J. Riedel, M. Ziehe, Federal Institute of Metrology METAS, Bern-Wabern, Switzerland

**EuMC40-02**
Optimized Method for Achieving Accurate Signals for “True-Mode” S-Parameter Measurements
M. Schramm1, M. Hobalek1, J. Schur1, L. Schmidt1, M. Konrad1, Konrad Technologies, Radolfzell, Germany, 2Ferdinand-Braun-Institut (FBH), Leibniz-Institut fuer Hochfrequenztechnik, Berlin, Germany, 3University Erlangen-Nuremberg, Erlangen, Germany

**EuMC40-03**
Q-factor Change of Cavity by Sample Installation in Resonance Perturbation Method
T. Murai1, K. Tahara1, J. Sugiyama1, M. Horibe1, The Mueller Consultant, Suginami, Japan, 2Kanto Electronics Application and Development Inc., Kunitachi, Japan, 3National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan

**EuMC40-04**
RF Characterization of 3D Printed Flexible Materials - NinjaFlex Filaments
R. A. Bahri1, I. Leu1, S. Moscatolo1, M. Pesiani1, M. Bozzi1, L. Perregini1, M. M. Tentzeris2, Georgia Institute of Technology, Atlanta, Georgia, 3University of Pavia, Pavia, Italy

**EuMC41-01**
Quasi-Elliptic SIW Band-Pass Filter Based on Mushroom-Shaped Resonators
C. Tomassoni1, L. Silvestri1, M. Bozzi1, L. Perregini1, University of Pavia, Pavia, Italy, 2University of Pavia, Pavia, Italy

**EuMC41-02**
Substrate Integrated Waveguide Diplexer with Dual-Mode Junction Cavity
Z. Kordbourezij, J. Bornemann, University of Victoria, Victoria, Canada

**EuMC41-03**
Design of a Surface Mounted Waveguide Filter in Substrate Integrated Waveguide Technology
J. Schone1, J. Bornemann1, U. Rosenberg2, 1University of Victoria, Victoria, Canada, 2University of Pavia, Pavia, Italy

**EuMC41-04**
Low-Loss Air-Filled Substrate Integrated Waveguide (SIW) Band-Pass Filter with Inductive Posts
F. Parment1, A. Ghiotto2, T. Vuong1, J. Duchamps1, K. Wu1, Universite de Grenoble-Alpes, Grenoble, France, 2University of Bordeaux, Bordeaux, France, 3Poly-Grames Research Center, Montreal, Canada

**EuMC42-01**
Development of a 27.12 MHz CC-LCF Intrauminal Applicator for Hyperthermia of the Esophagus
J. Crezee, H. J. Harms, H. J. Boluijt, J. Sijbrands, M. C. Hulshof, H. P. Kok, Academic Medical Center, Amsterdam, Netherlands

**EuMC42-02**
Modular Planar Antenna Array for Breast Hyperthermia Treatment
O. Forer, I. Merunka, J. Ivba, Czech Technical University in Prague, Prague, Czech Republic

**EuMC42-03**
SAR Distribution Evaluation Method for Hyperthermia
I. Merunka, O. Forer, J. Ivba, Czech Technical University in Prague, Prague, Czech Republic

**EuMC42-04**
A Mixed Frequency Approach to Optimize Locoregional RF Hyperthermia
H. P. Kok, G. van Stam, A. Bel, J. Crezee, Academic Medical Center, Amsterdam, Netherlands
Hotel Booking Form 2015

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.

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Or complete the booking form below and fax to +44 (0)2380 051113

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 shows/late cancellation charges, as stipulated in the booking confirmation will be charged to this credit card.

Signed ____________________________________________ Date: _____________________
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<th><strong>Headquarters Hotel</strong></th>
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<tbody>
<tr>
<td>**** Hyatt Regency Paris Étoile</td>
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<tr>
<td>3, Place du Général Kœnig, Paris, 75017</td>
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<tr>
<td>• Onsite at the Palais des Congress</td>
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<tr>
<td>Prepay Rates from €215.00</td>
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<tr>
<td>Flexible Rates from €268.00</td>
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<td><strong>Special event rate rates from €199.00 including Breakfast and VAT – only available via this booking form</strong></td>
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<td>155 Avenue De Malakoff 75116 Paris</td>
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<td>• 4 minute walk to EuMW</td>
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<td>3 Rue Pergolese 75116 Paris</td>
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<td>• 7 minute walk to EuMW</td>
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<td>Flexible Rates from €201.00</td>
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<th>**** AC Hotel Paris Porte Maillot By Marriot</th>
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<td>6 Rue Gustave Charpentier 75017 Paris</td>
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<tr>
<td>• 8 minute walk to EuMW</td>
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<tr>
<td>Prepay Rates from €207.00</td>
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<tr>
<td>Flexible Rates from €245.00</td>
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<tr>
<td>• 13 minute walk to EuMW</td>
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<tr>
<td>Flexible Rates from €156.00</td>
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<td>• 13 minute walk or 16 minutes by Metro to EuMW</td>
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<td>Prepay Rates from €207.00</td>
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<td>• 9 minute walk or 8 minutes by Metro to EuMW</td>
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<td>• 11 minute walk or 11 minutes by Metro to EuMW</td>
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<td>10 rue arc de triomphe 75017 Paris</td>
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<td>• 14 minute walk or 11 minutes by Metro to EuMW</td>
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<td>10 Avenue Mac Mahon , 75017 Paris</td>
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<td>• 15 minute walk or 10 minutes by Metro to EuMW</td>
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<td>Prepay Rates from €163.00</td>
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<td>Flexible Rates from €173.00</td>
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<td>24 Rue de Tilsitt 75017 Paris</td>
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<td>• 12 minute walk or 10 minutes by Metro to EuMW</td>
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<td>Prepay Rates from €128.00</td>
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<td>Flexible Rates from €138.00</td>
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<tr>
<td>• 17 minute walk or 25 minutes by Metro to EuMW</td>
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<td>Flexible Rates from €127.00</td>
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EuRAD03  | Focus Session on 3D SAR Imaging of Complex Environments  
Chair: Stefano Tebaldini, Politecnico Di Milano  
Co-Chair: Xiao Xiang Zhu, Technical University of Munich

EuMC/EuRAD04  | Feeds, Wideband and Multi Band Antennas  
Chair: Alexandru Takacs, University of Toulouse  
Co-Chair: Jean-Yves Dauvignac, University of Nice

EuMC/EuRAD05  | Printed Antennas  
Chair: Raphael Gillard, INSA Rennes  
Co-Chair: Milan Polivka, Czech Technical University in Prague

EuRAD03-01  | Tomographic Profiling of the Structure of a Snow Pack at X-/Ku-Band using SnowScat in SAR Mode  
O. Frey1,2, C. Werner1, A. Wiesmann1,  
1Gamma Remote Sensing, Gümligen, Switzerland, 2ETH Zurich, Zurich, Switzerland

EuMC/EuRAD04-01  | The Yagi-Helix: a Multi-Director Configuration for the Backfire-Helix Antenna  
C. Culotta-López1, K. Schraml1, R. Wilke1, D. Heberling1, RWTH Aachen, Aachen, Germany

EuMC/EuRAD05-01  | An Active Three-Dimensional GPS Patch Antenna Using MID-Technology  
A. Friedrich1, L. Berkemann1, T. Martineili1, B. Geck2, O. Klemp2, I. Kriebitzsch2, Leibniz Universität Hannover, Hannover, Germany,  
BMW Group, München, Germany

EuRAD03-02  | Sparse Reconstruction Automaton for Synthetic Aperture Radar Tomography  
N. Ge1, X. Zhu2,1, 1German Aerospace Center (DLR), Wessling, Germany, 2Technische Universität München, Munich, Germany

EuMC/EuRAD04-02  | Dual Polarized Monopulse Tracking Feed for Prime Focal Reflector Antenna at S-band using Crossed Dipoles  
V. K. Panasa1, R. Chivukula1, S. Kumar1, S. B. Sharma1, 1Larsen and Toubro Ltd, Mumbai, India, 2Indus University, Ahmadabad, India

EuMC/EuRAD05-02  | Orbital Angular Momentum Mode Multiplexing with Half-Mode Substrate Integrated Waveguide Antenna  
Y. Chen, S. Zheng, H. Chi1, X. Jin, X. Zhang, Zhejiang University, Hangzhou, China

EuRAD03-03  | A Comparative Study of Tomographic SAR Focusing Methods  
A. Reigber1, M. Nannini1, A. Martinez del Hoyo1, G. Martín del Campo Becerra2, German Aerospace Center (DLR), Oberpfaffenhofen, Germany

EuMC/EuRAD04-03  | Design of a Multiband Microstrip Patch Antenna with Defected Ground Structures (DGS)  
M. A. Belen1, A. Caliskan1, P. Mahouti2, S. Demirel3, F. Günes1, Yıldız Technical University, Istanbul, Turkey

EuMC/EuRAD05-03  | Circularly Polarized Isoflux Compact X Band Antenna for Nano-Satellites Applications  
J. Fouany1, M. Thevenot1, E. Arnaud1, T. Morescalier1, N. Adnet1, R. Manrique1, L. Duchesne1, J. Baracchi2, K. Elia1, 1Xlim, University of Limoges, France, 2Agency for Assessment of Climate Policy and Industrial Quality, Bandung, Indonesia

EuRAD03-04  | Snowpack Characterization using SAR Tomography AlpSAR Campaign Experimental Results  
B. Rekikou1,2, M. Davy3, L. Ferro-Famil3, 1Ecole Militaire Polytechnique de Bordeaux, 2D tension, 3Université de Rennes 1, Rennes, France

EuMC/EuRAD04-04  | New Traveling-Wave Resonating Antenna based on Metamaterial for Wireless Communications  
M. Naser-Moghadasi1, M. Allahkabi-Kanari1, 1Science and Research Branch, Islamic Azad University, Tehran-Iran, Tehran, Iran, 2Shahid Bahonar University of Kerman, Iran, Kerman, Iran

EuMC/EuRAD05-04  | Multiband Printed Antenna Composed of an Array of Split Ring Resonators  
A. Munir1, J. Soba2, 1Institut Teknologi Bandung, Bandung, Indonesia, 2Agency for Assessment of Climate Policy and Industrial Quality, Bandung, Indonesia

EuRAD03-05  | 3D Imaging of an Alpine Glacier: Signal Processing of Data from the AlpToMoSAR Campaign  
S. Tebaldini1, F. Rocca1,2, A. Meta1, A. Coccia1, 1Politecnico di Milano, Milan, Italy, 2MetaSensing, Leiden, Netherlands

EuMC/EuRAD04-05  | Efficient Tapered Dielectric Image Line Antenna in Planar Structure  
C. S. Prasad1, A. Biswas1, Indian Institute of Technology Kanpur, Kanpur, India

EuMC/EuRAD05-05  | Dual Orthogonal CPW Feed Single Element UWB Antenna with Polarization Diversity  
G. S. Reddy1, K. Chhabilwad2, S. Kharce1, P. Patel1, J. Mulherjee1, IIT Bombay, Mumbai, India
EuMC43
Advanced Packaging and Interconnects
Chair: Jean-François Villaznez, Thales Alenia Space
Co-Chair: Wolfgang Heinrich, Ferdinand-Braun-Institut (FBH)

EuMC44
Wide-band, Multi-band and Multi-Mode Planar Filters
Chair: Giuseppe Macchiarella, Politecnico di Milano
Co-Chair: Roberto Gómez, Universidad Alcalá de Henares

EuMC45
Biosensors
Chair: Katri Grenier, LAAS-CNRS Toulouse
Co-Chair: R. Jacoby, TU Darmstadt

EuMC46
THz Components
Chair: Jan Stake, Chalmers University of Technology
Co-Chair: Viktor Krozer, Goethe-Universität Frankfurt

EuMC43-01
Grooved Laminated Waveguide Devices for Packaging, and D-band Applications
C. Kämfelt, P. Coant, M. Sinou, J. Coupez, D. Bourreau, A. Péden, Télécom Bretagne Institut Mines Télécom, Lab-Sticc UMR 6285, Brest, France

EuMC44-01
Balanced Filter Using Dual-mode Ring Resonators
W. Feng; W. Che; Q. Xue, ‘Nanjing University of Science & Technology, Nanjing, China’ City University of Hong Kong, Hongkong, China

EuMC45-01
Dual-Purpose Microwaves Application: Blood Sensing and Self-Blood Treatment
K.A. Ahnoglo; A. V. Nozhatov; T. S. Krozov; A. I. Fain, M. Nihonved, V. O. Malakhov, ‘N.Y. Kurlov Institute for Radio-Physics and Electronics NASU, Kharkiv, Ukraine, Kharkiv Medical Academy of Post-Graduate Education (KHMAE), Kharkiv, Ukraine, Yalta City Choral Hospital No. 7, Kharkiv, Ukraine,’.J. Guntul’gy Eurasian National University, Astana, Kazakhstan

EuMC43-02
Wideband RF Interconnects for Organic Chip Packages
F. K. Rühf, W. Bogner, J. Jakobi, D. Hageneder, ‘THD Technische Hochschule Deggendorf, Deggendorf, Germany, Rohde und Schwarz GmbH & Co., Tisnach, Germany

EuMC44-02
Dual-Wideband BPF Consisting of a Parallel-Coupled SIR and Open-Ended Stubs with Transmission Zeros
C. Chen, N. Kato, ’A. And, S. Akefadi, Z. Me, ‘Nagauchi University, Yokohama, Japan,’ Antennna Giken Co., Ltd., Saitama, Japan,’ Saitama University, Saitama, Japan

EuMC45-02
K-band BiCMOS Based Near-Field Biomedical Dielectric Sensor for Detection of Fat and Calcium in Blood
F. Jamal, S. Guha, M. Eissa, S. Vehring, C. Meiani, HP - Innovations for High Performance Microelectronics, Frankfurt (Oder), Germany

EuMC43-03
An Advanced Transmit/Receive 3D ceramic Hybrid Circuit Module for Space Applications
A. Fina, L. Di Marcantonio, A. Suriani, A. Orlandi, P. Rognolati, G. Mannocchi, Thales Alenia Space Italia, L’Aquila, Italy, ‘Università degli Studi di L’Aquila, L’Aquila, Italy

EuMC44-03
Design of a Triband Lumped Element Filter for Digital Microwave Power Amplifiers
M. Martinez Mendoza, A. Wentzel, A. Alvarez Melcon, W. Heinrich, Ferdinand Braun Institut (FBH), Berlin, Germany, ‘Università Politecnica Cartagena, Cartagena, Spain

EuMC45-03
Conformal mm-Wave Antennas for Catheter embedded Atherosclerotic Plaque Sensors
G. Notzoi, C. Baer, T. Muschi, C. Dhahf, I. Rollens, ‘Institute of Electronic Circuits, Ruhr-University Bochum, Bochum, Germany,’ Institute of Microwave Systems, Ruhr-University Bochum, Bochum, Germany

EuMC43-04
A 5.4W X-Band Gallium Nitride (GaN) Power Amplifier in an Encapsulated Organic Package
S. Pavlidis, A. C. Ulusoy, J. Papapolymerou, Georgia Institute of Technology, Atlanta, United States

EuMC44-04
Design of High-Selectivity Microstrip Bandpass Filter Using Triple-Mode Stub Loaded Resonator
A. K. Gorzo, M. Ema, C. Karpuz, A. Ozan, Nevsehir Haci Bektas Veli University, Nevsehir, Turkey, ‘Pamukkale University, Denizli, Turkey

EuMC45-04
Parametric Study of a Microwave Sensor Dedicated to the Dielectric Spectroscopy of Single Cells and Biological Cells
W. Chen, D. Dubuc, K. Grenier, LAAS-CNRS and Toulouse Univ., Toulouse, France

EuMC43-05
Plastic Packaged E-mode Transistors to 50 GHz with Integrated ESD Protection and Bias Control
H. Morkoç, A. Riddel, MACOM Technology Solutions, Lowell, United States

EuMC44-05
Modified Split-Ring Resonator for Microstrip Dual-Band Notch Filter
J. Himijossai, F. Martinez-Viviente, J. Ruiz, A. Alvarez Melcon, ‘Universidad Politécnica de Cartagena, Cartagena, Spain,’ Universidad Politécnica de Cartagena, Cartagena, Spain

EuMC45-05
Parallelization of Dielectric Measurements at Microwaves for Microfluidic Biosensor Arrays
M. Schiiller, M. Puente, R. Jakoby, D. Dubuc, K. Grenier, ‘TU Darmstadt, Darmstadt, Germany,’ ‘LAAS CNRS, Toulouse, France’

EuMC46-01
1.9-3.2 THz Schottky Based Harmonic Mixer Design and Characterization
B. Stak, N. S. Barker, ‘Virginia Diodes, Inc., Charlottesville, United States,’ Chalmers University of Technology, Gothenburg, Sweden

EuMC46-02
An Efficient 290 GHz Harmonic Oscillator in Transferred-Substrate InP-DHBT Technology
M. Hossain, K. Nosova, B. Janke, N. Weimann, O. Krüger, V. Krozer, W. Heinrich, Ferdinand-Braun-Institut, Berlin, Germany

EuMC46-03
A Dual-Output 550 GHz Frequency Tripler featuring Ultra-Compact Silicon Micromachining Packaging and Enhanced Power-Handling Capabilities

EuMC46-04
High Power LO Signals Generation for THz Multi-Pixel Array Receiver
X. Chen, W. Cui, X. Li, T. Hu, Z. Zhu, Z. Chen, J. Ge, ‘Xi’an Institute of Space Radio Technology, Xi’an, China,’ Nanjing University of Information Science & Technology, Nanjing, China

EuMC46-05
A Robust Waveguide Millimeter-Wave Noise Source

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**EuRAD04-01** Radar Detection for Non-Stationary Doppler Signal in one Burst on Information Geometry F. Barbareco, Thales Air Systems, Limours, France

**EuRAD04-02** Iterative Adaptive Approach for Unambiguous Wideband Target Detection N. Petrov, F. Le Chevalier, TU Delft, Delft, Netherlands

**EuRAD04-03** Robust Burg Estimation of Radar Scatter Matrix for Constrained Stationary SIRV A. Decurninge, F. Barbareco, Thales Air Systems, Limours, France

**EuRAD04-04** Single MLP-CFAR for a Radar Doppler Processor Based on the ML Criterion. Validation on Real Data. N. del-Rey-Maestre, D. Mota-Moya, P. Jarabo-Amores, P. Gomez-del-Hoyo, J. M. Martin-de-Nicolas, University of Alcala, Alcala de Henares, Spain

**EuRAD04-05** Simultaneous Air/Air and Air/Ground Radar Modes with a Single Antenna C. Endersi, M. Montecot, T. Silei, M. Schaub, Thales Systemes Aeroportes, Elancourt, France

**EuRAD05-01** Measuring Refractivity Profiles in the Marine Environment using Radiosondes Launched with a Pneumatic Line Thrower M. Meltzer, P. Oesterstad, A. Hedby, G. Norsvik, B. Saagseveen, Norwegian Defence Research Establishment, Kjeller, Norway, Royal Norwegian Navy Bergen, Norway

**EuRAD05-02** X-Band Avionic Weather Radar Simulator: Outputs Testing and Analysis E. Barcaroli, A. Lupidi, F. Cuccoli, L. Baldini, L. Facheris, RASS-CNT, Florence, Italy, CNR, Rome, Italy, University of Florence, Florence, Italy

**EuRAD05-03** Quantitative Analysis of Incoherent Polarmetric Decomposition Techniques for Weather Radar Data A. Lupidi, S. Lischi, F. Cuccoli, CNIT, Pisa, Italy

**EuRAD05-04** Three-Component Decomposition Based on Stokes Vector for Compact Polarmetric SAR under the CTLR Mode H. Wang, Z. Zhou, J. Turbbi, O. Song, F. Qi, National University of Defense Technology, Changsha, China, University of Birmingham, Birmingham, United Kingdom, University of Birmingham, Birmingham, United Kingdom

**EuRAD05-05** Analysis of Canonical Targets in Near Field for Forward Scatter Radar Applications M. T. Falconi, D. Comite, F. S. Manzano, A. Galli, P. Lombardo, Sapienza University of Rome, Rome, Italy

**EuRAD05-06** Analysis and Design of a Slotted Waveguide Antenna Array using Hollow Substrate Integrated Waveguide L. Jin, R. M. Lee, I. D. Robertson, University of Leeds, Leeds, United Kingdom

**EuRAD05-07** Design of a Scalable Phased Array Antenna with Simplified Architecture F. Albar, A. Mortazawi, University of Michigan-Aeron-Arbor, Ann Arbor, United States


**EuRAD05-09** Multi-beam Tapered Slot Antenna Array Using Substrate Integrated Waveguide Rotman Lens J. Troahmadaz, A. T. Derinishi, National Institute of Scientific Research (NIRS) Centre for Energy, Materials and Telecommunication, Montreal, Canada

**EuRAD05-10** Wide Angle Scanning Reconfigurable Beam Steering Antenna T. Sabapathy, M. Jusoh, M. Rammal, 1XLIM, Limoges, France, Thales Alenia Space – Italy, Rome, Italy, ESA estec, Noordwijk, Netherlands
EuMC47
Flexible Stretchable and Printed Technology
Chair: Dimitri Pavlidis, Boston University
Co-Chair: Henri Happy, University of Lille

EuMC48
Wireless Technologies
Chair: Andrew Gibson, University of Manchester
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EuMC49
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EuMC50
Emerging THz Technologies
Chair: Arnt Raisänen, Aalto University
Co-Chair: Dirk Nüßler, Fraunhofer FHR

EuMC47-01
Inkjet-Printed, Flexible, High Performance, Carbon Nanotube-Based Sensors for Ammonia and DMPP Gas Detection.
J. G. Hester1, M. M. Tentschert1, Y. Fang1, School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, United States,
1School of Material Sciece, Georgia Institute of Technology, Atlanta, United States

EuMC47-02
Study and Characterization of CNT Inkjet Printed Patterns for Paper-Based RF Components
C. Paragua, K. Friga, S. Bila, D. Baillargeat, XLIM UMR 7252, University of Limoges/ CNRS, Limoges, France

EuMC47-03
Inkjet-Printing of Hybrid Ag/Conductive Polymer Towards Strehachable Microwave Devices
S. Pachuri1, M. Canette1, I. Dick1, G. Doulou1, N. Tsvetanov1, P. Perem1, P. Karg1, P. Coupl1, 1Cirrus CNRS/INSA/THALES UMI 3288, Singapore, Singapore,
2School of Electrical and Electronic Engineering, Singapore University of Technology, Singapore, Singapore, 3Joint International Laboratory, Université de Picardie Jules Verne/INSA/THALES UMI 3288, Villeneuve d’Ascq, France

EuMC47-04
Ultra-Foldable/Stretchable Wideband RF Interconnects Using Laser Ablation of Metal Film on a Flexible Substrate
S. Bouazizi, M. Berthomé, J.-F. Robillard, E. Dubois, Institut d’Electronique, de Microélectronique et de Nanotechnologie, Villeneuve d’Ascq, France

EuMC47-05
Design of Kapton Based Passive Circuits at Microwave Frequencies
Z. Yang1, J. Talvac1, S. Charlot1, D. Dragomirescu1, 1LAAS-CNRS, Toulouse, France, 2Univ de Toulouse, UPS, Toulouse, France, 3Univ de Toulouse, INSA, Toulouse, France

EuMC48-01
A 2.45 GHz, 100 Mbps BPSK-DS/SSS Transmitter for Interference-Robust Wireless Neuropsychiatric Networks
P. Agarwala1, L. Renaud1, J. Baylon1, D. Majumdar2, D. Heo3, C. Schleife4, 1Washington State University, Pullman, United States,
2Dalhousie university, Halifax, Canada, 3Dxaceonics Ultrasound Inc, Halifax, Canada

EuMC48-02
Measurement of Human Exposure to LTE Base Stations - Present Status and Future Challenges
C. Bombelle1, M. A. Hein2, M. Wuschek3, 1Technische Universität Ilmenau, Ilmenau, Germany,
2Technische Hochschule Deggendorf, Deggendorf, Germany

EuMC48-03
Portable 9-4/18.8 GHz harmonic radar system using PRN code principle
M. Hsu1, S. Jan1, T. Tsai1, H. Wang1, F. Chang2, P. Jau2, K. Lin2, 1National Cheng Kung University, Tainan, Taiwan, 2National Taiwan University, Taipei, Taiwan

EuMC48-04
A Wide Dynamic Range Microwave Frequency Discriminator for Cognitive Radio
D. Chatterjee, K. Blau, M. Hein, Technische Universität Ilmenau, Ilmenau, Germany

EuMC48-05
Design of a Differential Diplexer Based on Integrated Active Inductors with 0.25_m SiGeC Process
C. H. Sy1, S. Bosse1, S. Barth1, S. R. Haison1, Observatoire de Paris, Nan, France

EuMC49-01
A Robust Low Phase Noise and Wide Tuning Range Ku-Band Sub- Integer Frequency Synthesizer for E-Band Backhaul Transceivers
R. Levinger, D. Katz, J. Vovnoboy, R. Ben-Yishay, R. Carnon, B. Shienman, N. Mazor, D. Elad, IBM, Haifa, Israel

EuMC49-02
A Ku-Band Series/Short Switching Type S/H IC for Direct RF Under Sampling Reception
T. Koizumi, M. Motosyashi, D. Bandou, O. Wada, S. Kameda, N. Suzuki, T. Takagi, K. Tsubouchi, Tohoku University, Sendai, Japan

EuMC49-03
A 2-30 GHz Ring Mixer with Active Baluns in 0.18-um CMOS Technology for Vital Sign Detection
H. Wang1, J. Cheng1, J. Zhang1, T. Huang1, J. Tsai1, 1Graduate Institute of Communication Engineering, National Taiwan University, Taipei, Taiwan,
2Dept of Electrical Engineering, National Taiwan Normal University, Taipei, Taiwan

EuMC49-04
A Low-Power and Low-Noise X-Band Receiver MMIC in 90nm CMOS
P. Wang1, Y. Shen1, T. Wu1, M. Chen1, Y. Chang2, D. Chang1, S. S. Hue1, 1National Tsing Hua University, Hsinchu, Taiwan,
2National Chip Implementation Center, Hsinchu, Taiwan

EuMC49-05
A Novel Wide-Band Finger-Shaped Phase Shifter Based on Silicon-On-Glass (SOG) Technology for Sub-Millimeter Wave and THz Power Generation
A. Taeb1, S. Gigoyan1, S. Safavi-Naeini1, 1Technische Universität Ilmenau, Ilmenau, Germany,
2Dalhousie University, Halifax, Canada, 3Daxsonics Ultrasound Inc, Halifax, Canada, 4University of Technology, Eindhoven, Netherlands,
5Eindhoven University of Technology, Eindhoven, Netherlands, 6Eindhoven University of Technology, Eindhoven, Netherlands

EuMC50-01
Performance Enhancement of 300 GHz on-Chip Dielectric Slot Antenna by Means of Artificial Dielectrics
W. H. Syed1, G. Fontelet1, D. Cavallin2, P. M. Sarro1, N. Eto1, L. E. Lager2, Delft University of Technology, Delft, Netherlands

EuMC50-02
Array of Dielectric Rod Waveguide Antennas for Millimeter-Wave and THz Power Generation
A. Pharo-Lavoie1, S. Phiri1, E. Garcia2, J. Montoro3, G. Dolber4, D. Laidler5, M. Miranda6, M. Maloisel1, S. Lefort-Romailler1, A. Garcia-Lamperez1, M. Salazar-Palma1, D. Segovia1, A. Rajan1, 1Unversidad Carlos III de Madrid, Leganes, Spain, 2Friedrich-Alexander Universität Erlangen-Nurnberg, Erlangen, Germany, 3Aalto University, Espoo, Finland

EuMC50-03
Detection of DNA by Graphene-on-Silicon FET Structures Simultaneously at DC and 101 GHz
E. R. Brown1, W. Zhang1, L. Viveros1, D. Neff2, N. Green1, M. L. Norton2, P. H. Pham3, P. J. Burke1, 1Wright State University, Dayton, United States,
2Marshall University, Huntington, United States, 3University of California, Irvine, United States

EuMC50-04
Detection by DNA of graphene-on-silicon FET Structures Simultaneously at DC and 101 GHz
E. R. Brown1, W. Zhang1, L. Viveros1, D. Neff2, N. Green1, M. L. Norton2, P. H. Pham3, P. J. Burke1, 1Wright State University, Dayton, United States,
2Marshall University, Huntington, United States, 3University of California, Irvine, United States

EuMC50-05
Detection by DNA of graphene-on-silicon FET Structures Simultaneously at DC and 101 GHz
E. R. Brown1, W. Zhang1, L. Viveros1, D. Neff2, N. Green1, M. L. Norton2, P. H. Pham3, P. J. Burke1, 1Wright State University, Dayton, United States,
2Marshall University, Huntington, United States, 3University of California, Irvine, United States

EuMC51-01
Cognitive Radio Deep Subwavelength Layer Detection
A. Bagger1, L. Tapio2, P. Schille-Benneke1, M. C. Schubert1, M.K. Mathis-Kummer1, P. Haring-Bolívar3, J. Gómez-Veldhoven1, 1University of Cantabria III de Madrid, Leganes, Spain, 2Universität Siegen, Siegen, Germany, 3Universidad Carlos III de Madrid, Leganes, Spain, 4AMOLF, Eindhoven, Netherlands, 5Eindhoven University of Technology, Eindhoven, Netherlands, 6Eindhoven University of Technology, Eindhoven, Netherlands
EuRAD/EuMC Poster01 Session
Chair: Michèle Lalande, University of Limoges
Co-Chair: Laurent Ferro-Famil, University of Rennes 1
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The posters are on display from 12:30h - 14:10h
The authors are present for discussion from 12:30h - 14:10h

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EuRAD/EuMC Poster01-01
RotoSAR: a New Concept of Ground-Based SAR
M. Pieraccini, A. Nicola, P. Federico, R. Silvestro, University of Florence, Firenze, Italy

EuRAD/EuMC Poster01-02
A Real-Time Multiple Target Detecting Scheme based on Microwave Metamaterials
C. M. Wu, Wayne State University, Detroit, United States

EuRAD/EuMC Poster01-03
Phase Noise Analysis in FMCW Radar Systems
K. Siddiq1, R. J. Watson1, S. R. Pochon2, P. Avery2, R. Poulton2, B. D. Norris3, "University of Bath, Bath, United Kingdom, "yNavtech Radar Ltd., Ardington, Wantage, United Kingdom

EuRAD/EuMC Poster01-04
T. Otsuyama1, J. Honda1, K. Shimoi1, G. Minokawa1, Y. Hamanaka1, "Electronic Navigation Research Institute, Chofu, Japan, "Hosei University, Tokyo, Japan

EuRAD/EuMC Poster01-05
FMCM Ramp Non-Linearity Modeling and Measurement Technique for Cooperative Radar
A. Frischen1, J. Hursch1, C. Waldschmidt1, 1Robert Bosch GmbH, Stuttgart, Germany, 1Ulm University, Ulm, Germany

EuRAD/EuMC Poster01-06
Zero-IF Radar Signal Processing
S. Turko, T. Butzuch, Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, Wachtberg, Germany

EuRAD/EuMC Poster01-07
cuDeformer - Software for Reversing Radar Signal Processing, Based on CUDA Technology
J. M. Gambrych1, Warsaw University of Technology, Warsaw, Poland

EuRAD/EuMC Poster01-08
Analysis of Circular Polarization of the Quadrifilar Helix Antenna in the Presence of Ground Plane for LEO Satellites
M. Ahmad1, M. Azrin1, A. A. Khan1, M. T. Azim1, "COMSATS Institute of Information Technology, Lahore, Pakistan, 1Institute of Space Technology, Islamabad, Pakistan, 1Satellite Research and Development Center, Lahore, Pakistan

EuRAD/EuMC Poster01-09
Comparison Study of Scalar and Vector Calibrations for Wideband Modulation Signals
S. Lin1, D. Chang1, Y. Juang1, H. Chiou2, "National Chip Implementation Center/NARI, Hsinchu, Taiwan, 1National Central University, Jhongli, Taiwan

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EuRAD/EuMC Poster01-10
A Low-Cost IEEE802.11ad Wireless Network Appliance Test System with Mixed Domain Oscilloscope and Down Converter
K. Fujiiwara1, T. Kobyashi1, J. Uikita1, Y. Honjo1, "Tokyo Metropolitan Industrial Technology Research Institute, Koto-ku, Japan, "CANDOK Systems Inc., Gyo-da-city, Japan

EuRAD/EuMC Poster01-11
Method of Multi-Channel Calibration for Digital Array Radar
W. Li1, L. Lin, Y. Zhang, J. Yang, Z. Chen, National University of Defense Technology, Changsha, China

EuRAD/EuMC Poster01-12
Wideband Vivaldi Antennas Array with Mechanical Support and Protection Radome for Land-Mine Detection Radar
T. N. Nguyen1, C. Clementi1, C. Migliaccio1, N. Fortino2, J. Daugnac2, J. Willebois2, C. Chekroun3, "LEAT - CNRS - University Nice Sophia Antipolis, Sophia Antipolis, France, 1BOWEN, Saclay, France
EuRAD/EuMC Poster02 Session
Chair: Laurent Ferro-Famil, University of Rennes 1
Co-Chair: Michèle Lalande, University of Limoges

12:30h - 14:10h
The posters are on display from 12:30h - 14:10h
The authors are present for discussion from 12:30h - 14:10h

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EuRAD/EuMC Poster02-01:
Statistical Properties of the Polarization Ratio for Radar Returns with Deterministic Polarized Targets in Clutter
B. Ren1, L. Shi, Y. Chang, S. Xiao, G. Wang1, 1National University of Defense Technology, Changsha, China, 2National University of Defense Technology, Changsha, China

EuRAD/EuMC Poster02-02:
The Study of Microwave Scattering of Anisotropic Sea Surface with the Corrected Two-Scale Model
D. Song, S. Shang, K. Luo, National Key Laboratory of Science and Technology on space Microwave, Xi’an, China

EuRAD/EuMC Poster02-03:
An Analytical Method to Compute Track Continuity Performance Measures
J. S. Wijnhout, Thales Nederland, Hengelo, Netherlands

EuRAD/EuMC Poster02-04:
Target Detection using Space-Time Adaptive Processing (STAP) and a Multi-Band, Multi-Channel Software Defined Passive Radar
M. Alam1, K. Jami1, S. M. Alhumaidi1, 1King Saud University, Riyadh, Saudi Arabia, 2King Saud University, Riyadh, Saudi Arabia

EuRAD/EuMC Poster02-05:
High-Performance Autofocusing for Light-Weight SAR Platforms
I. M. Gorovyi, O. O. Bezvesilnyi, D. M. Vavriv, Institute of Radio Astronomy, Kharkiv, Ukraine

EuRAD/EuMC Poster02-06:
Real Time Classification of Targets Using Waveforms in Resonance Scattering Region
A. Selver1, M. Sermer1, Y. Zoral1, 1Dokuz Eylul University, Izmir, Turkey, 2Yasar University, Izmir, Turkey

EuRAD/EuMC Poster02-07:
Integrated FFT Accelerator and Inline Bin-Rejection for Automotive FMCW Radar Signal Processing
D. T. Nugraha, A. Roger, R. Vignac, Infineon Technologies AG, Neubiberg, Germany

EuRAD/EuMC Poster02-08:
Fast Analysis of Luneburg Lens Radiation by Green’s Function Method
B. Panchenko1, S. Shabunin1, D. Denisov2, 1Ural Federal University Ekatereburg, Russian Federation, 2Ural Technical Institute of Communications and Computer Sciences, Ekatereburg, Russian Federation

EuRAD/EuMC Poster02-09:
SNR in Active Receiving Antenna Used as an Element of Phased Antenna Array for the GURT Radio Telescope
P. L. Tokarsky, A. A. Konovalenko, L. S. Filiukovich, S. N. Yerin, Institute of Radio Astronomy, National Academy of Sciences of Ukraine, Kharkiv, Ukraine

EuRAD/EuMC Poster02-10:
Omnidirectional Cylindrical Microstrip Antennas with Horizontally-Polarized Radiation
A. Y. Svezhentsev1, S. Yar1, V. Volski1, G. A. Vandenbosch2, 1IRE of NASU, Kharkiv, Ukraine, 2Katholieke Universiteit Leuven, Leuven, Belgium

EuRAD/EuMC Poster02-11:
Uniplanar Log-Periodic Antenna with a Perpendicular Plane Reflector Dedicated to a Radio Wave Camera System
F. Ouassli, J. Coupez, P. Pajusco, C. Penson, Télécom Bretagne, Brest, France

EuRAD/EuMC Poster02-12:
Measurement of Point-of-Impact Based on Microwave DMCW Radar and Kalman Filtration
P. Hudec1, P. Pánek1, F. Kozák1, 1Czech Technical University in Prague, Prague, Czech Republic, 2Academy of Sciences of the Czech Republic, Prague, Czech Republic

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EuMC51
Tunable Components for Signal Processing and Detection
Chair: Pierre Blondy, University of Limoges
Co-Chair: Fabio Cocetti, CNRS-LAAS

EuMC52
Special Session on Autonomous Driving in a Worldwide Changing Society – Between Silver Agers and Y-Generation
Chair: Holger H. Meinel,
Co-Chair: Bela Peterson, Consulting4drive

EuMC51-01
Modeling Antennas Printed on Magnetized Substrate: Application to the Design of a Tunable PIFA Antenna
J. Cortes1,2, P. Quéffelec1, A. Chevalier1, G. Verspieren1, J. Matthe1,2, Université de Bretagne Occidentale, Brest, France,
1Université Européenne de Bretagne, Brest, France

EuMC52-01
Market growth potential for Autonomous Driving, differentiated by the analysis of silver agers vs. Y-Generation
Dominique Bonte, ABI Research, Brussels, Belgium

EuMC51-02
Double-Actuation Extended Tuning Range RF MEMS Varactor
A. Cazzorla1,2, R. Sorrentino1, P. Farinelli2, 1University of Perugia, Perugia, Italy, 2R.F. Microtech, Perugia, Italy

EuMC52-02
Is the Y-Generation phenomenon typical for western societies? A view from India
Roland Haas, QSO Technologies India Pvt. Ltd., Bangalore, India

EuMC51-03
Discrete RF-Power MIM BST Thick-Film Varactors
S. Preis1, A. Wiens2, D. Kienemund, D. Kendig1, H. Maune1, R. Jakoby1, W. Heinrich1, O. Bengtsson1, Ferdinand-Braun-Institut Leibniz-Institut fuer Hochfrequenztechnik, Berlin, Germany,
1Technische Universität Darmstadt, Darmstadt, Germany, 2Microsan LLC, Santa Clara, United States

EuMC52-03
Are cars and high tech features like Autonomous Driving important to the Y-Generation?
Katharina Kilian-Yasin, University of Pforzheim, Germany

EuMC51-04
Bistable RF Switches Using Ge2Sb2Te5 Phase Change Material
A. Mentai, A. Bessaoudou, F. Cosset, C. Guines, P. Blondy, A. Crunteanu, XLIM UMR 7252 CNRS/Université de Limoges, 123 Av. Albert Thomas, France

EuMC52-04
Use and benefit of Multi-Purpose Maps. Qui bono?
Heiko Seif, Munich Business School, München, Germany

EuMC51-05
Un-cooled Resonant IR Detectors Based on Barium Strontium Titanate Switchable FBARs
M. Zolfaghari Koohi, S. Lee, V. Lee, S. A. Sis, A. Mortazawi, The University of Michigan, Ann Arbor, United States

EuMC52-05
One world – one innovation? How much customizing for HMI-applications is neccessary?
Bela Peterson, consulting4drive, Berlin, Germany
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| **MIMO Radars**<br>Chair: Krzysztof Kula, Warsaw University of Technology<br>Co-Chair: Gaspare Galati, Tor Vergata University<br>**Radar Systems and MIMO Cancellation in Multisite Mainlobe Interference On Signal Detection With EuRAD08-05**<br>V. Chernyak<sup>1</sup>, Moscow State Aviation Institute, Moscow, Russia<br>M. Krivosheev<sup>2</sup>, A. G. Yarovoy<sup>2</sup>, Delft University of Technology<br>**Radar for Real-Time Short-Range Area Surveillance**<br>K. A. Lukin, P. L. Vyplavin, V. P. Palamarchuk, Russia<br>**Highly Integrated TR Modules: Components, Packaging & Interconnect for “Tile” Antennas**<br>D. M. Craig, A. M. Kinghorn, A. D. McLachlan, Netherlands<br>**Turbulence Intensity Estimation Using Advanced Radar Methods**<br>F. J. Yanovsky<sup>1</sup>, A. C. Dode Nijhuis<sup>2</sup>, D. A. Krasnov<sup>2</sup>, C. M. Ufn<sup>1</sup>, H. W. Russchenberg<sup>1</sup>, A. G. Yarovoy<sup>2</sup>, National Aviation University of Ukraine, Kiev, Ukraine<br>**A Dual-Frequency and Dual-Polarized Patch Antenna at Ka-Band**<br>B. Rohrdanz, J. Jaschke, F. K. Gellersen, A. F. Jacob, Techn. Univ. Hamburg-Harburg, Hamburg, Germany
| **Simple OFDM-Based MIMO Radar for Signals Time-Division in Receive Channels**<br>K. A. Lukin, P. L. Vyplavin, V. P. Palamarchuk, Russia<br>**Distributing Phased-Array Transmitters**<br>F. E. van Vliet, TNO, Netherlands<br>**Feders**<br>F. E. van Vliet, TNO, Netherlands<br>**Eddy Dissipation Rate (EDR) Retrieval with Ultra-Fast High Range-Resolution X-band Airport Radar**<br>F. Barbaresco<sup>1</sup>, Thales Air Systems, Limours, France
| **Noise Radar with Signals Time-Division in Receive Channels**<br>K. A. Lukin, P. L. Vyplavin, V. P. Palamarchuk, Russia<br>**Evolutions of T/R Modules for AESA Applications**<br>P. Eudeline, Thales Air Systems, France
| **On Signal Detection With Mainlobe Interference Cancellation in Multisite Radar Systems and MIMO Radars**<br>V. Chernyak<sup>1</sup>, Moscow State Aviation Institute, Moscow, Russia<br>M. Krivosheev<sup>2</sup>, A. G. Yarovoy<sup>2</sup>, Delft University of Technology<br>**Processing Chain of a Radar Network for Safety Improvement in the Usage of Heavy Machinery**<br>F. Léon-Infiante, J. González-Portúa, R. Blázquez-García, M. Burgos-García, Universidad Politécnica de Madrid, Madrid, Spain<br>**Conformal K Band Array Performance Prediction Based on Improved Element Modeling**<br>G. Nelson<sup>1</sup>, P. Kumar<sup>1</sup>, G. R. Branner<sup>1</sup>, University of California, Davis, United States, Sacramento State University, Sacramento, United States

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**Wednesday, May 13th / Thursday, May 14th**

**THURSDAY**

**EuRAD08**

**EuRAD09**

**EuRAD10**

**EuMC/EuRAD10**

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**Wednesday, May 13th / Thursday, May 14th**

**THURSDAY**

**EuRAD08**

**EuRAD09**

**EuRAD10**

**EuMC/EuRAD10**
After 10 years of cruise, the ESA/CNES/DLR Rosetta mission reached successfully the 67P Churyumov-Gerasimenko comet. One of its main assignments was to carry out in-situ analysis using Philae, a small lander of about 100 kg equipped with scientific instruments. To communicate, Philae uses a radiofrequency relay link with Rosetta in S-band transmitted through small patch antennas. After separation, it was the only means of communication providing valuable information on the lander behavior especially relevant during the rebound landing. After 3 days of successful on-comet scientific activities, Philae had to turn off because of energy shortage. After a broad presentation of the mission, this presentation will focus on the RF subsystem and the role it played in the success of the mission.
EuRAD11
High Resolution and Compressive Sensing Radar Techniques
Chair: Pierfrancesco Lombardo, University of Rome La Sapienza
Co-Chair: Le Chevalier Francois, Delft University of Technology

EuRAD11-01
Unification of Compressed Imaging Techniques in the Microwave Range and Deconvolution Strategy
T. Fromenteze, E. L. Kpé, C. Decroze, D. Carsenat, Xlim research institute - University of Limoges, Limoges, France
16:10h - 16:30h

EuRAD11-02
Fast Implementation of Sparse Reconstruction for CS-based DoA Estimation
M. Gocho, Y. Takahashi, A. Ozaki, Mitsubishi Electric Corporation, Kamakura, Japan
16:30h - 16:50h

EuRAD11-03
Passive UWB Beamforming: a N to M Compression Study
T. Fromenteze, E. Kpré, C. Decroze, D. Carsenat, Xlim research institute - University of Limoges, Limoges, France
16:50h - 17:10h

EuRAD11-04
A Real-Time Unfocused SAR Processor Based on a Portable CUDA GPU
K. Radecki, P. Samczynski, K. Kulpa, J. Drozdowicz, Warsaw University of Technology, Warsaw, Poland
17:10h - 17:30h

EuRAD11-05
New Pre-Estimation Algorithm for FMCW Radar Systems using the Matrix Pencil Method
S. Olbrich, C. Waldschmidt, ‘Robert Bosch GmbH, Leonberg, Germany, ’University of Ulm, Ulm, Germany
17:30h - 17:50h
FRIDAY

EuRAD12
Innovative Radar Architectures and Technologies
Chair: Willem A. Hol, Thales Nederland B.V.
Co-Chair: Philippe Eudeline, Thales Air Systems

EuRAD13
Advanced Radar Processing Techniques
Chair: Mateo Burgos García, Universidad Politecnica Madrid
Co-Chair: María-Pilar Janaro Amores, Universidad de Alcalá de Henares

EuRAD14
Focus Session on Advanced Modelling, Processing and Inversion Applied To Ground Penetrating Radar
Chair: Clément Le Bastard, Cerema-IETR, Université de Nantes
Co-Chair: Lara Pajevski, University of Roma 3

EuRAD12-01
Method to Embed a Data-Link on FMCW Chirps for Communication Between Cooperative 77-GHz Radar Stations
W. Scheiblhofer1, R. Feger1, A. Haderer2, A. Stelzer1, 1Institute for Communications Engineering and RF-Systems, Linz, Austria, 2Inras GmbH, Linz, Austria

EuRAD13-01
Achieving Subclutter Visibility using Estimation of Clutter Intensity and Phase Shift
B. Pikacz, Warsaw University of Technology, Warsaw, Poland

EuRAD14-01
Asymptotic Modelling of Coherent Scattering from Rough Pavements
N. Pinel1, C. Le Bastard1, C. Bourlier3, 1Alyotech, Rennes, France, 2CEREMA, Les Ponts-de-Cé, France, 3IETR, Nantes, France

EuRAD12-02
A Comparison of Staring Radars With Scanning Radars for UAV Detection
S. A. Harman, QinetiQ Ltd, Malvern, United Kingdom

EuRAD13-02
Investigation into Distortion Control in OFDM Radar by Spectral Avoidance
S. R. Pennock, C. H. Jenks, University of Bath, Bath, United Kingdom

EuRAD14-02
A Multifrequency Banach-Space Inversion Method for Ground Penetrating Radar Imaging
A. Fedeli1, M. Pastorino1, A. Randazzo1, C. Estatico1, 1Department of Electrical, Electronic, Telecommunication, University of Genoa, Genoa, Italy, 2Department of Mathematics, University of Genoa, Genova, Italy

EuRAD12-03
Wind Farm Detection using Weather Radar
S. Rzewuski, K. Kulpa, M. K. Baczyk, J. S. Kulpa, A. Gromek, Warsaw University of Technology, Warsaw, Poland

EuRAD13-03
Detection of Micro-motion Targets in Buildings for Through-the-Wall Radar
L. Gou, T. Jin, Z. Zhou, B. Lu, National University of Defense Technology, Changsha, China

EuRAD14-03
Theoretical and Experimental Investigations of a Ground-Based High-Resolution SAR for Buried Object Detection
E. Schreiber, M. Peichl, S. Dill, A. Sagerer, A. Heinzel, F. Bischl, Institut polytechnique de Lyon, France, 2CEREMA, Les Ponts-de-Cé, France

EuRAD12-04
Spectrum Estimation for Cognitive Radar
M. LaManna1, P. Tommasino1, A. Filippetti1, P. Monsurro1, 1Eveellectronics, Rome, Italy, 2Sapienza University of Rome, Rome, Italy

EuRAD13-04
Realtime FPGA-based Processing Unit for a High-Resolution Automotive MIMO Radar Platform
F. Meinl1, E. Schubert1, M. Kunert1, H. Blume1, 1Robert Bosch GmbH, Leonberg, Germany, 2Leibniz University Hannover, Hannover, Germany

EuRAD14-04
Recent Developments of EM Non-Destructive Testing in the Radar Frequency-Band for the Evaluation of Cover Concretes
X. Derober1, G. Villain1, A. Ihamouken1, 1Ifsttar - Centre de Nantes, Bouguenais, France, 2Cerema, Les Ponts-de-Cé, France

EuRAD12-05
An RF Scanning Receiver Based on Photonics for Electronic Warfare Applications
P. Ghelfi1, D. Onori1, F. Laghezza1, F. Scotti1, A. Albertoni2, A. Taluto2, A. Bogoni1, 1CNIT, Pisa, Italy, 2Elettronica SpA, Rome, Italy

EuRAD13-05
Weighted Differenced Phase Short-Time Doppler Estimation and Fixed-Gain Tracking for Industrial Sensor Applications
T. Jänicke1, U. Siart, T. F. Ebner, Technische Universität München, München, Germany

EuRAD14-05
An UWB Through-The-Wall Radar with 3D Imaging, Detection and Tracking Capabilities
P. Millet1, L. Castan1, L. Cadalez2, A. Maurer1, N. Fortino1, J. Daugnac1, G. Clemen1, A. Gaugl1, M. Mirescu1, G. Laped1, J. Rambach1, M. Schlogl1, L. Quelle1, V. Lasser1, 1ONERA, Toulouse, France, 2LIA UNIVERSITY Nice, Valbonne, France, 3University La Rochelle, La Rochelle, France, 4Toniaco, Saint Philibert de Bouaine, France
EuRAD15
New Radar Architecture
and Enabling Technologies
Chair: Andreas Reigber, DLR
Co-Chair: Hermann Rohling, TUH

EuRAD15-01
Coherent Radar/Lidar Integrated Architecture
D. Onori1, F. Laghezza2, F. Scotti2, M. Scaffardi2, A. Bogoni2, 1Scuola Superiore Sant’Anna, Pisa, Italy; 2Inter-university National Consortium for Telecommunications, Pisa, Italy

EuRAD15-02
Data Fusion in a Fully Coherent Photonics-Aided Dual-Band Radar System
F. Scotti1, F. Laghezza1, D. Bogoni1, D. Onori2, 1Inter-university National Consortium for Telecommunications, Pisa, Italy; 2Scuola Superiore Sant’Anna, Pisa, Italy

EuRAD15-03
Emulating Polarimetric Radar Signals from Tornadic Debris Using a Radar-Cross-Section Library
B. Cheong1,2, D. Bodine6, Y. Zhu1,2, C. Fulton1,2, S. Torres1,4,5, T. Maruyama7, R. Palmer1,2, 1Advanced Radar Research Center, University of Oklahoma, Norman, United States; 2School of Electrical and Computer Engineering, University of Oklahoma, Norman, United States; 4Cooperative Institute for Mesoscale Meteorological Studies, University of Oklahoma, Norman, United States; 4National Center for Atmospheric Research, Boulder, United States; 5National Oceanic and Atmospheric Administration, National Severe Storms Laboratory, National Oceanic and Atmospheric Administration, Norman, United States; 7Kyoto University, Kyoto, United States

EuRAD15-04
Statistical Analysis of UHF Bistatic Radar Clutter in Coastal Scenarios
N. del-Rey-Maestre, M. Jarabo-Amores, D. Mata-Moya, P. Gomez-del-Hoyo, J. Bárbara-Humanes, University of Alcalá, Alcalá de Henares, Spain

EuRAD15-05
An Improved Pulse Repetition Frequency Selection Scheme for Synthetic Aperture Radar
B. Pyne1, V. Ravindra1, H. Saito2, 1University of Tokyo, Tokyo, Japan; 2Institute of Space and Astronautical Science (ISAS), Japan Aerospace Exploration Agency (JAXA), Sagamihara, Japan
FRIDAY

**EuRAD16**
Automotive and millimetre-wave radar
Chair: Mateo Burgos Garcia, Universidad Politecnica de Madrid
Co-Chair: Wolfgang Menzel, University of Ulm

**EuRAD17**
Focus Session on Measurement and Processing Techniques for System Diagnostic and Calibration
Chair: Laurent Le Coq, Université de Rennes
Co-Chair: Sergey Pivnenko, Technical University of Denmark

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**EuRAD16-01**
Automobile Radar Co-Channel Interference Modeling, Simulation and Outage Analysis
N. D. J. Hettiarachchi1, RMIT University, Melbourne, Australia

**EuRAD17-01**
Combination of Time and Spatial Filtering to Improve Echo Reduction in Antenna Measurements
M. Sierra-Castafier1, J. Garcia-Gasco2, P. González-Blanco1, M. López-Morales1, F. Saccardi1, L. J. Foged2, Universidad Politécnica de Madrid, Madrid, Spain, 2Microwave Vision Italy, Pomezia, Italy

**EuRAD16-02**
Theory and Practice: A Two-Channel Automotive Radar for Three-Dimensional Object Detection
X. Ding1, A. Carhens2, D. Klotzbuecher2, J. Schaefer3, M. Marple4, W. Poiger5, B. Brust1, F. Trumper1, Autoliv Active Safety, Lowell, United States, 4Autoliv, Schweinfurt, Germany

**EuRAD17-02**
Reflection Coefficient Method for Antenna Radiation Pattern Measurements
J. Ala-Laurinaho, Z. Du, V. Semkin, V. Vikari, A. V. Räisänen, Aalto University School of Electrical Engineering, Espoo, Finland

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**EuRAD16-03**
Modification of DBSCAN and Application to Range/Doppler/DoA Measurements for Pedestrian Recognition with an Automotive Radar System
T. Wagner, R. Feger, A. Stelzer, Johannes Kepler University Linz, Linz, Austria

**EuRAD17-03**
Antenna Measurement Applications for Distributable, Probe-like Network Analyzers
T. Dallmann, R. Cornelius, D. Heberling, RWTH Aachen University, Aachen, Germany

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**EuRAD16-04**
Perimeter Surveillance Radar in W-Band based on Vehicle Collision Avoidance Technology
R. Blázquez-García1, P. Almorox-González1, M. Burgos-García1, C. Callejero-Andrés2, I. Pantoja-Dominguez1, J. Gómez-Maqueda1, Universidad Politécnica de Madrid, Madrid, Spain, 2Alfa Imaging, S. A., Alcalá de Henares, Spain, 3Sensowave, Madrid, Spain

**EuRAD17-04**
Compressed Sensing Approach for Reflectarray Diagnostic from Far Field Measurements
M. Migliore1, B. Fuchs1, L. Le Coq1, F. Ferro-Famil2, Universidad di Cassino e del Lazio Meridionale, Cassino, Italy, 2Université de Rennes 1 - IETR, Rennes, France

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**EuRAD16-05**
Miniaturized 122 GHz ISM Band FMCW Radar with Micrometer Accuracy
S. Scher1, B. Goettell2, S. Ayhan3, A. Bhutani1, M. Pauli2, W. Winkler2, J. C. Scheytt3, T. Zwick1, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany, 2Silicon Radar GmbH, Frankfurt (Oder), Germany, 3University of Paderborn, Paderborn, Germany

**EuRAD17-05**
Application Aspects of Advanced Antenna Diagnostics with the 3D Reconstruction Algorithm
C. Cappellin1, S. Pivnenko2, TICRA, Copenhagen, Denmark, 2Technical University of Denmark, Kgs. Lyngby, Denmark
EuRAD18
EuRAD Closing Session
Chair: Laurent Ferro-Famil, EuRAD 2015 Chair
Co-chair: Michèle Lalande, EuRAD 2015 TPC Chair

12:30h - 13:50h
Buffet Lunch
(Location to be announced at the event)

13:50h - 14:30h
Radar Horizon 2030: Challenges and Emerging Technologies
Albert Huizing, TNO, The Hague, The Netherlands

Future challenges for radar include the demand for high performance and flexibility to counter rapidly changing threats and environments. In addition, the deployment of radars on small platforms requires systems with a small size, weight, power consumption and cost (SWaP-C). Emerging radar signal processing techniques that address these challenges include compressive sensing and cognitive methods such as deep learning. Developments in quantum computing have the potential to enable the application of these emerging signal processing techniques in radar systems.

14:30h - 14:50h
EuRAD Awards Ceremony
Chair: Christian Person, EuMW 2015 Awards Chair
EuRAD Best Paper Award
EuRAD Young Engineer Prize

14:50h – 15:00h
Closing of EuRAD 2015
Laurent Ferro-Famil, EuRAD 2015 Chair

Invitation to EuRAD2016
David Daniels, EuRAD2016 Chair
Welcome from the Workshop and Short Courses Chairs

The EuMW 2015 organising committee has provided you with a large and diverse workshops and short courses programme spanning from well-established microwave theory and technologies to emerging materials, technologies and systems that are currently attracting the interest of the community.

Among a very large number of high quality proposals, we were able to select 21 workshops and 8 short courses. The topics covered comprise theoretical and applicative aspects of circuits and systems for RF and microwave applications. Specific themes are really wide: mm-waves and THz (sensors, high-data-rate communications, tunable circuits, automotive, silicon technologies, integration techniques for SoP, 5G), technologies and design techniques for power devices, filters (reconfigurability, synthesis methods, space applications), nanoscale devices characterization, PCB technology, SDR circuits and systems design, far-field wireless power transmission, nonlinear circuits design, advanced circuits design using symmetry-related electromagnetic properties, bio-electromagnetism, PMSE, high RF power critical effects, RADARs (maritime RADARs, MIMO RADARs, RADAR electromagnetic scattering modelling, geometric RADAR processing), and beamforming networks.

Even though workshops and short courses are endorsed in specific conferences, they should be attended by any scientist planning to broaden its perspectives in the RF and microwave field and looking for an interactive discussion with colleagues all over the world. Indeed the programme is able to attract attendees from several technical backgrounds, from the system level down to new materials and components level. It is noteworthy that we could not put together such a broad workshops and short courses programme without the valuable and dedicated efforts of the organisers and of the authors of the presentations. We hope that you will enjoy technical depth and breadth of the programme and that you will be engaged in fruitful discussion, thus taking great advantage from the interactive nature of the workshops and short courses programme in Paris.
WS01
Sensors towards Terahertz: Novel Technologies for potential «THz Killer Applications» in Life Sciences

Organisers:
Andreas Penirschke, Technische Universität Darmstadt, Germany
Sascha Preu, Technische Universität Darmstadt, Germany

Abstract
The vision of this workshop is to present the interdisciplinary research field of Terahertz (THz) sensor system technologies. Offering higher spatial resolution compared to microwaves, transparency of many materials, as well as sharp spectral features of many biologically, medically, and environmentally relevant substances, sensing can be the “killer” application for THz science. High specificity due to narrow spectroscopic “fingerprints”, and harmlessness due to the non-ionizing nature of THz radiation make it particularly interesting for biomedical applications. Still, there are only few commercial, medical or industrial applications where THz radiation is extensively used, for several reasons: first, the language barrier between engineering and medicine or biology; second, the lower system performance as compared to the microwave and visible (power, speed, and dynamic range); and last but not least the price tag of commercial THz systems. The large potential of THz radiation due to the aforementioned properties requires new concepts to overcome current limitations. Latest approaches and realizations of potentially industrially relevant solutions will be presented in this workshop.

The workshop focuses on two scientific objectives:
1) Key technologies for sensor systems will be addressed, targeting affordable, room-temperature operating THz systems with fast data acquisition. This includes latest developments in terms of high power, semiconductor-based Terahertz sources, low noise detectors, and lasers with fast tuning for high speed photomixing systems.
2) High performance THz systems and novel sensor principles for highest sensitivity and specificity will be discussed. The latter includes functional layers based on graphene and carbon nanotubes or resonant enhancement. Systems will be elaborated at various examples of pioneering experiments, like metabolite detection, plant science, tissue investigation and non-destructive testing. Prospects, hurdles, and preliminary results for a Terahertz lab-on-chip are discussed.
The demand for ever higher data rates is driving research for broadband wireless communications to data rates of 100 Gbps and beyond. This workshop presents research work on 100 Gbps wireless communications that uses carrier frequencies beyond 200 GHz with bandwidths of 20 GHz or more and moderate spectral efficiencies. Various wireless system and component design aspects are covered including mm-wave antenna design, MMIC radio design, broadband analog and digital baseband signal processing, as well as high-data rate protocol processing. The speakers are recognized researchers in their fields. All are actively involved in research on 100 Gbps wireless communications and related fields and work together in the Priority Program of the Deutsche Forschungsgemeinschaft (DFG) SPP 165 “Wireless 100 Gbps and Beyond”. Presentations of six speakers will address challenges and solutions for high data rate wireless communication systems from the perspectives of the overall system as well as the system components in the RF, analog and digital domain. The workshop will close with an interactive panel. The participants will have the possibility to submit questions in written form during the workshop which will then be jointly addressed in the interactive panel. Some samples of the research work such as e.g. antennas, MMICs or modules will be shown. The proposed workshop addresses an emerging technology that is of strong interest to the microwave community. It is currently investigated by various research groups around the world and is gaining attention by standardization organizations and industry.

Organisers:
J. Christoph Scheytt, Heinz Nixdorf Institute, University Paderborn, Germany
Rolf Kraemer, IHP GmbH, Frankfurt (Oder), Germany

Abstract
Reconfigurability/tunability has become an essential feature of modern agile RF and future mm-wave apparatuses and systems for wireless communications, sensing and imaging. In the coming decades there will be a paradigm shift towards smart, cognitive and agile wireless sensing (including imaging) and communication systems. The use of mm-wave frequencies will lead to communications systems showing very high data-rate capabilities along with sensing and imaging systems with high spatial resolution. These include frequency-agile/software-defined and cognitive radios to cope with extendable and reconfigurable multi-service/standard and multi-band operation as well as with efficient spectrum and power utilization. These concepts will reduce significantly the number of components, hardware complexity, cost and human radiation exposure compared to today’s radio technology which relies on incompatible communications systems with inflexible hardware. Space-agile antenna configurations for flexible and efficient beam-scanning, beam-focusing, and beam-forming allow for precisely focusing the microwave energy into well-defined areas. This workshop will focus on tunable circuits showing very high data-rate capabilities along with sensing and imaging systems. The use of mm-wave frequencies will lead to communications systems including mm-wave antenna design, MMIC radio design, broadband analog and digital baseband signal processing, as well as high-data rate protocol processing.

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Gustavo Pamplona Rehder, Laboratoty of Microelectronics, University of São Paulo, Brazil
Rolf Jakoby, Technische Universität Darmstadt, Germany

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Organisers:
Kamal K. Samanta, Milmega/AMETEK Ltd., UK
Bumman Kim, Pohang University of Science and Technology (POSTECH), Korea

Abstract
Advanced RF/microwave applications demand power amplifiers with ever greater linear power in conjunction with high efficiency and bandwidth at a low cost. As a result, power amplifiers are considered as the most critical and expensive component in a RF-front module, and the new power systems, like RADARS, transmitters, EMC tester, jammers, etc., require the latest state-of-the-art semiconductor and integration technologies to deliver optimum performance within a compact size and light weight. The attractive material properties of GaN make GaN-HEMT a superior candidate to meet these demanding requirements, and since its introduction GaN PAs have been creating many records. However, their potential still needs to be better understood and utilized. In a GaN transistor, owing to generation of ultra-high heat flux at the micro-scale gate fingers, PAs are thermally limited much below the electrical capability of the devices. As a result, efficient and novel design technique, thermal management, biasing technique, mode/class of operation etc. play very crucial roles towards gratifying the new generation PA requirements. In addition, withstanding high output mismatch and achieving linearization and modulation requirements with an extreme bandwidth (like in EMCEW); meeting the power, bandwidth as well as efficiency in Doherty; and the effect of trapping/memory on a device performance raise several technical challenges to address.

This timely workshop will attribute a wide range of presentations, highlighting the recent important advancements in GaN PA circuits design and linearization to system implementation. Most importantly, the workshop will make participants aware of the critical issues with design hints, technology challenges and the latest state-of-the-art developments in terms of bandwidth, output power, linearity and efficiency, which enabling advanced industrial applications from mono-and multi-band wireless communication to ultra-wideband EMC and RADARs. The speakers are the experts and are the leading contributors in both industrial and academic sectors.

WS05
GaIN Technology for Space Applications

Organisers:
Paolo Colantonio, University of Roma Tor Vergata, Italy
Francisco de Arriba, TTI, Spain

Abstract
With the increased usage of satellite communication systems, high efficiency and high output power amplifiers have also been required for satellite transponders and will be demanded in the future.

In this context, solid-state power amplifier (SSPA) based on GaN technology is considered a promising optimum solution to replace the actual travelling wave tube amplifiers (TWTA) which need extremely high voltage (thousands of volts) and whose reliability is critical due to hot electrons in vacuum tube. Currently, power GaN technology is beginning to be used in the terrestrial commercial application for telecommunications high power and high efficiency technology a key factor for base stations. The advantage of GaN is the wider frequency bandwidth, the better thermal budget (suitable for CW mode application), the integration (compact module for radar) and the higher cut-off frequency. The exploitation of GaN technology for space applications is the basis for addressing the space market and developing future business opportunities. The aim of this workshop is to present significant contributions related to activities and scientific results performed for the space qualification of GaN technologies in Europe.

Programme
Welcome
A 230W complete SSPA for Galileo Satellite System
Exploiting GaN European Technology: the SLOGAN Project
Francisco de Arriba, and Rocco Giofrè, TTI, Spain, and Univ. Roma Tor Vergata, Italy
Towards the realization of a single-chip front-end in GaN technology
Ernesto Limiti, University of Roma Tor Vergata, Italy
GaN-based DC-DC converters in space
Rudiger Quay, Fraunhofer IAF, Freiburg, Germany
Coffee Break
Selex ES GaN Technology for Space Application
Claudio Lanzieri, Selex-ES, Italy
P-band High Power GaN SSPA
Hans Harbers, TNO, Netherlands, Pier Giorgio Arpesi, Selex-ES, Italy
In Orbit Demonstration of European GaN technology - first results and lessons learned
Andrew Barnes, ESA-ESTEC, Netherland
Discussion
WS06
Recent Advances on High Performance Reconfigurable Filters

Organisers:
Paola Farinelli, RF Microtech SRL, Italy
Jorge Daniel Martinez, Technical University of Valencia, Spain

Abstract
This workshop focuses on recent advances and challenges associated to the realization of high performance reconfigurable microwave filters. This is an exciting and very challenging topic that is evolving from basic frequency tuneable structures to highly reconfigurable devices capable of keeping a competitive EM performance compared to their fixed counterparts. The first part of the workshop will focus on lumped-element, planar and substrate-integrated structures targeting moderate-to-high Q-factor in a very compact footprint. The second part will focus on recent realizations of high-Q 3D tuneable filters.

Different tuning technologies will be covered during the workshop: from semiconductors to RF MEMS, liquid crystals or piezo-motors among others. Moreover critical issues like in-band performance degradation, constant absolute bandwidth and type-of response control will be discussed. The workshop is promoted by the EuMA Topical Group on RF MEMS.

Programme
09:00h - 09:10h Welcome
09:10h - 09:55h Micromachined transfer function adaptive filters
Dimitros Perolis, Purdue University, USA
09:55h - 10:40h MEMS, PCM and mechanical tunable filters
Pierre Blondy and Stephane Bila, XLIM CNRS Université de Limoges, France
10:40h - 11:20h Coffee Break
11:20h - 12:05h Compact tunable filters based on substrate integrated coaxial resonators
Stefano Sirci, Technical University of Valencia, Spain
12:05h - 12:50h Electronically tunable filters based on microwave liquid crystal technology
Tobias Franke and Antonio Prasetiadi, Technische Universität Darmstadt, Darmstadt, Germany
13:00h - 14:20h Lunch Break
14:20h - 15:05h Compact tunable filters based on substrate integrated coaxial resonators
Stefano Sirci, Technical University of Valencia, Spain
15:05h - 15:50h Electronically tunable filters based on microwave liquid crystal technology
Tobias Franke and Antonio Prasetiadi, Technische Universität Darmstadt, Darmstadt, Germany
16:00h - 16:30h Coffee Break
16:30h - 17:15h Recent advances on high performance reconfigurable filters
Ming Yu, COMDEV, Canada
17:15h - 18:00h Open discussion and concluding remarks

WS07
RF-Technologies on the Move: The Races of Integrated mm-Wave Automotive Radar and Sensing Technologies

Organisers:
Franz Dielacher, Infineon Technologies, Villach, Austria
Ruediger Quay, Fraunhofer IAF, Freiburg, Germany

Abstract
Safety and mobility are key aspects of societal changes declared by the European Community. Mm-wave IC radar and active sensing technologies have been commercially on the move since the early nineties to provide cost and energy efficient high-performance radars for an increasing number of cars and thus human beings saved from crashes. Ever since specialized GaAs ICs have been declared technologically dead a million times, however, are still being and continue to be deployed for the different systems in greater numbers for some time. Efficient SiGe bipolar technologies are being now available and integrated in this innovative, however, in some ways also conservative market. In addition silicon CMOS in the latest generations is now also discussed to provide advantages based on the reduction in power as radar manufacturers will need more beams with finer resolution which translates into more chip area. Further the co-integration of the digital functions holds great promise for the overall radar functionality on system level. Further III-V devices still hold their beauties for even more advanced systems. The workshop will discuss the actual balance in this race at this point in time. Five speakers, at least one from each part of the community, will provide their visions. A panel organised at the end will discuss issues collected during the talks.

Programme
09:00h - 09:10h Welcome
09:10h - 09:55h Advanced SiGe Circuits for mm-Wave Radar Applications
Nils Pohl, Fraunhofer FHR, Germany
09:55h - 10:40h SiGe BiCMOS Devices for Active Safety Systems
Franz Dielacher, Infineon Technologies, Austria
10:40h - 11:20h Coffee Break
11:20h - 11:50h Millimeter-wave CMOS automotive radar-on-chip: tomorrow or the day after?
Wim van Thillo, IMEC, Belgium
11:50h - 12:20h Trends for modern GaAs integrated car radars
Klaus Beilenhoff, United Monolithic Semiconductors, Germany
12:20h - 12:50h Highly integrated InP DHBT-based receive/transmit MMICs for high data rate wireless communication in the D-band (110-170 GHz)
Herbert Zirath, Chalmers University, Sweden
12:50h - 13:00h Discussion
Abstract

One of most overlooked challenges in metrology is the microwave characterization of nanoscale materials and components. New electrical measurement methodologies and analyses are required to characterize the behavior of these new emerging materials and devices. Indeed, HF Instruments and methodologies are confronted with major limitations in terms of accuracy with respect to nanodevices. The main causes are related to the dimensional and electrical mismatches comparing to the current equipment. The impedances of nanodevices reach several KΩ which is too far, compared to the 50 ohms normalized impedance. Moreover, test structures generate important parasites as compared to the intrinsic values. In this context, the workshop will present different characterization methods with or without contacts developed to characterize the nanodevices. All the brand new techniques for microwave characterization combining GSG micro-probes, non-contact probing, and SMM will be presented.

Programme

14:00h - 14:15h Welcome
14:00h - 14:15h Opening

WS09
Microwave Measurements and Electromagnetic Simulations of Printed Circuit Boards (PCBs) for High Speed Digital and Radio Frequency (RF) Applications

Programme

09:00h - 09:25h A reference printed circuit board (PCB) for validating microwave measurements on PCBs and a differential calibration kit for traceable measurements
Martin Salter1, Nick Ridler1, Djamel Allal2, Francois Ziade2, Martin Hudicka3 and Tomas Pavlicek3, 1NPL, Teddington, UK, 2LNE, Paris, France and 3CMI, Prague, Czech Republic

09:25h - 09:50h An overview of the microwave measurements techniques
Siddharta Sinha1, Franz-Josef Schmueckle1, Ralf Doerner1, and Andrej Rumiantsev2, 1FBH, Berlin, Germany and 2MPI Corporation, Hsin Chu, Taiwan

10:00h - 10:35h De-embedding techniques in measurements of printed circuit board (PCB) backplanes and dense fixture environments
Jon Martens, Anritsu, Morgan Hill, CA, USA

10:40h - 11:05h Coffee Break

11:05h - 11:40h Multiport Vector Network Analyzers: A powerful tool for the verification of high-data-rate digital circuit designs
Mike Reiso, Keysight Technologies, Santa Rosa, CA, USA

11:45h - 12:10h Multipoint Calibration kit for traceable measurements
Paul Carre, Neil Chamberlain, and Martyn Gaudion, Polar Instruments Ltd, Guernsey, UK

12:15h - 12:40h Panel Discussion

12:45h - 13:00h Lunch

13:00h - 13:25h A reference printed circuit board (PCB) for validating microwave measurements on PCBs and a differential calibration kit for traceable measurements
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**WS10**

**Transceiver/IF Structures and Modelling for Wideband and SDR Systems**

**Organisers:**
Nuno Borges Carvalho, Universidade de Aveiro, Portugal
Jon Martens, Anritsu, USA

**Abstract**
This new workshop aims to cover aspects related to transceivers for wide-IF and SDR systems, which is a rapidly growing area of investigation for 5G and other applications. As SDR systems proliferate and wider-IF receivers and transmitters are needed for other reasons (multi-channel, wide modulation bandwidth...), the study of the transceivers themselves is increasingly important. Topics including IF and system model development, receiver front-ends, transceiver metrics (including EVM and separate linearity measures), wide- and multiple-IF system structures, will be covered in this workshop.

**Programme**

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<tr>
<td>14:30h - 15:10h</td>
<td>System Modeling of Wideband Receivers</td>
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<tr>
<td></td>
<td>John Wood, Maxim Integrated</td>
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<td>15:10h - 15:50h</td>
<td>Using behavioural models in the design of nonlinear microwave circuits. Application to microwave power detectors and (free-running/synchronized) oscillator circuit design</td>
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<td>M. F. Bariola, Ana Peláez-Pérez, A. Rodríguez-Testera, S. Woodington and P. J. Tasker, Universidad de Vigo, Spain</td>
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<td>15:50h - 16:20h</td>
<td>Coffee Break</td>
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<td>16:20h - 17:00h</td>
<td>System level modelling of wideband transceiver components using advanced nonlinear measurement techniques</td>
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<td>Christian Fager, Chalmers University, Sweden</td>
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<tr>
<td>17:00h - 17:30h</td>
<td>The use of Mixed-signal Characterization for SDR design</td>
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<td>Nuno Borges Carvalho, Universidade de Aveiro, Portugal</td>
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<tr>
<td>17:30h - 18:00h</td>
<td>Wide-IF receiver linearity and distortion mechanisms</td>
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<td>Jon Martens, Anritsu, USA</td>
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<tr>
<td>18:00h - 18:10h</td>
<td>Discussion</td>
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**WS11**

**Far-field Wireless Power Transmission**

**Organisers:**
Nuno Borges Carvalho, Universidade de Aveiro, Portugal
Apostolos Georgiadis, CTTC, Spain
Alessandra Costanzo, University of Bologna, Italy
Luca Roselli, University of Perugia, Italy

**Abstract**
In this workshop far-field wireless power transmission will be discussed and analysed. The workshop will address WPT applications, theory and techniques in a plenitude of solutions spanning from the Internet of Things, Space applications, 5G approaches with a general concept in mind that is the removal or reduction of battery needs. Confirmed speakers from different continents will give an overview of what is being done in this direction in Europe, Japan and USA. It is expected that some demonstrations will be presented and discussed during the workshop.

**Programme**

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<td>09:00h - 09:10h</td>
<td>Welcome</td>
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<tr>
<td>09:10h - 09:55h</td>
<td>Wireless grid to realize battery-less wireless sensor networks</td>
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<td>Kei Sakaguchi, Osaka University, Japan</td>
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<td>09:55h - 10:40h</td>
<td>Microwave compact rectenna for far-field powering of wireless sensors</td>
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<td>Alexandru Takacs, CNRS, LAAS, Univ de Toulouse, Toulouse, France</td>
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<tr>
<td>10:40h - 11:20h</td>
<td>Coffee Break</td>
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<tr>
<td>11:20h - 12:05h</td>
<td>Non-directive and directive far-field wireless powering system analysis</td>
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<td>Zoya Popovic, University of Colorado, Boulder, USA</td>
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<tr>
<td>12:05h - 12:50h</td>
<td>Far-field wireless power transfer for autonomous sensors</td>
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<td>Hubregt Visse, Holst Centre IMEC and Eindhoven University of Technology, Holland</td>
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<td>13:00h - 14:20h</td>
<td>Lunch Break</td>
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<td>14:20h - 15:05h</td>
<td>Energy Autonomous RF systems for wearable applications</td>
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<td></td>
<td>Alessandra Costanzo, University of Bologna, Italy</td>
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<tr>
<td>15:05h - 16:00h</td>
<td>Circuit challenges and optimization of far-field wireless power transfer systems</td>
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<td>Apostolos Georgiadis and Ana Collado, Centre Tecnologic de Telecomunicaciones de Catalunya, Spain</td>
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<tr>
<td>16:00h - 16:30h</td>
<td>Coffee Break</td>
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<td>16:30h - 17:15h</td>
<td>Energy Shower and Energy Evaporation, two opposite directions to wirelessly power supply daylife electronic equipments</td>
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<td>Luca Roselli, University of Perugia, Italy</td>
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<tr>
<td>17:15h - 18:00h</td>
<td>Multi-band WPT for passive sensor networks</td>
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<td></td>
<td>Nuno Borges Carvalho, Universidade de Aveiro, Portugal</td>
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<tr>
<td>18:00h - 18:10h</td>
<td>Open discussion and concluding remarks</td>
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WS12
SiGe for mm-Wave and THz

Organisers:
Thomas Zimmer, University of Bordeaux, France

Abstract
This workshop will cover SiGe HBT technologies as well as SiGe enabled mm-wave and THz applications. In fact, nowadays SiGe technologies have passed the 600 GHz barrier in terms of maximum oscillation frequency and the 700 GHz barrier is foreseen to fall in 2015. Intrinsic advantages of SiGe HBTs such as co-integration with CMOS permit to design compact, reliable and cost efficient systems for mm-wave applications.

The workshop comprises 4 sessions: In the first session, the world-leading SiGe technologies from Europe will be presented. The second sessions address compact modelling and design challenges for mm-wave and THz devices and circuits. In the third sessions, radar related innovative design concepts will be introduced. In the last session, end users will give insights about application challenges and potential solutions for qualified products.

Programme
09:00h - 09:10h  Welcome
09:10h - 09:40h Advances in SiGe BiCMOS Technology for mm-Wave Applications in the DOTSEVEN Project
Klaus Auinger, Infineon, Germany
09:40h - 10:10h 55nm SiGe BiCMOS for Optical, Wireless and High-Performance Analog Applications
Pascal Chevalier, STMicroelectronics, France
10:10h - 10:40h Optimization of vertical doping profiles for high-speed SiGe HBTs
Holger Rücker, IHP, Germany
10:40h - 11:20h Coffee Break
11:20h - 12:05h Impact of physical effects and compact modeling on mm-wave circuit performance
Andreas Pawlak, Dresden University of Technology, Germany
12:05h - 12:50h Challenges in Modeling, Design, and Characterization of Terahertz Circuits in Silicon
Ullrich Pfeiffer, University of Wuppertal, Germany
13:00h - 14:20h Lunch Break
14:20h - 15:05h From Adaptive Modulation Schemes towards Software Defined Radar (SDR)
Andreas Stelzer, Johannes Kepler University Linz, Austria
15:05h - 16:00h Concepts for Highly Integrated Automotive Radar Circuits
Rainer Stuhlberger, Infineon - DICE GmbH & Co KG, Austria
16:00h - 16:30h Coffee Break
16:30h - 17:15h Beyond 10 Gbit/s mm-wave wireless communication using SiGe BICMOS transceivers
Erik Öjefors, SiversIMA, Sweden
17:15h - 18:00h Application challenges and potential solutions for robust radar sensors
Dirk Steinbuch, Bosch, Germany
18:00h - 18:10h Open discussion and concluding remarks
SCS01
Nonlinear Microwave Circuit Design: The Basics of Computer Aided Nonlinear Microwave Circuit Design

Organisers:
José C. Pedro, Instituto de Telecomunicações – Universidade de Aveiro, Portugal
David E. Root, Keysight Technologies, Inc., USA

Abstract
Because most electrical engineering programs and industrial design procedures are still focused on linear analysis and design tools, the vast majority of microwave designers are not prepared to profit from the technological advancements that have been made on nonlinear microwave simulation, active device modeling and specific laboratory instrumentation for device characterization, model extraction and performance verification. So, they tend to conduct their designs relying on experience, heuristic concepts, and many trial and error iterations in the lab.

The Short Course on The Basics of Computer Aided Nonlinear Microwave Circuit Design was exactly conceived to bridge this gap. It starts by providing a summary of the properties of nonlinear systems to then evolve to review the various CAD tools – nonlinear device models and circuit simulators – available to assist the microwave circuit designer. Then, to facilitate the comprehension of these concepts, the course presents a practical perspective of the application of these tools presenting and discussing with the attendees all the steps comprising the design of a power amplifier from the active device model extraction, to the selection of bias and terminations, up to the performance verification.

Therefore, the learning objectives and outcomes of this short course are to provide the attendees with the basics of nonlinear microwave circuit design, usually lacking in their college (and even some times graduate school) education, which will enable them to profit from the recent developments we have seen in nonlinear circuit simulation algorithms, active device model formulation and dedicated laboratory instrumentation for nonlinear model extraction and design verification.

SCS02
Fundamentals of Microwave Power Amplifier Designs

Organisers:
Ali Rezazadeh, University of Manchester, UK
Franco Giannini, Universita’ di Roma ‘Tor Vergata’, Italy

Abstract
Semiconductor power amplifiers are a key component of the circuitry that drives RF and microwave transmission and have received a great deal of attention and development effort over the last decade. This short course aims to provide a comprehensive overview of all aspects of fundamental semiconductor microwave power amplifiers designs. The course is an introductory module aimed at graduate engineers who have moved into the field of RF design. The speakers are experts in these areas from well-known recognized organizations.
SCS03
Design by Mathematics of Full Software Radio Circuits and Systems: Methodology and Application to 5G Standard

Organisers:
François Rivet, University of Bordeaux, France

Abstract
The goal of this tutorial is to present our original methodology of Full Software Radio system design. The diversity of communication standards implies the use of multi-band and multi-mode radios. That is why Full Software Radio proposes to challenge a new way of integrating RF circuits and systems by tackling the main issue: transceiving concurrently any RF signal within a very wide band of interest for telecommunication industry, from DC to 5 GHz for instance. The focus of this tutorial will concern the design by mathematics of such RF transceiver, exploring novel approaches along with a thorough discussion of advanced techniques for these receivers and transmitters towards a revolution in RF integrated circuits and systems using 28 nm FDSOI STMicroelectronics technology.

Programme
14:20h - 14:30h Welcome
14:30h - 16:00h Sampled Analog Signal Processor (SASP)
François Rivet, University of Bordeaux, France
16:00h - 16:30h Coffee Break
16:30h - 17:15h Walsh transmitter
Yann Deval, University of Bordeaux, France
17:15h - 18:00h The Riemann Pump
Yoan Veyrac, University of Bordeaux, France
18:00h - 18:10h Discussion
WM01
Fundamentals and Engineering Considerations of Terahertz Technologies: from Devices to Applications

Organisers:
Dimitris Pavlidis, Boston University & National Science Foundation, USA
Imran Mehdi, Jet Propulsion Laboratory (JPL), USA
Javier Mateos, University of Salamanca, Spain

Abstract
THz technology development is a vibrant scientific field with new discoveries and techniques being utilized to advance the State-of-the-Art. While novel material systems such as graphene have shown promise in the THz range, fully functional systems in the THz range are also becoming more common. This 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 and Graphene, 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. Devices such as Quantum Cascade Lasers and Self-switching Diodes will also be addressed. The Workshop is intended primarily for young scientists and engineers who are interested in learning about this emerging field, but is also useful for individuals with a more advanced understanding of related concepts. The topics addressed include fundamental and engineering considerations. The latest results in Terahertz technologies will also be presented.

Programme
08:30h - 08:40h Welcome
08:40h - 09:10h Terahertz Applications and Upcoming Space Missions
Imran Mehdi, Jet Propulsion Laboratory, Pasadena, CA, USA
09:10h - 09:40h Fundamentals and Latest Results on Nitride-based Two- and Three-Terminal Devices for frequencies extending to Terahertz
Dimitris Pavlidis, Boston University, USA
09:40h - 10:10h Planar nanodiodes for THz detection and mixing
Javier Mateos, University of Salamanca, Spain
10:10h - 10:50h Coffee Break
10:50h - 11:20h Frequency increase and high functionality of room-temperature terahertz oscillators using resonant tunneling diodes
Masahiro Asada and Safumi Suzuki, Tokyo Institute of Technology, Japan
11:20h - 12:00h THz Optoelectronic devices
Yanko Todorov, Stefano Barbieri, Djamal Gacemi, Maria Amanti, Angela Vasanelli and Carlo Sirtori, Université Paris-Diderot, France
12:00h - 13:50h Lunch Break
13:50h - 14:20h Physical Limits and Latest Developments of Terahertz Plasma Field Effect Transistor Detectors
W. Knap, D. But, A. El Fatimy, P. Buzatu, O. Klimenko, N. Diakonova, L2C & TERALAB Montpellier University &CNRS, Montpellier, France
14:20h - 15:00h Graphene-based terahertz optoelectronic devices
Berardi Sensale-Rodriguez, University of Utah, USA
15:00h - 15:30h High performance terahertz radiation sources based on plasmonic photoconductors
Mona Jarrahi, University of California in Los Angeles (UCLA), USA
15:30h - 16:10h Coffee Break
16:10h - 16:40h GaAs-Based Extrinsic-Photoconductive THz Sources Driven at 1550 nm
E.R. Brown, J.R. Middendorf, and J.S. Cetnar, Wright State University, USA
16:40h - 17:10h Photomixing mW THz sources
G. Ducournau, P. Latzel, F. Pavanello, E. Peytavit, M. Zaknounne, J.-F. Lampin, IEMN, Villeneuve d’Ascq, France
17:10h - 17:50h Open discussion and concluding remarks

Organisers:
Ferran Martin, Universitat Autònoma de Barcelona (UAB), Spain
Francisco Medina, Universidad de Sevilla, Spain

Abstract
The workshop is focused on design techniques for different types of microwave components that are based on symmetry-related electromagnetic properties or principles. These techniques, mainly based on concepts such as the electric/magnetic wall and/or the selective mode excitation/suppression of reactive (resonant) elements, will be analyzed in detail and will be applied to the design of diverse microwave components, such as common-mode suppressed balanced lines and circuits (mainly, although not exclusively, filters and dividers/combiners), half-mode substrate integrated waveguide (SIW) based circuits, and microwave sensors, among others.

Advantages and limitations of such techniques, to the light of the specific considered components, will be pointed out. Although symmetry properties have been used for the analysis of symmetric microwave circuits for years, the application of concepts such as symmetry disruption or symmetry-based selective mode excitation/suppression (among other symmetry-related concepts) to achieve device functionalities is an active research area today. These concepts/principles will be presented in a coherent manner in the workshop, and will be illustrated with multiple examples of applications.

Programme
08:30h - 08:40h Welcome
08:40h - 09:10h Use of Symmetry and Asymmetry in Planar Passive Structures
Tatsuo Itoh, University of California Los Angeles (UCLA), USA
09:10h - 09:40h Symmetric artificial transmission lines for common-mode bandstop and differential-mode bandpass filtering
Francisco Medina1 and Jia-Sheng Hong2, 1Universidad de Sevilla, Spain and 2Heriot-Watt University, Edinburgh, Scotland, UK
09:40h - 10:10h Differential-mode metamaterial transmission lines and applications
Paris Vélez, Jordi Bonache and Ferran Martín, Universitat Autònoma de Barcelona (UAB), Spain
10:10h - 10:50h Coffee Break
10:50h - 11:20h Wideband Balanced Filters With High-Selectivity and Common-Mode Suppression
Qing-Xin Chu, Xiao-Hu Wu, and Lei-Lei Qiu, South China University of Technology, Guangzhou, Guangdong, China
11:20h - 11:50h Collaborative Design of Balanced-to-Balanced Power Divider/Combiner
Lin-Sheng Wu and Junfa Mao, Shanghai Jiao Tong University, Shanghai, China
11:50h - 12:20h Microwave sensors based on symmetry properties of resonator-loaded lines
Jordi Naqui1, Ali Karami-Horestani2, Christophe Fumeaux2 and Ferran Martín1,
1Universitat Autònoma de Barcelona (UAB), Spain, and 2University of Adelaide, Australia
12:20h - 12:30h Discussion
Bio-ElectroMagnetism for Biological and Medical Applications: Latest Developments on Implantable Micro-Devices, Sensing Concept and Modelling Approaches

Organisers:
Dubuc David, LAAS-CNRS, France
Grenier Katia, LAAS-CNRS, France

Abstract
Electromagnetic fields from low frequency to millimeter wave are presenting lots of interests for biomedical applications. Among them is emerging the possibility to non-invasively investigate the living at various levels from tissue/organ to cellular, with the objective to early diagnose diseases and improve the efficiency of prognostic and therapies. This workshop will consequently address the latest advances on the biomedical use of electromagnetic waves and covers:

1. bio-sensor/stimulator concept for biological cells, blood, tissue and organs analysis;
2. microelectronics for bio-signals sensing and readout processing;
3. body-centric wireless communication and wireless power transfer for medical devices;
4. dosimetry issue related to electromagnetic fields.

The first presentation focuses on the development of implantable wireless micro devices for clinical applications (US). The second talk will highlight recent advances in the design of tissue-equivalent phantoms for body-centric communication studies at millimeter-waves and their applications to antennas & propagation studies in V band (FR). The third presentation deals with the design of a wearable neuromodulator using computational models (UK). The fourth presentations are dedicated to the dosimetry of electromagnetic fields in bio-matter (IT). The fifth talk deals with the biological cells analysis in a lab-on-chip (FR) and the last presentation will address the use of a microwave waveguide-based dielectrometry for the discrimination of healthy and diseased human erythrocytes (Ukraine).

The workshop provides a large overview of actual “hot topics” in bio-electromagnetism. Worldwide and outstanding researchers will share their expertise and latest results in the field.

Programme

13:50h - 14:00h Implantable Wireless Medical Devices
J.-C. Chiao, University of Texas at Arlington, USA

14:00h - 14:30h Body-Centric Wireless Communications at Millimeter Waves: from Experimental Modeling of the Human Body to Antenna & Propagation Studies
Maxim Zhadobov1, Nacer Chahat2, Anda Guraliu2, Carole Leduc1, and Ronan Sauleau1. 1IETR, Rennes, France and 2JPL/ NASA, Pasadena, USA

15:00h - 15:30h Using Computational Models to Optimise a Neuromodulator
Arsam Shiraz and Andreas Demosthenous, University College London, UK

16:10h - 16:40h Microdosimetry point of view in biomedical and biotechnological framework
Caterina Merla, Francesca Appollonio, and Micaela Liberti, ENEA, Sapienza University of Rome, Italy

16:40h - 17:10h Microwave Dielectric Spectroscopy for Cellular Analysis
Katia Grenier and David Dubuc, LAAS-CNRS, Toulouse, France

17:10h - 17:40h Microwave Waveguide Dielectrometry of Human Erythrocytes as a Tool for Discrimination of Health Status
Kateryna Arkhypova, Institute for Radiophysics and Electronics of National Academy of Science of Ukraine, Ukraine

17:40h - 17:50h Discussion
**WM04**

**Millimeter-wave Multilayer MCM/SoP and Heterogeneous Integration Techniques**

**Organisers:**
Kamal K. Samanta, Milmega/AMETEK Ltd., UK
Ali A Rezazadeh, School of Elect and Electronic Eng., University of Manchester, UK

**Abstract**
Owing to several advantages, mm-wave has found an ever-increasing interest for commercial as well as military applications, covering the areas from high speed wireless communication and space science to defense and security. In an mm-wave system, because of interconnecting parasitic, the assembling techniques are more complex and costlier than MMIC/RFICs. The multilayer/3D Multi-Chip-Module (MCM/SoP), with heterogeneous integration, is widely regarded as an excellent solution for realizing compact mm-wave components economically and with ever-greater functionality and reliability. In the past decade, there is enormous advancement in this field, leading to novel component and circuit/system architectures with exceptional miniaturization, performance and reliability, and hence making the challenging applications feasible and cost-effective. This very timely workshop will feature a range of presentations and will provide a comprehensive overview and understanding on recent important progresses in multilayer MCM/SoP technologies: in dielectric substrate, like LTCC, LCP photoimageable thick-film, and IPD/BCB, for embedding high quality passives (up to 100 GHz and beyond); metallization processes, such as Inkjet-printing, Photoimageable and Aerosol-jet printing, for fine and well-defined metal-track geometry; and multilayer substrate and heterogeneous and M3 integration and packaging techniques. Furthermore, will cover the very recent advancement in smart RFICs, 3D/2.5D MMICs, like Si/glass interposer based ICs, and in mixed-technologies (such as ferrites in LTCC), realizing novel components for emerging microwave and mm-wave applications.

**Programme**

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**WM05**

**Millimeter-Wave Technologies for 5G Mobile Networks**

Organisers:
Laurent Dussopt, CEA-LETI, France  
Frédéric Gianesello, STMicroelectronics, France

**Abstract**

Millimeter-waves (mm-wave) are seen as key technology enablers for future 5G wireless mobile networks in order to take advantage of the wide spectrum bands available from 18 GHz up to 95 GHz and even beyond to provide multi-Gbps broadband access to mobile users and high-capacity wireless backhaul links between access points/base-stations. This application field is very active throughout the world for a couple of years with first demonstrations coming up and standardization activities expected to start as soon as 2015 in 3GPP and other standardization bodies; first regulations are expected around 2018 by the ITU-R.

The workshop will include several talks by high-level experts from industry and academia who will present their vision of 5G, the role of mm-wave communications and the main needs/requirement in this domain. The current state of the art and their most recent achievements in such essential fields as RFIC technology and architectures, integration technologies (e.g. system-in-package technologies such as multi-layer organic, ceramic, wafer-level packaging, silicon 3D packaging), integrated and reconfigurable antennas (SiP antennas, beam-steering/beam-switching phased-arrays, lenses) will be presented.

Mobile communications, as a mass market, may be the main driver of mm-wave technology research for the coming years and they will rely on the capability of the R&D community to provide cost-efficient, energy-efficient and high-performance solutions.

**Programme**

08:30h - 08:40h Welcome  
08:40h - 08:50h 5G – Connectivity for 2020 and beyond  
Erik Dahlman, Ericsson, Stockholm, Sweden  
09:25h - 10:10h RF system design and integration technologies for mmWave back- and front-haul links  
Thomas Zwick, Karlsruhe Institute of Technology, Germany  
Coffee Break  
10:50h - 11:35h Low cost mmWave antenna: a key enabler for backhaul  
CMOS/BICMOS chipset solution up to 120 GHz  
Frédéric Gianesello, STMicroelectronics, France  
11:35h - 12:20h Towards the integration of millimeter wave access points in future 5G heterogeneous networks: stakes, challenges, and key enabling technologies  
Cédric Dheos, Alexandre Siligaris, CEA-LETI, France  
12:30h - 13:50h Lunch Break  
13:50h - 14:40h mm-Wave CMOS: Paving the Path to 5G  
Ali Niknejad, University of California at Berkeley, USA  
14:40h - 15:30h Novel trends in integration and packaging technologies for RF and mm-wave front ends  
John Papapolymerou, Georgia Institute of Technology, USA  
15:30h - 16:10h Coffee Break  
16:10h - 16:55h Integrated antenna solutions for Q-band ultra-throughput wireless communications  
Yan Zhang, State Key Laboratory of Millimeter Waves, Southwest univ., China  
16:55h - 17:40h Innovative 60 GHz antenna solution for Wigig and smart eyewear applications  
Cyril Luxey, University of Nice-Sophia Antipolis, France  
17:40h - 17:50h Open discussion and concluding remarks

**WM06**

**Recent Advances in the Synthesis of Microwave Filters and Multiplexers**

Organisers:
Stéphane Bila, XLIM, Limoges, France  
Giuseppe Macchiarella, Politecnico di Milano, Italy

**Abstract**

The design of microwave filters and multiplexers usually starts with the synthesis of an equivalent circuit for determining the optimal architecture of the device. One can observe that the requirements for filtering devices in the last-generation of communication systems have broadened the area of traditional filter synthesis. In the recent years, many studies have concerned the synthesis of advanced filtering devices, such as multiband and broadband filters, compact multiplexers, and more recently synthesis of devices providing both filtering and matching.

The objective of this workshop is to provide an overview on recent advances in the field of filter and multiplexer synthesis, and to present new challenges for the next generation of filtering devices.

**Programme**

08:30h - 08:40h Welcome  
08:40h - 09:10h Coupling matrix synthesis and identification of filters with frequency-dependent couplings and finite resonator Q-factors  
Michał Mrózowski, Łukasz Szydłowski and Adam Lamecki, Gdansk University of Technology, Poland  
09:10h - 09:40h Filter synthesis through polynomial factorization  
Alejandro García-Lamperez, Universidad Carlos III de Madrid, Spain  
09:40h - 10:10h Filter synthesis on a frequency varying load. Application to multi-port synthesis and antenna matching  
Fabien Seyfert, INRIA, France  
10:10h - 10:50h Coffee Break  
10:50h - 11:00h Synthesis of multiport networks consisting of arbitrarily coupled resonators  
Giuseppe Macchiarella and Stefano Tamiazzo, Politecnico di Milano, Italy  
11:00h - 11:35h Synthesis of multi-port Butler matrix with inherent filtering  
V. Torrielli di Cresto, M. Lancaster, University of Birmingham, UK - Petronilo Martin Iglesias, ESA ESTEC, Noordwijk, The Netherlands  
11:35h - 12:00h Special filter design for SIW-SMW implementation  
Smaïn Amari, Royal Military College, Kingston, Canada – Uwe Rosenberg, Mician Global Engineering, Bremen, Germany  
12:00h - 12:25h Design of compact multiport filtering devices and subsystems  
Stéphane Bila, XLIM, Limoges, France  
12:25h - 12:30h Discussion
WM07
Recent Advances in RF/microwave Filters for Space Application

Organisers:
Petronilo Martin-Iglesias, ESA ESTEC, Noordwijk, The Netherlands

Abstract
Filters and multiplexers are key building blocks in science, navigation, and earth observation and telecommunication applications. Satellite systems are in constant evolution to answer to new and changing needs in terms of throughput, coverage, flexibility, RF performances, etc. The following bullet points offer an overview of some of the different approaches to respond to the new system requirement.

• Dielectric filters – already extensively used for low power narrow channels up to 20 GHz, are now being applied for medium/high power levels and higher frequencies too. Additionally, new topologies based on dielectric materials are helping to get more compactness for lower frequencies thanks to the very good quality of new dielectric materials.

• Reconfigurable filters – Reconfigurable filters are commonly found in satellite system studies targeting traffic flexibility between beams or reconfiguration of the channels due to the orbit reallocation of the satellite. Advances in reconfigurable filters able to cope with demanding specs and high power have been done in the last years.

• High power handling – new developments have been done to cover the demand of RF/microwave filters withstanding higher power. Solutions based on new materials, novel mode solutions and new synthesis approaches have been already presented in the last years.

• New manufacturing methods and materials – this topic is being intensively discussed nowadays. The application of new manufacturing approaches based on the additional of material supposes a breakthrough in the current RF/microwave filter design. Additional design margins can be explored together with co-simulation including electrical, mechanical and thermal issues. Additionally, new materials are being developed where, based on doping strategies, the material can be customized for electrical, mechanical and thermal perspective.
Organisers:
Georg Fischer, University of Erlangen-Nürnberg, Germany
Matthias Fehr, Co-President APWPT, Germany

Abstract
PMSE are, in particular, fundamental elements of our daily cultural life and essential tools for the 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. We would like to discuss with the participants the PMSE application, their spectrum use and impact of currently foreseeable changes in the Radio Spectrum. What decisions need to be taken at both a European and national level?

Programme
08:30h - 09:10h  Registration and get together
09:10h - 09:30h  Welcome and brief introduction in the 2nd PMSE Workshop at EuMW
Alan March, APWPT Co-President, UK

I. The application PMSE
09:30h - 10:10h  Short introduction in PMSE
Alain Richer, APWPT Co-President, France
10:10h - 10:50h  Coffee Break
10:50h - 11:20h  PMSE Standardisation within CEPT, ETSI, GRSC and ITU-R
Brian Copsey, Chairman ETSI TG17WG3, UK

II. PMSE spectrum regulation
11:20h - 11:35h  PMSE in Austria
Franz Ziegelwanger, Austrian Ministry for Transport, Innovation and Technology, Austria
11:35h - 11:50h  PMSE in France
Laurent Bodusseau, ANFR, France
11:50h - 12:05h  PMSE in United Kingdom
Helen Hearn
12:05h - 12:30h  Panel discussion
Can national PMSE regulation in the future entirely support the PMSE user requirements?
12:30h - 13:50h  Lunch Break
(APWPT invites the workshop participants for a lunch buffet)
13:50h - 14:15h  European harmonisation process for audio and video PMSE
Andreas Geiss, Head of Unit Spectrum, DG CONNECT, European Commission

III. PMSE as an object of science, study groups and manufacturers
14:15h - 14:45h  How to measure PMSE live spectrum use? Result of Spectrum Scans
Matthias Fehr, DKE AK731.0.8 & Co-President APWPT, Germany
Methodology to record the PMSE spectrum use during a number of events.
14:45h - 15:10h  Outcomes of project BMWI C-PMSE and ETSI STF386 standardisation work on cognitive radio technology for PMSE
Georg Fischer, University Nuremberg-Erlangen, Germany
15:10h - 15:30h  Analysis of changes in PMSE spectrum – our prediction for PMSE spectrum demand (audio and video)
Norbert Hilbich, Sennheiser electronic, Germany
15:30h - 16:10h  Coffee Break

IV. Effect of changes
16:10h - 16:40h  Is PMSE spectrum sharing with terrestrial broadcasting an “obsolete model”? Are there possible alternatives?
Darko Ratkaj, EBU - European Broadcasting Union, Switzerland
16:40h - 17:25h  Panel discussion
Change in PMSE spectrum their impact on culture and creative segment
17:25h - 17:40h  Closing Remarks
Alan March, APWPT Co-President, United Kingdom
17:40h - 17:50h  Meet the presenter
SCM01
High RF Power Critical Effects

Organisers:
Jacques Sombrin, TESA Laboratory, France
Jérôme Puech, CNES, France

Abstract
This short course will present the state-of-the-art in understanding RF power phenomena that detrimentally affect space, aircraft and terrestrial communications. Dramatic increase in communications capacity, bandwidth, number of carriers and antennas poses new challenges in handling the high RF power. These problems become ever more acute and critical for emerging and future RF systems.

The short course addresses the following aspects:

- Awareness of the diverse physical origins of RF power effects
- Context of RF power impact on the communications devices
- State-of-the-art in prediction (simulation), measurement and mitigation/correction of the high RF power effects
- Standardization and specifications
- Knowledge of existing means and actors in Europe

Features of the RF power effects in the space, terrestrial and aircraft communications will be discussed.

Main parts of the short course cover:

- Multipactor theory and simulation methods, test and measurement methods
- Secondary electron theory and measurement, surface conditions and conditioning
- Corona theory and simulation methods, test and measurement methods
- RF breakdown and plasma, avalanche, effect of pressure
- Passive Intermodulation theory and simulation
- Passive Intermodulation theory of distributed non-linearity, modeling and measurements
- Standardization: present and future
- Measurement means and simulation software

Programme

08:30h - 08:40h  Welcome
08:40h - 09:25h  Multipactor theory
Eden Sorolla, XLIM, University of Limoges, France
09:25h - 10:10h  Secondary electron emission yield
Mohamed Belhaj, ONERA, France
10:10h - 10:50h  Coffee Break
10:50h - 11:35h  Improvement of RF high power breakdown margins using numerical simulations
Carlos Vicente, and Vicente E. Boria, AURORASAT and Technical University of Valencia, Spain
11:35h - 12:30h  Corona theory and simulation
Vladimir Semenov, Russian Academy of Sciences, Russia
12:30h - 13:50h  Lunch Break
13:50h - 14:35h  PIM theory and simulation
Jacques Sombrin, TESA Laboratory, France
14:35h - 15:30h  Intermodulation and Nonlinear Distortion in Passive Components and Distributed Circuits
Alexander Schuchinsky and Michael Steer, Queens University Belfast, UK, and North Caroline State University, USA
15:30h - 16:10h  Coffee Break
16:10h - 16:55h  Standardization
David Raboso, ESA
16:55h - 17:40h  Measurement and simulation means
Jérôme Puech, CNES, France
17:40h - 17:50h  Open discussion and concluding remarks
Organisers:
Frédéric Barbaresco, Thalès Air Systems, France

Abstract
Since mid of last century, Radar Signal Processing problems have been formalized with classical Linear Algebra. Differential manifolds could be naturally introduced in Radar Signal Processing by considering Information Geometry theory based on seminal paper of Rao, where the Fisher Matrix defines a metric in parameters space of density of probabilities. This Fisher differential metric defines a natural “information” manifold for raw radar data. These geometric tools lead to greater insight and better Radar signal algorithms performances due to their “intrinsic” properties to solve complex problems, where classically Linear Algebra uses ad-hoc projections approaches. The tutorial will introduce these new geometries in the framework of Radar Signal Processing. These new innovative Radar Processing methods will be illustrated for different applications like joint high-Doppler-resolution and ordered statistic CFAR, ordered statistic STAP (Robust STAP), Riemannian Anti-Jamming processing, Riemannian Polarimetric data segmentation, Multi-Parameter SAR processing, Non-linear tracking and Non-stationary signals processing.

References:
http://www.mdpi.com/1099-4300/16/8/4521/pdf
Abstract
Electromagnetic wave scattering from random rough surfaces is an active, interdisciplinary area of research with countless practical applications in fields such as optics, acoustics, geoscience and remote sensing. In the last four decades, considerable theoretical progress has been made in elucidating and understanding the scattering processes involved in such problems. Numerical simulations allow us to solve the Maxwell equations exactly without the limitations of asymptotic approaches, whose regimes of validity are often difficult to assess. The objective of this course is to present both asymptotic approaches, such as the Kirchhoff approximation, and numerical methods, such as the Method of Moments (MoM), in order to solve the scattering from rough surfaces.

In part I, the MoM is presented to solve the boundary integral equations. The formulation is extended to the case of a rough layer (2 rough interfaces separating homogeneous media). This part also presents the necessary statistical parameters to generate a one-dimensional random rough surface such as a sea surface.

In part II, the MoM, presented in part I, is tested on a cylinder of infinite length along one direction. In addition, the MoM is compared with the physical optics (PO) approximation for the scattering from an elliptical cylinder, a plate and a one-dimensional rough surface.

In part III, the numerical tools presented in parts I and II are applied for 2D problems to the Radar scattering from sea surfaces and in the GPR context.

In part IV, several asymptotic models for calculating the field scattered by random rough surfaces are presented, and a focus is made on the Kirchhoff-tangent plane (or PO) approximation. Then, the coherent and mainly incoherent contributions to the NRCS (normalized radar cross section) are calculated, for both two-dimensional (2D) and three-dimensional (3D) problems.

In part V, applications for both 2D and 3D problems to sea surfaces and to GPR problems are presented.
WW01
Opening Ways for Exploring New Maritime Radar Applications using High-Level Modeling

Organisers:
Christian Cochin, DGA, France
Jean-Christophe Louvigne, DGA, France

Abstract
This workshop aims to explain and debate how new computing techniques can open opportunities to develop innovative radar processing techniques. GPU computing applied to radar signal generation has shown that it is possible to simulate, in quite real time, a dynamic sea with ships in motion.

Concerning target simulation, the use of a dynamic sea surface is a way to simulate realistic motions and sea-structure coupling phenomena. The drawbacks of uncertainties associated to real acquisitions can, for a part, be overcome by the perfect knowledge on the “ground truth”. These advanced simulation approaches permit to develop and validate:
- Processing techniques such as motion compensation or focusing algorithms for moving targets based on ideal situations and then study and improve robustness while adding more and more realistic phenomena encountered in operational conditions.
- Explore new fields like target classification based on CAD models.

Concerning maritime radar clutter, the use of a physical model for the sea is an outstanding disruptive concept, as it permits to overcome some drawbacks of statistical models that cannot handle in a satisfactory way the spatial complexity of real situations. It also closely relates complex EM phenomena, such as breaking wave phenomena and spikes to surface conditions.

This workshop aims, considering these examples, to open discussions about state of art in maritime scene simulation and the possible uses by radar experts.

Programme
13:50h - 14:00h Welcome and Introduction of the challenge of new modelling technics for radar studies
Christian Cochin, DGA, France

14:00h - 14:20h Radar raw data simulation of a ship with its motions to study robustness of ISAR algorithms - simulation
Corentin Le Barbu, Alyotech, France; Marco Martorella, Pisa University, Italy

14:20h - 14:40h Radar raw data of a ship simulation with its motions to study robustness of ISAR algorithms - processing
Marco Martorella, Pisa University, Italy; Corentin Le Barbu, Alyotech, France

14:40h - 15:10h Questions and discussions

15:10h - 15:30h Classification of ships using SAR or ISAR imagery and model based approach and MOCEM simulation
Luc Vignaud, ONERA, France; Nina Odegaard, FFI, Norway

15:30h - 16:10h Coffee break

16:10h - 16:30h Radar raw data generation of sea clutter using PHYSIQ V1 and comparisons to other approaches and measurements - simulation
Julien Houssay, Nicolas Pinel, Goulven Monnier, Alyotech, France; Keith Ward, Igence UK

16:30h - 16:50h Radar raw data generation of sea clutter using PHYSIQ V1 and comparisons to other approaches and measurements - comparisons
Keith Ward, Igence, UK; Nicolas Pinel, Julien Houssay, Goulven Monnier, Alyotech, France

16:50h - 17:20h Questions and discussions

17:20h - 17:50h Use of precomputed and real time computed signals in a disruptive radar performance analysis tools.
Nicolas Trouvé, ONERA, France
Abstract
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 relaying 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.

Organisers:
Piero Angeletti, European Space Agency
Giovanni Toso, European Space Agency

Programme
13:50h - 14:00h Welcome
14:00h - 14:40h Fundaments of Multibeam Antennas
Piero Angeletti, European Space Agency
1. Overview of Multibeam Antennas and system requirements:
   - Satellite Communication Systems;
   - Wireless Communications;
   - RADARs.
14:40h – 15:30h Multibeam Antenna Architectures (Part 1)
Giovanni Toso, European Space Agency
2. Reflector-based architectures:
   - Single-Feed-per-Beam;
   - Multiple-Feed-per-Beam.
15:30h - 16:10h Coffee Break
16:10h – 16:40h Multibeam Antenna Architectures (Part 2)
Giovanni Toso, European Space Agency
3. Linear and Planar Direct Radiating Arrays (based on Periodic or Aperiodic lattices)
4. Lens-based architectures (free space and constrained)
16:40h - 17:20h Beamforming Networks
Piero Angeletti, European Space Agency
5. Analog Beamforming Networks:
   - Corporate divider/combiners;
   - Blass and Nolen matrices.
   - Butler matrices.
6. Digital Beamforming Networks
17:20h - 17:40h Applications of Multibeam Antennas
Piero Angeletti, European Space Agency
7. Overview of some Operational Multibeam Antennas/BNFs:
   - MBAs for Spaceborne Narrowband and Broadband Satellite Communication Systems;
   - MBAs for Wireless Communications.
8. On-going European Developments and Current Design and Technological Challenges
17:40h - 17:50h Discussion

www.eumweek.com | 93
Organisers:
Marc Lesturgie, ONERA, France

Abstract
MIMO (multiple-input and multiple-output) radar refers to the use of multiple transmitters and receivers, for sensing the environment and the targets present in this environment. Basically MIMO radar uses multiple antennas that transmit correlated or uncorrelated waveforms. For the last ten years MIMO has led to extensive research and publications, both in communications and Radar domains. Why such interest for MIMO in radar? Beside the prolific amount of publications, how to assess the interest of MIMO to overcome the current limitations of conventional radar?

The short course attempts to answer these questions, as well as to provide the tools to understand the link between theoretical considerations and radar system design. After a summary of the state of art – we may notice that MIMO was invented more than 25 years ago – the course will provide the fundamentals of MIMO radar, how to define a MIMO radar configuration, introduce the signal model, waveform design, signal processing, detection and localization. A particular emphasis will be put on the coherent MIMO in conjunction with the unique properties of the MIMO steering vector. A large part of the course will be focused on practical applications, realization of MIMO, including GMTI applications and French and Chinese experiences on low frequency radar for air and maritime surveillance.

Programme
08:00h - 08:40h Welcome
08:40h - 10:10h MIMO Radar: from principles to practical and useful applications (Part 1)
Marc Lesturgie, ONERA, France
1.Introduction
State of art, MIMO system in navigation, communication and radar domain;
Flashback to the first MIMO radar, RIAS (SIAR), its advantages and drawbacks.
2.MIMO configurations
Definition of MIMO; MIMO and radar diversity;
Examples of application benefit of MIMO over conventional radar systems,
3.Signal model and performances
Power budget of MIMO system, examples of codes,
Fast or slow time coding, which code for which application?
MIMO and antenna coupling in physical arrays
Properties of the transmitted pattern
4.MIMO waveform design for radar applications
Waveform schemes: fast time CDMA, FDMA, TDMA, DDMA...
Examples of codes: sub-carriers, OFDM codes, PN (pseudo-noise), Hadamard codes

10:10h - 10:50h Coffee Break

10:50h - 12:20h MIMO Radar: from principles to practical and useful applications (Part 2)
Marc Lesturgie, ONERA, France
5.Signal processing
MIMO signal chain; mathematic formulation
Estimation of the steering vector
Impact of the Doppler shift on signal processing
Detection scheme (Gaussian / non Gaussian noise)
6.Properties of the MIMO steering vector
Virtual array / Combined transmit and receive array directivity
MIMO and high resolution techniques
7.Relevant applications of MIMO to radar
Bistatic / Multistatic GMTI/STAP
Low frequency HF radar
Other applications (including real systems and experimental results)

12:20h - 12:30h Discussion
Connect with the Experts

Keysight Technologies’ test, measurement and software solutions have enabled electronic and communication advancements since 1939. Again this year at European Microwave Week, our ‘Connect with the Experts’ workshops will allow you to meet Keysight’s industry experts and engage with them around four major topics which are critical for the EuMW delegates:

- Radar and Electronic Warfare Applications
- Material and Component Characterization
- RF & uW Circuit Design
- Millimeter Wave and Terahertz Technologies and Systems

If you would like to register to attend any of these workshops, please visit www.keysight.com/find/EuMW 2015.

Tuesday September 8th 13:30h – 17:15h  
Radar and Electronic Warfare Applications

Productive and efficient engineering of radar and electronic warfare (EW) systems requires the generation of test signals that accurately and repeatably represent the radar or EW environment. Simulation of multi-emitter environments, in particular, is vital to ensure realistic and representative testing. This workshop will explore the available technological approaches for radar and EW signal and environment simulation as well as analysis measurement techniques. This will include recent innovations in digital-to-analog converters (DACs), direct digital synthesis (DDS) signal generation, wideband generation and analysis, and MIMO applications in passive radar test.

Wednesday September 9th 09:30h – 13:15h  
Material and Component Characterization

From stealth materials to dielectric substrates, microwave food products to biofuels, accurate characterization of their electromagnetic properties at microwave and mm-wave frequencies provide engineers with critical information needed for material and circuit design, modeling, research, manufacturing and quality control. This workshop will provide an overview of the state-of-art techniques used to measure the impedance and the dielectric properties of materials that are widely incorporated into microwave devices and components. We will start from the basis of measuring the impedance of components and material following an overview of the most relevant techniques used to measure large range of materials from a few MHz to THz. We will also look at the new techniques to measure impedance at nanoscale and at very high frequencies.

Wednesday September 9th 13:30h – 17:15h  
Millimeter Wave to Terahertz Technologies and Systems

With the finite available spectrum and attributes such as atmospheric windowing and reduced aperture size, the use of millimeter-wave frequencies is gaining interest in applications that range from imaging radar to wideband communications. As applications move to higher frequencies to support increased modulation bandwidth and seek out an uncrowded spectrum, measurement challenges increase dramatically. Keysight’s existing test solutions, including signal generators, analyzers, and network analyzers, can be combined with extender modules from Keysight solution partners in order to generate and analyze complex signals ranging from millimeter-wave to terahertz. This workshop will cover relevant upconversion and downconversion procedures as well as special considerations for signal generation and analysis of wideband radar imaging waveforms and vector-modulated communication signals.

Thursday September 10th 09:30h – 13:15h  
RF & uW Circuit Design

Industry trends continue toward smaller form factors and more functionality in low cost packages, including mixed technology components such as MMICs, RFICs, discrete components, antennas and multi-layer packaging. This workshop will show how to design a multi-technology RF power amplifier module and integrated circuit packaging design using the latest ADS 2015.07. Topics covered include: Schematic – Layout concurrent design, ElectroMagnetic / Electric co-simulation, module design approach, bringing in multiple technologies, routing, inductor design, electro-thermal verification, and Integrated Packaging Design Flow.
Rohde & Schwarz Workshops

- Free to attend -

For more information, details and registration:
http://www.eumw.rohde-schwarz.com/

Location: Salle Passy on Level 1

Tutorial Seminars - RF Basics in Test & Measurement

Tuesday 8th September 2015  09:30h – 11:00h 
Fundamentals of Signal Generators and Oscillators (YIG vs. VCO)
During this session, the fundamental concept of an RF and microwave generator will be discussed. Attendees will learn about YIG- and VCO-based synthesizers and how a signal with a constant output power is generated. To set a specific low output power on a signal generator, an internal step attenuator is used. The concepts of mechanical and electronic step attenuators as well as their advantages and limitations will be shown in detail. Typical specifications for modern signal generators as well as the realization of fundamental analog modulations will be discussed.

The following topics are covered:
• Synthesizer concepts for RF and microwave generators • Comparison of YIG-based and VCO-based synthesizers • How to achieve low phase noise and high output power • Challenges of low phase noise and high output power • Principles of analog and pulse modulations • Fundamental specifications of RF and microwave generators

Tuesday 8th September 2015  12:00h - 13:30h 
Fundamentals of Spectrum Analysis
One of the most frequent measurement tasks in RF and radio communications is the examination of signals in the frequency domain. The instrument that is best suited for this assignment is a spectrum analyzer, one of the most versatile and widely used RF measuring instruments. A versatile, state-of-the-art spectrum analyzer provides a large number of setting parameters in order to handle the steadily rising requirements in the RF and microwave world.

The following topics are covered:
• Signals and their spectra • Block diagrams of modern spectrum analyzers • Theory of operation of super heterodyne analyzers • Understanding resolution bandwidth (RBW) • Understanding video detectors and the use of the video filter (VBW) • Use of the different detectors in the spectrum analyzer • Frequency accuracy and trace processing • Boundaries and uncertainty of the measurement • Applications • Classical measurements with a spectrum analyzer

Tuesday 8th September 2015  14:45h – 16:15h 
Fundamentals of Power Measurements (Power Sensors and Applications)
In this tutorial seminar, we give a brief introduction of the term power and clarify how power is measured. This is followed by an overview of the various power sensors that are available to measure and analyze various aspects of a RF/microwave signal, e.g. pulses, overshoots and level transitions, modulated signals and their envelope characteristics.

The final part introduces some power measurement applications in various business environments, such as automotive testing, wireless communications, production and aerospace and defense. The following topics are covered:
• Introduction • Power of CW signals • Pulse power measurements • Crest factor • Two types of sensors: terminating and directional • Thermal power sensors • Multipath diode sensors • Universal wideband power sensors • USB power sensors – standalone capabilities • USB power sensors – applications

Wednesday 9th September 2015  13:30h – 15:00h 
Fundamentals of Vector Network Analysis
Sophisticated and precise vector network analysis is indispensable in developing advanced, miniaturized RF equipment such as filters and amplifiers. By measuring the transmission and reflection parameters (S-parameters) of the individual components of an overall system, network analysis allows you to ideally match these parameters, thus ensuring optimum functioning of the system. Correction methods are used to achieve high measurement accuracy.

The following topics are covered:
• Basic terminology in network analysis • Frequency response • Typical effects and conclusions • S-parameter • Setup and functioning of network analyzers • Introduction to calibration • Basic applications • Practical examples

Wednesday 9th September 2015  15:45h – 16:45h 
Calibration in Vector Network Analysis
Beside the hardware and accessories used in the network analysis set up, the calibration method and the calibration kit used directly influence the measurement result. To enhance the measurement accuracy, the fundamental calibration methods of network analyzers correct so-called systematical errors. This lecture will show how to perform a calibration as well as the differences between different calibration methods with respect to the necessary measurement accuracy and the application.

The following topics are covered:
• Calibration procedures and their uses • Typical measurement errors • Normalization • One-path, two-port • Full one-port calibration • Full two-port calibration • Definition of calibration standards • Practical examples

Tutorial Seminars – Digital Modulation Basics in Test & Measurement

Wednesday 9th September 2015  09:30h – 11:00h and 11:45h – 12:45h (with coffee break)
Introduction to Digital Signals and Digital Modulation
This tutorial seminar will show the evolution of RF signals, from analog-modulated RF signals to digitally modulated RF signals. We will introduce the principle of the communications path, from coding, mapping, modulating and transporting the signal over the air interface to demodulating, decoding, de-mapping and reshaping the information in the receiver.
The following topics are covered:
• Transmission of information – source coding, channel coding and modulation • Analog modulation of RF carriers • Digital modulation of RF carriers • Symbol and symbol rate • Higher order modulation – types of modulation (GMSK, BPSK, QPSK, QAM) • Mapping – effects due to coding • Baseband filtering • Channel capacity • Channel coding with forward error correction (FEC) • Multiple access systems – FDMA, TDMA, CDMA • Measurement parameters in digital modulation

Thursday 10th September 2015 09:30h – 11:00h
Understanding Fading and its Effects
In this tutorial session, we uncover the physical phenomena of fading to show what multipath propagation is and what their relevant physical effects, such as reflection, refraction and scattering. The following topics are covered:
• Motivation to speak about fading • Physical phenomena of fading • What is multipath propagation and what are the effects • Typical influences of multipath propagation • Fading – what physical effects are at work here • Types of fading • Pure Doppler fading • Rayleigh fading • Ricean fading • Wannerton fading • The microwave link

Technical Workshops

Tuesday 8th September 2015 11:15h – 12:00h
Pulse Generation for Radar Applications
In the A&D domain, high flexibility is required for signal generation. The most prominent application area is radar with its various test cases for different radar types. These applications address all types of pulsed signals, from simple CW pulses to complex concatenation of vector-modulated pulses. Within this workshop session, the major testing requirements are revisited and demonstrated based on real-world scenarios. The following topics are covered:
• Setup of simple pulses, pulse trains and emitter signals of radar systems • Scenario emulation with integrated antenna patterns and antenna scans • Typical modulation types, sequencing concepts and more complicated setups of multiple emitters • Automatic configuration of instruments according to emulation scenario

Tuesday 8th September 2015 16:15h – 16:45h
LAN Enabled Power Measurements
New power sensors, that offer, in addition to USB, the capability to control the sensors via LAN, allow remote monitoring of a system over large distances using a power over Ethernet (PoE) switch. The three-path diode LAN power sensors are suitable for numerous applications since they support continuous average, burst average, timeslot average, gate average and trace measurements. In this workshop, the concepts of fast and accurate power measurements are introduced and demonstrated using a state-of-the-art LAN sensor. The following topics are covered:
• Fast and accurate power measurements for CW and modulated signals (dynamic range of –70 dBm to +23 dBm) • Enhanced triggering with built-in trigger I/O port and up to 10 000 triggered measurements/s • Faster measurements with up to 50 000 readings/s • Web client for web browser operation

Tuesday 8th September 2015 16:45h – 17:30h
WLAN 802.11ad and 5G – Vector Signal Generation and Spectrum/Modulation Measurements in the 60 GHz Band
The increasing data rates found in HD streaming and other applications drive the WLAN standard to cover a wider bandwidth like 2 GHz, which is only available in the microwave range. The WLAN 802.11ad standard for very high throughput (6.75 Gbps), short-range transmissions of a few meters is available in the 57 GHz to 66 GHz frequency range. 5G is a name used in some research papers and projects to denote the next major phase of mobile telecommunications standards beyond the upcoming 4G standards, where similar frequency and bandwidth ranges are discussed. Generation of signals for such high frequencies can be addressed using a vector signal generator together with an additional upconverter unit. Spectrum measurements such as the spectrum emission mask measurement and adjacent channel leakage ratio are challenging in these frequency bands. An analyzer is needed where the spectrum is unambiguous, without unwanted mixing products or images. Preselection up to 85 GHz helps here as do internal attenuator stages to adjust the input level at the downconverter for maximum dynamic range. In addition, the measurement of modulation accuracy of the signal makes a wideband signal capture (1.76 GHz in the case of WLAN 802.11ad) necessary to calculate EVM performance. All these requirements are covered by modern signal analyzers in combination with digital oscilloscopes. The following topics are covered:
• Wideband signal analysis • What is behind WLAN 802.11ad • 5G requirements and technology options • Vector signal generation between 56 GHz and 67 GHz • One-box solution for spectrum analysis up to 67 GHz or 85 GHz
**Modern Methods of Phase Noise Testing**

In this session, the fundamental concepts and ideas of measuring phase noise parameters on a wide range of devices under test (VCXO, OCXO, etc.) is introduced and demonstrated using a state-of-the-art phase noise analyzer and a signal and spectrum analyzer. The combination of an analyzer with a very good internal reference signal source, high-performance analog-to-digital converters, and sophisticated algorithms such as cross-correlation results in a measurement tool for all modern phase noise measurement needs. The following topics are covered:

- Fundamental concepts of RF and digital processing related to phase noise
- Cross-correlation technique for increasing dynamic range
- Special phase noise measurement functions – spot noise, residuals, spurs, limits
- AM suppression and AM noise measurement

**Phase Noise Measurement of Pulsed Signals**

Phase noise is one of the most crucial parameters in radar systems. The performance of the oscillators in the system influences the range and Doppler resolution. The detection performance of the radar system and its fixed target suppression is also mainly determined by the oscillator performance. This makes phase noise measurement for these applications very important. In this session, the fundamental concepts and ideas of measuring pulsed phase noise are introduced and demonstrated using a state-of-the-art phase noise analyzer. The following topics are covered:

- Phase noise influences in radar and measurement needs
- Fundamentals of pulsed signals
- Cross-correlation technique for increasing dynamic range
- Phase noise of pulsed signals

**Phase Noise Measurement with Spectrum Analyzers**

Measuring phase noise with a general-purpose spectrum analyzer is discussed in this session. Due to the excellent internal phase noise performance, recording of baseband I/Q data and today’s digital signal processing possibilities, a lot of tasks formerly addressed only by phase noise analyzers can now be covered with a spectrum analyzer and a phase noise measurement software option. The same measurement software can also be used on mid-range instruments to cover measurements with lower phase noise requirements. The following topics are covered:

- Quick introduction to phase noise
- Software concept, DSP details
- Phase noise measurements (spurs, residual noise, spot noise, AM rejection)
- Tracking/digital PLL and measurement performance

**Insight into Nonlinear Device Characterization**

From Modeling and Waveform Engineering to Active Harmonic Load Pull Systems – in cooperation with **mesuro**

Increasing the efficiency of active components such as amplifiers is becoming more and more important in today’s communications systems. To accomplish this, $S$-parameter characterization has to be supplemented by nonlinear device characterization. This workshop gives an overview of the different nonlinear solutions available from Rohde & Schwarz and Mesuro.

**Configurable Signal Conditioning for Network Analyzers**

Getting Complete Amplifier or T/R Module Characterization with a Single Connection – in cooperation with **mesuro**

Amplifiers and, in particular, complex devices such as receivers, transceivers and T/R modules require a large number of test parameters and different test setups for complete characterization. This workshop presents solutions for T/R module tests based on the R&S®ZVA network analyzer. The equipment can be tailored to individual requirements, and components such as internal combiner or pulse modulators can be added as separate options and controlled during the test sequences.

**Economical High-End Multiport Solutions**

Increasing demands in mobile communications or even in component testing for radar and surveillance systems require an increased number of test ports, high RF performance and short measurement times. Thanks to its 4 to 24 integrated test ports, the R&S®ZNB8 network analyzer features unrivaled RF properties and test time. The RFFE/MIPI GPIO interface allows direct control of integrated semiconductor devices, mainly frontends of mobile phones. Automatic calibration units with up to 24 ports are the basis for economic and accurate multiport calibration.
National Instruments Workshop:
PA Forum

- Free to attend -

Location: Room 111-112-113 on Level 1

Date and Time: Wednesday, 9 September, 09:30h - 13:00h
Title: RF and Microwave Power Amplifier (PA) Forum
Hosted By: National Instruments
Who Should Attend: Engineers and researchers

The second annual EuMW ‘RF and Microwave PA Forum’ will focus on device technologies, characterization, modeling and end-use applications of RF and microwave PAs. The forum aims to foster discussion and provide insight into the latest approaches to device models, parameter extraction measurement techniques, process technologies as well as modern PA design flow and theory.

The forum’s agenda is broken into sequential sessions on above listed topics to allow attendees to selectively attend any/all presentations of interest.

View the agenda and register:
awrcorp.com/EuMW2015

National Instruments Workshop:
NI AWR Software Forum

- Free to attend -

Location: Room 111-112-113 on Level 1

Date and Time: Wednesday, 9 September, 13:30h - 17:00h
Title: AWR Design Forum (ADF) - NI AWR Design Environment User Group Meeting
Hosted By: National Instruments
Who Should Attend: NI AWR software user

ADF - NI AWR Design Environment User Group Meeting is scheduled for Wednesday, 9 September. Spend time to learn about NI tools (software & hardware) that span design through to test for RF and microwave circuits, systems and subsystems.

The event will focus on RF and microwave design and showcase the NI AWR Design Environment™ product portfolio of EDA design tools that consists of Microwave Office, Visual System Simulator™, AXIEM and Analyst™ as well as co-simulation with LabVIEW. Customers and partners will also be presenting how they use these software solutions to realize their end product design.

For agenda and registration visit:
awrcorp.com/EuMW2015
Anritsu Workshops
- Free to attend -

Location: Room 101 & 102 on Level 1

Wednesday 9th Sept, 10.00h – 10.40h
Compact E-Band VNA with Reduced Complexity
Nonlinear transmission line technology enables compact millimeter-wave VNA architectures with enhanced performance and flexibility. We will discuss these architectures in the context of E-band measurements, and show that the resulting systems reduce complexity and enhance efficiency in a variety of measurement scenarios.

Wednesday 9th Sept, 11.00h – 11.40h
5G Measurements using a Vector Network Analyzer Including Error-corrected Modulated Carrier Analysis – MMD
5G wireless systems will provide high data rate with maximized carrier efficiency. Ideally, measuring the efficiency of a 5G network system, subsystem, and components is best when a calibrated VNA can be used to analyze active devices stimulated by a modulated carrier. Modulation rates of 5G systems are expected to be 200 MHz and higher. This workshop describes how a modulated carrier signal with up to 200 MHz modulation rate can be captured by a calibrated VNA and provide corrected display of the frequency spectrum.

Wednesday 9th Sept, 13.00h – 13.40h
Measuring IMD Properties of Active Devices Using a High Performance IP3 Receiver for Improved Accuracy – MMD
Intermodulation distortion (IMD) has become an important measurement during the design of RF and microwave amplifiers. This workshop discusses the different configurations available in a VNA for setting up accurate IMD measurements, including the ability to perform single-connection S parameter and IMD measurements without the need for external sources or combiners.

Wednesday 9th Sept, 14.00h – 14.40h
Performing On-wafer 145 GHz 0.8 mm connector Differential VNA Measurements with a Single Connection
Differential devices are becoming more common as communication system demands and performance requirements continue to rise. This workshop discusses the different system architectures available for differential on-wafer measurements and the advantages of tightly integrated VNA architecture for improved system dynamic range and measurement stability.

Wednesday 9th Sept, 15.00h – 15.40h
ShockLine VNA based Planar Near-Field Measurement System (PNMS) systems
NFS measurement systems can be realized with relatively low material costs since they neither need as much room as a comparable far-field system nor require custom-made mirrors as this is the case for compact ranges. This workshop explains and benchmarks the general working principle of an inexpensive PNMS. We will discuss PNMS issues and weaknesses, and approaches to resolution.

EuMW MICROAPPS 2015
- Free to attend -

New Venue: MicroApps Auditorium is now located inside the Exhibition area in the TERNES hall.

Welcome to the fifth annual European Microwave Week Microwave Application Seminars (MicroApps). MicroApps will be held from Tuesday, 8 September through to Thursday, 10 September 2015.

MicroApps are sponsored by National Instruments, Rohde & Schwarz and Horizon House and will take place in the MicroApps Auditorium, which is located within the TERNES hall (adjacent to the exhibition floor), making it a convenient stop while visiting the EuMW show.

During MicroApps, EuMW exhibitors will present 20 minute long technical presentations describing state-of-the-art applications, products, design techniques, and processes of interest to the RF and microwave community.

These free-to-attend sessions provide engineers with insight into products and techniques that aid them with their everyday work.

MicroApps Highlights
• A wide range of practical application topics describing novel products and processes.
• Keynotes presented by leading industry persons.
• NEW for 2015: A quieter MicroApps auditorium that’s easily accessible from the Exhibition floor.
• Exhibition Only Badges or Conference Badges for free and ready access.
• A complimentary USB containing MicroApps presentations.

We hope to see you at EuMW MicroApps 2015!

MicroApps Committee

P.S. Once finalized, a complete agenda will be posted on the EuMW MicroApps website: www.eumicroapps.com as well as published within the official EuMW Show Guide. Additional printed copies will also be available at the EuMW registration desks.
**CONFERENCE SESSIONS MATRIX - SUNDAY**

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<td>W502 EuMC: 100 Gbit/s Wireless Communications at High mm-Wave Frequencies</td>
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<td>W509 EuMC: Microwave Measurements and Electromagnetic Simulations of Printed Circuit Boards (PCBs) for High Speed Digital and Radio Frequency (RF) Applications</td>
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<td>W510 EuMC: Transceiver/IF Structures and Modelling for Wideband and SDR Systems</td>
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<td>SC503 EuMC: Design by Mathematics of Full Software Radio Circuits and Systems: Methodology and Application to 5G Standard</td>
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</tbody>
</table>

**Sessions**

- **EuMC** - European Microwave Conference
- **EuMIC** - European Microwave Integration Conference
- **EuMW** - European Microwave Week
- **EuRAD** - European Microwave Radar Conference
- **SCS** - International Conference on Scientific Computing in Electrical Engineering

**Rooms**

- Room 202-203
- Room 212-213
- Room 243
- Room 221M + 222M
- Room 231M + 232M
- Room 234M + 235M
- Room 124M + 125M
- Room 134M + 135M
- Room 111-112-113
- Room 101-102-103
- Room 10M-11M-12M-13M-14M-15M

**Sessions Details**

- **WS01 EuMC**: Sensors Towards Terahertz: Novel Technologies for Potential “THz Killer Applications” in Life Sciences and Spectroscopy
- **WS02 EuMC**: 100 Gbit/s Wireless Communications at High mm-Wave Frequencies
- **WS03 EuMC**: Technologies Overview for mm-wave Tunable Circuits
- **WS04 EuMC**: Latest Developments in GaN PA Technologies and Techniques
- **WS05 EuMIC**: GaN Technology for Space Applications
- **WS06 EuMC**: Recent Advances on High Performance Reconfigurable Filters
- **WS07 EuMIC**: RF-Technologies on the Move: The Races of Integrated mm-Wave Automotive Radar and Sensing Technologies
- **WS08 EuMC**: Microwave Characterization of Nanoscale Devices
- **WS09 EuMC**: Microwave Measurements and Electromagnetic Simulations of Printed Circuit Boards (PCBs) for High Speed Digital and Radio Frequency (RF) Applications
- **WS10 EuMC**: Transceiver/IF Structures and Modelling for Wideband and SDR Systems
- **WS11 EuMC**: Far-field Wireless Power Transmission
- **WS12 EuMIC**: SiGe for mm-Wave and THz
- **SCS01 EuMC**: Nonlinear Microwave Circuit Design: The Basics of Computer Aided Nonlinear Microwave Circuit Design
- **SCS02 EuMC**: Fundamentals of Microwave Power Amplifier Designs
- **SCS03 EuMC**: Design by Mathematics of Full Software Radio Circuits and Systems: Methodology and Application to 5G Standard
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<th>Coffee Break</th>
<th>16:10h-17:50h</th>
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<tr>
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<td>EuMIC01 III-V HEMT based Millimeterwave and THz Integrated Circuits</td>
<td>EuMIC05 Millimeterwave Frequency Multipliers and Dividers</td>
<td>EuMIC07 CMOS-based Millimeterwave Integrated Circuits</td>
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<td>Maillot</td>
<td>EuMIC02 Fully Integrated Power Amplifiers in GaN, GaAs and SiGe</td>
<td>EuMIC04 OPENING</td>
<td>EuMIC03 GaN Based Power Amplifiers</td>
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<tr>
<td>Room 242A</td>
<td>EuMIC03 High Frequency Characterisation and Modelling</td>
<td>EuMIC06 CMOS-based Millimeterwave Integrated Circuits</td>
<td>EuMIC08 CMOS Building Blocks</td>
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<td>Room 242B</td>
<td>WM01 EuMC Fundamentals and Engineering Considerations of Terahertz Technologies from Devices to Applications</td>
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<td>WM02 EuMC Using Symmetry-Related Electromagnetic Properties for Microwave Device Design: Application to Half-Mode Circuits, Balanced Lines and Circuits and Microwave Sensors</td>
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<td>WM03 EuMC Bio-ElectroMagnetism for Biological and Medical Applications: Latest Developments on Implantable Micro-Devices, Sensing Concepts and Modelling Approaches</td>
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<td>WM04 EuMC Millimeter-wave Multilayer MCM/SoP and Heterogeneous Integration Techniques</td>
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<td>WM05 EuMC Millimeter-Wave Technologies for 5G Mobile Networks</td>
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<td>WM08 EuMC Current and Future Use of Spectrum by PMSE</td>
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<td>SCM01 EuMC High RF Power Critical Effects</td>
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**CONFERENCE SESSIONS MATRIX - MONDAY**
# CONFERENCE SESSIONS MATRIX - TUESDAY

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<th>16:10h-17:50h</th>
<th>18:00h-18:30h</th>
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<td>EuMIC10</td>
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<td>EuMC07 Focus Session on Advances in THz and Opto-Nanoelectronics</td>
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<td>EuMC05 Power Amplifier Architectures</td>
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<td>EuMC05</td>
<td>EuMC12 Low Noise Amplifiers and Oscillators</td>
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<td>EuMC/EuMIC06 Tunable and Reconfigurable Filters and Impedance Matching Techniques</td>
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<td>EuMC/EuMIC06</td>
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<td>EuMC09 Nanoscale Characterization and On-Wafer Calibration</td>
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## CONFERENCE SESSIONS MATRIX - WEDNESDAY

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<th>16:10h-17:50h</th>
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<tr>
<td>Room 243</td>
<td>EuMC21 Microwaves in Biological and Medical Applications</td>
<td>EuMC34 Nonlinear Measurements and Models</td>
<td>EuMC41 SW Filters and Related Structures</td>
<td>EuMC/EuRAD02 UWB Antenna Systems</td>
<td>EuMC35 Focus Session on Advance in Scanning Probe Microwave and mm-wave Microscopy</td>
<td>EuMC/EuRAD03 Focus Session on 3D SAR Imaging of Complex Environments</td>
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<td>Room 251</td>
<td>EuMC22 Millimeter Wave Circuits</td>
<td>EuMC28 Front-end Subsystems</td>
<td>EuMC37 Temperature Sensing and Modelling</td>
<td>EuMC23 Advanced Technologies for Planar, Tunable and Acoustic-Wave Filters</td>
<td>EuMC29 Design Techniques for Planar Microwave Filters</td>
<td>EuMC42 Hyperthermia Applications</td>
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<td>Room 252A</td>
<td>EuMC24 Millimeter-Wave Imaging</td>
<td>EuMC30 Millimeter-Wave Systems</td>
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<td>Room 253</td>
<td>EuMC28 Front-end Subsystems</td>
<td>EuMC35 Focus Session on Advance in Scanning Probe Microwave and mm-wave Microscopy</td>
<td>EuMC40 Microwave Measurement Methods and Material Characterization</td>
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<td>EuMC29 Design Techniques for Planar Microwave Filters</td>
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<td>EuMC31 Integrated Antennas</td>
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<td>EuMC/EuRAD05 Printed Antennas</td>
<td>EuMC24 Millimeter-Wave Imaging</td>
<td>EuMC30 Millimeter-Wave Systems</td>
<td>EuMC/EuRAD03 Antenna System Assessment for Radar and Communication Applications</td>
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<tr>
<td>Room 202 + 203 &amp; 212 + 213</td>
<td>SCW01 EuRAD Geometric Radar Processing Breakthrough Based on Fisher Information Geometry</td>
<td>SCW02 EuMC Multibeam Antennas and Beamforming Networks</td>
<td>SCW03 EuRAD Radar Electromagnetic Scattering Modelling From Random Rough Surfaces</td>
<td>WW01 EuRAD Opening Ways for Exploring New Maritime Radar Applications Using High-Level Modeling</td>
<td>EuMC26 Passive Power Dividers 2</td>
<td>EuMC35 Focus Session on Advance in Scanning Probe Microwave and mm-wave Microscopy</td>
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**Legend:**
- EuMW
- EuMC
- EuMIC
- EuRAD
- Joint EuMC/ EuMW
- Joint EuMC/ EuMIC
- Joint EuMC/ EuRAD
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<tr>
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<td>EuMC47 Flexible Stretchable and Printed technology</td>
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<td>EuMC/EuRAD06 Array Antennas - Design &amp; Concepts</td>
<td>EuMC/EuRAD08 Array Antennas - Implementation</td>
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<td>Room 242A</td>
<td>EuMC44 Wide-band, Multi-band and Multi-Mode Planar Filters</td>
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<td>Room 243</td>
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<td>EuMC/EuRAD09 Antenna Arrays and Beam Scanning</td>
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<td>EuRAD13 Advanced Radar Processing Techniques</td>
<td>EuRAD16 Automotive and Millimetre-wave Radar</td>
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<td>Room 242B</td>
<td>EuRAD14 Focus Session on Advanced Modelling, Processing and Inversion</td>
<td>EuRAD17 Focus Session on Measurement and Processing Techniques for System Diagnostic and Calibration</td>
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<td>Room 243</td>
<td>SCF01 EuRAD MIMO Radar: From Principles to Practical and Useful Applications</td>
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**Room 241**
- **EuRAD12**: Innovative Radar Architectures and Technologies
- **EuRAD15**: New Radar Architecture and Enabling Technologies
- **EuRAD18**: Closing

**Room 242A**
- **EuRAD13**: Advanced Radar Processing Techniques
- **EuRAD16**: Automotive and Millimeter-wave Radar

**Room 242B**
- **EuRAD14**: Focus Session on Advanced Modelling, Processing and Inversion Applied To Ground Penetrating Radar
- **EuRAD17**: Focus Session on Measurement and Processing Techniques for System Diagnostic and Calibration

**Room 243**
- **SCF01 EuRAD**: MIMO Radar: From Principles to Practical and Useful Applications
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<td>Salle Passy on Level 1</td>
<td>09:30h - 13:30h</td>
<td>Rohde &amp; Schwarz Tutorial Seminars</td>
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<td>11:15h - 12:00h</td>
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<td>111-112-113 on Level 1</td>
<td>09:30h - 13:00h</td>
<td>National Instruments Workshops</td>
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<td>101 &amp; 102 on Level 1</td>
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<td>Anritsu Workshops</td>
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<td>09:30h - 11:00h</td>
<td>Rohde &amp; Schwarz Tutorial Seminars</td>
</tr>
<tr>
<td></td>
<td>Salle Passy on Level 1</td>
<td>11:00h - 14:45h</td>
<td>Rohde &amp; Schwarz Workshops</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15:45h - 16:45h</td>
<td>Rohde &amp; Schwarz Workshops</td>
</tr>
</tbody>
</table>

Color Legend:
- **Green** Anritsu Workshops
- **Red** Keysight Technologies Workshops
- **Blue** National Instruments Workshops
- **Blue** Rohde & Schwarz Workshops
Please note that registration is located on your right as you enter Level 1.

**THE EXHIBITION**

**LEVEL 1**  
**HALLS PASSY, NEUILLY, PARIS & TERNES**

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**KEY**
- Exhibitor Workshop
- Coffee Break
- MicroApps
- Poster Panels
- Registration Area
- Student Challenge
- Student Design Competition
- Registration Desks
- On site Registration
- Fast Track
- Storage
- Delegate Bags
- Server Room
- EuMA Desk

**ACCES / ACCESS**
- Ascenseur / Lift
- Monte-charge / Goods lift
- Toiletttes / Restrooms
- Escaliers / Stairs
- Escalator
- Parking
- Metro

---

**FLOOR PLAN**

**LEVEL 1**  
**HALLS PASSY, NEUILLY, PARIS & TERNES**

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**THE EXHIBITION**

**LEVEL 1**  
**HALLS PASSY, NEUILLY, PARIS & TERNES**

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THE CONFERENCE

LEVEL 2  CONFERENCE ROOMS

LEVEL 2
CONFERENCE ROOMS

AMPHITHEATRE BLEU
826 places

AMPHITHEATRE
de 1 813 à 3 723 places

HALL MAILLOT
5 540 m²
(excl. salle Maillot)

SALLE room MAILLOT
400 m²

Level 2

Level 1

Level 0

MAILLOT

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EXHIBITOR LIST

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ADVANTEN
Aerospace & Defense Technology
AFT Microwave GmbH
AIRMEMS
Albatross Projects GmbH
Altair Engineering GmbH
AMCAD Engineering
American Standard Circuits Inc.
Amplifier Solutions
Analog Devices
Anritsu
ANSYS France
API Technologies Corp.
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Aron
Arralis Ltd.
ART-F
ASB Inc.
Aspecomp Group Plc
Asystem France
AT Wall Company
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Chi-Shuai Enterprise Co., Ltd.
Chin Nan Precision Electronics Co. Ltd.
CISTEME
Cohium Microwave
Competitiveness Cluster Ekoys / CCI International Limousin
Compound Semiconductor
Copper Mountain Technologies
Cotsworks
CREE
CST-Computer Simulation Technology AG
Das Sheen Technology Co. Ltd.
DelMEMS
DeTi
Diamond Microwave
Diconex
Dow-Key Microwave
Ducommun
E&S Anechoic Chambers NV
e2v
Eclipse Microwave
EGIDE SA
Elbit Systems EW and SIGNT-Elisa
Electronic Specifier
Electronic Specifier Ltd.
Electronics World
Electromagnetic Components & Instrumentation
Elecrotronics
Elevo
ELHYTE
Equipeurs Scientifiques
ERZIA Technologies SL
EUROMIP
Everything RF
Excella Supply
Farran Technology Ltd.
FH Microwave SARL
Flann Microwave Ltd
Focus Microwaves Inc.
Fraunhofer FHR
Fraunhofer IAF
Freescale Semiconductors France SAS
Frontynk Technologies Inc.
Greenray Industries
Giga-concept
hf-Praxis
Hi-Ref Group
High Frequency Electronics
Holzworth Instrumentation
Huang Liang Technologies Co. Ltd.
Huber + Suhner AG
Hytem
IEMV-CNRS
IHP
Infineon Technologies AG
INGUIN Pruefmittelbau GmbH
INOVDCOS
Insulated Wire Inc
Intech Microwaves Srl
International Microwave Symposium (IMS)
Iosla GmbH
Izolink
JFW Industries
Johanson Technology
Jye Bao Co.
K&L Microwave
Keysight Technologies
Kuhne Electronic GmbH
L3 Communications Electron Devices
Laird
Lake Shore Cryotronics Inc.
Lansdale
LEW Technologies Ltd.
LHIF Laser & Electronics AG
MACOM
Marki Microwave
Matech Electronique
Maury Microwave Corp.
Mega Industries LLC
Megaphase
Mesures
Mician GmbH
Micro Systems Engineering GmbH
Microwave Engineering Europe
Microwave Innovation Group (MIG)
Microwave Journal
Microwave Product Digest (Octagon Comms)
Microwave Products Group
Microwavefilters & TVC Srl
Microwaves and RF
MITS Electronics
Mitsubishi Electric Europe BV
Molex Incorporated
MOSIS
MPI Corp.
MTI-Milliren Technologies Inc.
Nanoki Group
National Instruments
Noise XT
Norden Millimeter
NU slug EUROSTAR e.U.
Nuvaxes
NXP Semiconductors
OML
OMMIC
Pacific Millimeter Products
PasquaI Microwave Systems Srl
Pickering Interfaces Ltd.
PICO Technology Ltd.
PoleZero Corporation
Premix Oy
Presto Engineering Inc.
QP Microwave
Radar Systems Technology Inc.
Radiall
Res-Net Microwave Inc.
RFHIC Corp.
RF Microtech s.r.l.
RFMW Europe Ltd.
Rogers Corp.
Rohde & Schwarz
Rosenberger Hochfrequenztechnik GmbH & Co. KG
SAF Tehnika
San-iron
Saras Technology Ltd
Schmidt & Partner Engineering AG
SCHOTT AG
SIAE MICROELETTRONICA
Sonnet Software Inc.
Soontai Tech Co. Ltd.
Southwest Microwave Inc.
SpaceForest Sp. z o.o. (Ltd.)
Spectrum Electrotechnik GmbH
Sphera Test and Services
Spinnor GmbH
STACEM
Sumitomo Electric Device Innovations
Sumitomo Electric Europe Ltd.
Sumitomo Electric Industries
Synaero
Synopsis Corporation Group
Synopsis Technologies
Taconic
Tech-Inter
Technivive
Teledyne Coax Switches
Teledyne Defence Ltd.
Teledyne Labtech Ltd.
Teledyne Relays
Temwell Corp.
Times Microwave Systems
TNO Defense, Safety and Security
Trans-Tech/Skyworks
United Monolithic Semiconductors (UMS)
Varioprint AG
Vector Telecom
VA electronic GmbH
WILEY
WIN Semiconductors Corp.
Wireless Design & Development
Würth Elektronik eSos GmbH & Co. KG
XLIM Research Institute

The Exhibitor List is correct at the time of going to press. It is subject to change.

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