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Welcome to the 19th European Microwave Week

After an absence of 15 years, it is my great pleasure to welcome you back to London for the 19th European Microwave Week (EuMW) to be held at the ExCeL London Exhibition and Convention Centre from the 3rd to the 7th October. London is a leading global city and a world cultural capital. Culture in its true sense embraces all of art, science and engineering and London can lay claim to represent the story of modern science as Newton, Faraday, Maxwell, Franklin, Babbage and Fleming were all Fellows of the Royal Society and lived in London. Our motto for the conference week is ‘Microwaves Everywhere’ and this reflects the way microwave technology is fully integrated into our lifestyles, continuously 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 London to discover innovations and new paradigms for the microwave community as we look towards Horizon 2020.

Organised since 1998 by the European Microwave Association, EuMW is the premier microwave event in Europe, bringing together the microwave community from around the world. The week comprises the 46th European Microwave Conference (EuMC) to be held from 4th to 6th October, the 11th European Microwave Integrated Circuits Conference (EuMIC) to be held on 3rd and 4th October, and the 13th European Radar Conference (EuRAD) that will run from 5th to 7th October. Another key element of EuMW is the European Microwave Exhibition, the largest microwave and RF trade show in Europe with 300 international exhibitors (including Asia and USA as well as Europe).

This year there are 4 special and 3 focussed sessions drawing attention to interesting technical topics and links with other microwave communities. There are sessions updating advances in THz imaging and multipactor effects as well as the new, to the conference, topic of surface waves. The broad links and connections to this conference from around the world are represented by selected papers from the Asia Pacific Conference, the European EMC Conference, the UK RF and Microwave Measurement Society (ARMMS) and a special group of papers highlighting activities from countries in South, Central and North America.

Workshops and Short Courses will be held during the week and complement the three conferences by covering key themes: 5G communications; GaN, CMOS and SiGe technologies and their applications in the mm-wave and THz bands; additive manufacturing; power amplifiers; developments in space based technologies; and automotive, multistatic and space based radar.

Thanks to its resounding success since its inception in 2010, The Defence, Security and Space Forum continues to be a major event. It will take place on Wednesday 5th October and focus on defence and security in Complex Urban Environments. An informal cocktail reception will be provided for delegates and speakers after the sessions.

All three conferences feature an excellent programme of technical papers on the latest microwave techniques, but it is worthwhile highlighting some of the invited speakers and topics that will be presented during the opening and closing sessions of each conference. For the EuMC conference, Glyn Thomas, who is Payload Director of Airbus, will give a talk at the opening session entitled ‘Quantum Flexible Payloads for Telecoms Satellites’. The EuMC conference closing session features Mark Pierpoint, VP of Keysight Technologies, who will present a fascinating insight into the world of microwave instrumentation and Nick Ridler from NPL giving a talk on ‘Measurement Calibration at THz Frequency’.

The EuMIC conference opening features internationally-renowned Dylan Williams from NIST in the USA describing ‘THz Transistors and Calibration Challenges’ and Liam Devlin from Plextek presenting an industry perspective on ‘MMICs - Custom or COTS?’ The inimitable Steve Cripps of Cardiff University, with his entertaining and most likely provocative views on Power Amplifiers, will close EuMIC.

Several early career and student based events will occur in parallel with the main conference sessions. The Student Challenge is a poster competition where groups of students develop new ideas based on papers presented at the conference. The Student Design Competition is a design and measurement contest where the students present the performance of their prototypes in a special event held during the week. Prizes will be awarded to the students judged to have made the most significant contribution in both competitions. The Industrial Career Platform will be an opportunity for companies to meet students and young engineers looking for a career in the microwave and RF sector.

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There is also an Industry Focussed Panel Discussion on Wednesday 5th October on ‘Solid-State and Vacuum PAs: Latest Industrial Trends and Future Directions’.

The well-established Women in Engineering event, co-sponsored by the IEEE MTT-Society, will include a panel session focused on inspiring women in Engineering, and will end with a tour of one of London’s wonderful attractions.

EuMW 2016 will be promoting several social events including our Monday (3rd October) EuMIC get-together dinner at the Bridge Restaurant in ExCeL and on Tuesday evening the annual Welcome Reception sponsored by Keysight Technologies. In addition, on Wednesday 5th October, you will be invited to join us for an unforgettable Thames boat cruise to central London, including a cocktail reception on board, which will transport you through London as the sun sets on the most fascinating landmarks of the city centre. Don’t miss this unforgettable experience that can be shared with relatives, friends and colleagues!

I’m sure that you will enjoy a memorable experience in London at the EuMW 2016.

Andrew Gibson, General Chairman
Promoting European Microwaves

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

Join the EuMA Community
Welcome to London 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: Membership to EuMA is open to 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 the Middle East. If you are not a EuMA member yet, I encourage you to join. Among other benefits, you will enjoy reduced fees for attending the Week and other EuMA-sponsored conferences and workshops as well as the IEEE International Microwave Symposium. Moreover, you will have access to the internal part of our website, which provides an archive of publications, the on-line version of the International Journal on Microwave and Wireless Technologies and further networking opportunities.

The European Microwave Week (EuMW) is the premier microwave conference and exhibition in Europe. Its centrepiece is the European Microwave Conference (EuMC), the largest of the three 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 organised by our long-standing partner Horizon House Publications forms an integral part of it.

As everybody knows, 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 Andrew Gibson, 2016 General Chair, to Ian Robertson, General TPC Chair, to John Walker, Treasurer, to Ian Hunter and Steve Nightingale, EuMC Chair and TPC Chair, to Thomas Brazil and Alaa Abunjaileh, EuMIC Chair and TPC Chair, and to David Daniels and Laith Danoon, EuRAD Chair and TPC 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 London exciting and enjoyable. Thank you!

After holding EuMW twice in Manchester, we are back to London this year, to the ExCeL conference centre which has been completely refurbished and expanded and meets our needs now much better than before. London is a beautiful city, rich in tourist attractions and history, and for many of our overseas colleagues is a gateway to Europe. At the time of writing, it is not yet clear whether London will belong to the European Union any more when we hold the EuMW but I am sure this will not affect the city’s attractiveness.

In conclusion, I would like to cordially invite you to EuMW 2016. I hope you will not only learn about exciting ideas and gain new insights from presentations and posters but also find enough time to meet with colleagues and friends. Join us and see you in London!

Wolfgang Heinrich
President
European Microwave Association
Welcome to the 46th European Microwave Conference, EuMC 2016

It is our great honour to welcome you back to London after more than 15 years for the 46th European Microwave Conference (EuMC). The venue is the ExCeL Conference Centre. It is located right in the heart of one of the world’s most exciting and dynamic cities and provides outstanding facilities for both the conference and exhibition. With its prime location and easy access from all major transport links, London is the perfect venue to host the European Microwave Week (EuMW). The European Microwave Conference is Europe’s leading forum for presenting microwave and related technologies. This year we received a higher than anticipated number of submissions, with 630 papers being submitted. We would like to extend our special thanks to the 300 reviewers and 60 members of the EuMC TPC, without whom the programme of very high quality papers could not have been put together.

We are proud to present a wide range of activities including 49 EuMC and 12 joint Technical Sessions, 15 Workshops, 5 Short Courses, 3 Special Sessions, a Special Event, and the Student Challenge. One of the Special Sessions is devoted to the Asia Pacific Microwave Conference.

The technical sessions cover the latest microwave techniques including, filters, power amplifiers, antennas, biological applications and many other areas. The opening session includes a presentation by Glyn Thomas, Payload Director of Airbus entitled “Quantum Flexible Payloads for Telecoms Satellites”. Conference prizes will be presented at the closing ceremony along with fascinating insights into the worlds of microwave instrumentation and measurements by Mark Pierpoint of Keysight Technologies, and Nick Ridler of NPL.

We are indebted to Professor Andy Gibson, as General Chair of EuMW and Professor Ian Robertson as General Chair for the TPC, for their hard work and focused dedication, and also to everyone that has provided local support for this conference.

We believe that you will benefit considerably from the technical exchanges and social networking opportunities and that you will take full advantage of what this truly international conference has to offer to everyone that attends. We look forward to welcoming you there!

Ian Hunter
EuMC 2016 Chair

Shokrollah Karimian
EuMC 2016 Co-Chair

Steve Nightingale
EuMC 2016 TPC Chair
Welcome to the 11th European Microwave Integrated Circuits Conference, EuMIC 2016

It is a great pleasure for us to welcome you to London, UK for the 11th European Microwave Integrated Circuits (EuMIC) Conference that will be held on Monday the 3rd and Tuesday 4th October 2016. The EuMIC conference has been jointly organised by the GAAS® Association and EuMA since 2006. This premier European technical conference for RF & microwave microelectronics has proven to greatly contribute to the success of the overall European Microwave Week.

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.

In terms of materials, devices and characterisation, it is striking how strongly GaN-based devices have grown in recent years, and papers on these topics feature strongly in this year’s conference. Established GaAs technologies continue to be important, and the growth in RF CMOS and Si-based transceiver functions at mm-wave frequencies is also impressive. The increased interest in low-cost mm-wave circuits is likely to be driven by the technologies needed for the mass deployment of 5G within the next decade. There are also papers on more futuristic technologies at THz and using graphene as an RF material.

First-pass MMIC design is heavily dependent on accurate characterisation, modelling and CAD/CAE tools and papers on these topics feature strongly in the EuMIC conference. It is interesting that there is an entire session devoted solely to thermal and trapping effects in HEMTs, showing that these topics continue to be important, especially for GaN-based circuits.

At the higher levels of integration into complete systems, the interest in power amplifier devices and circuits continues to be very high, as well as in a range of topics such as millimetre and submillimetre-wave ICs, photonic ICs, mixed-signal and high speed digital ICs, tuneable and reconfigurable ICs as well as integrated receivers, transmitters and transceivers. Several high quality and topical workshops complement the EuMIC technical sessions and you are strongly encouraged to register for those of interest to you.

The EuMIC opening plenary session will feature 2 Keynote addresses by eminent speakers in their fields that nicely balance a futuristic research-oriented agenda with the more practical perspectives of industrial designers. Dylan Williams of NIST in the USA will speak on 'THz Transistors and Calibration Challenges’ while Liam Devlin from Plextek Ltd. in the UK will deliver a talk entitled ‘MMICs – Custom or COTS?’.

The closing session will include the traditional Foundry Session gathering several key representatives of RF and microwave semiconductor foundries, as well as a Keynote talk by a world-renowned expert on power amplifiers, Steve C. Cripps of Cardiff University, UK. Steve will give a talk on 'Balanced Microwaves', stressing the need for access to a mature and reliable multilayer integrated process for microwave designers.

During the closing ceremony, the award for the best contributed paper to EuMIC 2016 will be made by the EuMIC Technical Programme 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 announced and celebrated.

We look forward to welcoming you personally at the EuMIC conference, while wishing you an exciting and rewarding microwave week in London during October 2016.

Tom Brazil
EuMIC 2016 Chair

Stepan Lucyszyn
EuMIC 2016 Co-Chair

Alaa Abunjaileh
EuMIC 2016 TPC Chair
Welcome to the 13th European Radar Conference, EuRAD 2016

The EuRAD 2016 team has great pleasure in welcoming you to the 13th European Radar conference (EuRAD), to be held at the ExCeL Centre in London, from October 5th to October 7th. This conference is the major European event covering 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 modelling, advanced signal processing techniques, up to the most innovative radar architectures and concepts and the latest applications.

The opening session will take place on Wednesday 5th October at 09:00 – 10:40 when after a welcome address to the conference, Dr Paul Holbourn, Chief Technical Officer Selex ES, will present ‘Captor for Typhoon: Past Present and Future’. The Captor radar for Typhoon has been the most significant European airborne radar programme ever in terms of value and numbers and as the primary sensor within the Typhoon weapon system, much of the operational advantage that Typhoon enjoys derives from this radar.

This year, 171 papers were submitted to the conference, and after a rigorous selection process, the 100 accepted papers were organised into 13 oral sessions and 1 poster session. EuRAD delegates can also attend 5 sessions shared with EuMC, related to millimetre-wave antenna arrays and millimetre and THz Radar applications as well as antennas and propagation and electronic scanned array design.

Three focused short courses will be presented by renowned experts on very innovative and interesting fields, dealing with Electronic Scanned Array Design and Multibeam Antennas and Beamforming Networks.

We are fortunate to have a number of expert workshops covering a range of topics and led by renowned experts in the field as follows:-

- Automotive Radar chaired by Holger Meinel,
- Radar Imaging chaired by Professor Motoyuki Sato,
- Radar Performance in Clutter chaired by Professor Simon Watts,
- Bistatic and Multistatic Radar chaired by Professor Mike Cherniakov
- Digital Beamforming Space Borne Synthetic Aperture Radar chaired by Professor Steven Gao.

During the closing session, to be held on Friday at 14:20, after a complimentary lunch offered to all EuRAD participants, Professor Hugh Griffiths, will talk on ‘Early History of Bistatic Radar’. The paper and presentation will describe Appleton’s 1924 experiments to measure the height of the ionosphere (also the first FM radar), Watson Watt’s celebrated Daventry Experiment in 1935, and the German WW2 Klein Heidelberg system, which used the British Chain Home radars as its illumination source and which was the first proper operational bistatic radar.

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 2016.

We look forward to meeting you at the EuRAD 2016 conference, and wish you a very pleasant stay in London.

David Daniels  
EuRAD 2016 Chair

Albert Huizing  
EuRAD 2016 Co-Chair

Laith Danoon  
EuRAD 2016 TPC Chair

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Welcome from the General TPC Chair

I’m delighted that the European Microwave Week is back in London in 2016, it’s where I was born and it’s one of the most vibrant cities in the world. London has become a major global centre of the arts, entertainment, fashion, media, finance and commerce, education and tourism. I look forward to seeing you in London during the week and hope you enjoy the excellent conference programme and perhaps find time to visit some of the many sites of London.

As General Technical Programme Committee Chair, I would like to acknowledge the intensive work conducted by the reviewers and TPC members in just a few weeks between the paper submission deadline and the TPC meeting. The reviews were conducted by more than 450 reviewers and the 100-strong TPC met in London in March to rank the papers and organise accepted papers into a total of 92 sessions. EuMW maintains its high standard through the commitment of all these people, with individual papers typically receiving six independent reviewers’ scores and podium papers having an acceptance rate of around 50%. All of this is managed via the TPMS system and I would like to especially thank Matthias Rudolph, Marc van Heijningen, Jeff Pond and George Heiter, who have done tremendous work once again this year in setting up and managing the system and who efficiently contribute to the final programme preparation.

One of the benefits of being General TPC Chair is the opportunity to look at every single paper and see new technology trends across a wide range of disciplines. The three conferences see an increasing trend towards the applications of the millimetre-wave frequency range for communications and sensing. The European Microwave Conference (EuMC) remains the largest of the three conferences, focusing on core active circuits, passive components, antennas, measurement techniques and applications. The European Microwave Integrated Circuits Conference (EuMIC) sees ever-higher frequencies of operation and some remarkable achievements from silicon and silicon germanium technology. The European Radar Conference (EuRAD) has grown steadily and has cemented its place as a major European event. Of particular interest this year is the growing overlap between EuRAD and EuMIC, with miniature radar modules opening up new application sectors outside the traditional aerospace and defence sector.

Serving as General TPC Chair of EuMW 2016 has been a great honour and I look forward to seeing you in London in October.

Ian Robertson
2016 General TPC Chair

International Journal of Microwave and Wireless Technologies: EuMW 2016 Special Issue

The International Journal of Microwave and Wireless Technologies was created in 2009 by the European Microwave Association (EuMA) and Cambridge University Press for the benefit of the microwave research community in Europe and overseas.

The journal is published eight times a year. It allows academic and industrial researchers to promote their work and stay connected with the most recent developments in microwave and RF technology. The journal is referenced in databases such as Scopus and Google Scholar and is indexed in the Thomson Reuters Web of Science. Following the success of previous microwave weeks, the journal will again publish a special issue dedicated to European Microwave Week 2016.

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 Steve Nightingale, TPC chair of EuMC 2016, Alaa Abunjaileh, TPC chair of EuMIC 2016 and Laith Danoon, TPC chair of EuRAD 2016.

Accepted papers will be published online at http://journals.cambridge.org/MRF and can be referenced using their DOI (Digital Object Identifier). Once all submissions are received, the articles will be collated into the Special Issue and published in print, which is expected to appear in June 2017.

Roland Clarke
2016 Publications Chair

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EuMC Microwave Prize

DIDO Behavioral Model Extraction Setup Using Uncorrelated Envelope Signals

H. Zargar, A. Banai, J. C. Pedro
Sharif University of Technology, Tehran, Iran, and Aveiro University, Aveiro, Portugal

EuMC Young Engineer Prizes
(sponsored by Airbus Defence & Space)

Wideband Equivalent Circuit for Non-aligned 1-D Periodic Metal Strips Coupled Gratings.

C. Molero,
University of Sevilla, Sevilla, Spain

A 5.4W X-Band Gallium Nitride (GaN) Power Amplifier in an Encapsulated Organic Package.

S. Pavlidis
Georgia Institute of Technology, Atlanta, United States

EuRAD Young Engineer Prize
(sponsored by Airbus Defence & Space)

Passive UWB Beamforming: a N to M Compression Study.

T. Fromenteze
Xlim research institute - University of Limoges, Limoges, France

EuMIC Best Paper Prize

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

EuMIC NxP Prize 2015

An Inductorless Electrical-Balance 360° Phase Shifter for 0.5-1.15GHz in 0.18µm CMOS

B. van Liempd,
Imec, Leuven, Belgium

EuMIC Young Engineer Prize

A Novel W-band Bottom-LO-Configured Sub-harmonic Mixer IC in 130-nm SiGe BiCMOS.

X. Yang
Waseda University, Kitakyushu-shi, Japan
2016 EuMA Outstanding Career Award

Heinrich Daembkes is working with Airbus Defence and Space in the Electronics Engineering unit. His special interests are in the domains of high frequency systems, systems engineering of complex safety critical systems and networked automated systems.

After studying electrical engineering at the Technical University in Aachen, Germany, and a PhD degree from Duisburg University in 1984 on GaAs-based FETs and HEMTs he worked for many years in the R&D of high speed devices, circuits and subsystems in the Daimler group. In this period he performed with his research team on various III-V compound semiconductors (nM HBT-based optoelectronic receiver ICs, followed by GaAs and SiGe-based technologies and ICs). His group was known as one of the world-wide recognised centres for Semiconductor research regarding hetero materials. In parallel to the development of advanced millimetre-wave PHEMT MMIC technologies, he fostered the development of appropriately industrialised components for automotive radar applications. He holds about 20 patents, and is author / co-author of more than 150 articles, roadmaps and white papers. Further he is editor / co-editor of 4 books.

In 1995 he also became professor at the University of Ulm and in 1996 he became a co-founder and CEO of United Monolithic Semiconductors (UMS), a joint venture between Thales and EADS on GaAs-based MMICs, which is a successful commercial enterprise since then. This step was very important to maintain the position of Europe for high frequency devices and MMICs and to ensure the European non-dependence for these important material systems. Under his leadership the GaAs capabilities in Europe were further developed and even more important driven towards high standard industrialisation. He and his team have pushed the III-V compounds further to its physical limits and started the implementation of real volume production capabilities. The current situation of Europe having an independent GaAs (and GaN) volume manufacturer is mainly based on his enthusiasm and determination.

Since 2003 he has been with Airbus Defence and Space, where he was head of system and software engineering. His responsibility included development of complete systems in the domains of radar systems, electronic warfare (RF and optoelectronic) systems and avionics systems. Since 2013, he has been in his present advisor position. From 2008 to 2012 Heinrich Daembkes represented EADS/Airbus in the European Aeronautic, Space and Defence Organisation, where he served as chairman of the Security R&T committee.

Since its very beginning Prof. Daembkes is a member of the European Microwave Association EuMA, where he served for several years in the Board of Directors, also serving as industry liaison officer. He is also active in other microwave organisations including the IEEE and VDE/ITG. Since its foundation in 2006 he is representing Airbus Deutschland GmbH (ex EADS) as a member in ARTEMIS Industrial Association, where - from 2008 until 2012 - he was member of the Association Steering Board. Since January 2013 he is President of the Association and in this position also member of the ECSEL Governing Board - all with the same aim to strengthen the European microwave capabilities and to help Europe maintain its position in development and production of micro-/millimetre-wave components and systems.

2016 EuMA Distinguished Service Award

André Vander Vorst graduated in 1958 and received his Doctoral degree in 1965 from the UC Louvain (UCL), Belgium. As a research associate, he was at M.I.T. 1964-1965 where he received a M.Sc. degree, and at Stanford University 1965-1966, both in radioastronomy. In 1966, he founded the Microwave Laboratory at UCL, which he headed for 35 years. His research interests were successively loaded waveguides and cavities, atmospheric propagation up to 300 GHz, circuits up to 100 GHz, opto-microwaves, humanitarian demining, and bio-microwaves. He has been teaching in four Belgian universities on electromagnetics, transmission lines, and microwaves. He also taught analogue and hybrid computation, antennas, and microwave and satellite communications. He supervised more than 25 doctoral theses and about 200 engineer’s theses.

Prof. Vander Vorst has authored and co-authored seven books, a number of book chapters, and more than 300 papers in peer-reviewed journals and conference proceedings. His last book, RF/Microwave Interaction with Biological Tissues, with co-authors A. Rosen and Y. Kotsuka, was published in 2006.


Over the last 50 years Prof. Vander Vorst was actively involved in development of the international microwave community. In 1967-2001 he was chairing the Student Activities Committee and the Educational Activities Committee, and setting up the Chapter Coordination Committee in IEEE Region 8. He was a corresponding member of the Organizing Committee of the first EuMC in 1969 in London, Chair EuMC TPC in Brussels 1971, and Chair EuMC, Liège 1984. He has been a reviewer for every EuMC since 1969. He is a founder member of the European Microwave Association (EuMA) and has been EuMA secretary-treasurer for 18 years. In the latter function he has set up and developed EuMA Headquarters. He is now appointed Secretary Emeritus.

His service to the microwave community Prof. Vander Vorst includes working under the umbrella of IEEE MTT-S, in which he has been active in 1985-2006. He is a Life Fellow of the IEEE and obtained many awards, including the Microwave Career Award 2004 from IEEE MTT-S.

He is an associate member of the Belgian Royal Academy of Letters and Sciences, a member of the Academia Europaea and The Electromagnetics Academy, and an Honorary Member of the Belgian National Committee of URSI. He has been a member of the National Health Council in both Belgium and The Netherlands.

He loves music and has conducted choirs for more than 40 years.
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  - **Group 5** - Belgium, The Netherlands, Luxembourg
  - **Group 6** - Iceland, Norway, Sweden
  - **Group 7** - Denmark, Faroe Islands, Finland, Greenland
  - **Group 8** - Bulgaria, Czech Republic, Hungary, Romania, Slovakia
  - **Group 9** - Estonia, Latvia, Lithuania, Poland
  - **Group 10** - Armenia, Azerbaijan, Georgia, Moldova, Ukraine
  - **Group 11** - Albania, Bosnia and Herzegovina, Croatia, Cyprus, FYR Macedonia, Montenegro, Greece, Israel, Serbia, Slovenia, Turkey
  - **Group 12** - Belarus, Russia
  - **Group 13** - Austria, Liechtenstein, Switzerland
  - **Group 14** - Andorra, Portugal, Spain
  - **Group 15** - North America
  - **Group 16** - Asia-Pacific
  - **Group 17** - Africa and Middle East countries

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- **Appointed Members**
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  - Patrice Gamand
  - Luca Perregrini
  - Raymond Quéré
  - Richard Ranson
  - Almudena Suárez Rodríguez
  - Frank Van den Bogaart
  - Alexander Yarovoy

- **EuMW Officer**
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- **Secretary General**
  - Danielle Vanhoenacker - Janvier

- **GAAS Treasurer**
  - Massimo Comparini

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  - **2016:** Andrew Gibson
  - **2017:** Arne Jacob
  - **2018:** Magdalena Salazar - Palma
  - **2019:** Frank van Vliet

- **Conference Software Officers**
  - Matthias Rudolph
  - Marc van Heijningen
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Mohamed Elkhouly
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EuMW 2016 will be held in the dynamic and historically rich city of London. Bringing industry and academia together, European Microwave Week 2016 is a five day event, including three cutting edge conferences and one exciting trade and technology exhibition featuring leading players from across the globe. EuMW 2016 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 19th European Microwave Week combines:
• Three Major Conferences
• Associated Workshops
• Tailored Courses and Seminars for industrialists, academics and researchers
• Leading International Trade Show

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

BADGES
Online registrants will automatically be e-mailed their badge barcode and an order confirmation receipt immediately after they pay. All those who have pre-registered should bring their badge barcode and confirmation with them to the conference where they can print out their badge by scanning their barcode at the Fast Track desk onsite. Once you have collected your badge, 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 at the entrance to the exhibition hall 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

CONFERENCES
Choose from three separate but complementary conferences. Spanning the length of the week, starting from Monday 3rd October, the conferences and workshops are scheduled as follows:
• European Microwave Integrated Circuits Conference (EuMIC) 3rd – 4th October 2016
• European Microwave Conference (EuMC) 4th – 6th October 2016
• European Radar Conference (EuRAD) 5th – 7th October 2016
• Plus Workshops and Short Courses (3rd - 7th October 2016)
• In addition, EuMW 2016 will include the ‘Defence, Security and Space Forum’ on 5th October 2016

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

Online registration opens on 1st June 2016 and remains open up to and during the event until 7th October 2016. During the event, you can also register onsite from Sunday 2nd October 2016 (16:00 -19:00) and from 08:00 each morning from Monday 3rd October 2016 to Friday 7th October 2016.

The conferences will be held in different rooms over the conference dates. Please refer to the Conference Matrix at the back of this booklet for a detailed overview. Delegates 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 booklet. There are additional charges for attending workshops and short courses.

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 combining all three conferences. Slides for workshops and short courses will be provided on a separate USB stick for those who register for one or more workshops or short courses.

No hard copies of workshop slides will be provided, but electronic download will be available ahead of the conference.

POSTER SESSIONS
The poster panels are located in the conference area, on level 3 on Monday and at the Exhibition as signposted on Tuesday, Wednesday and Thursday.

SPEAKER PREPARATION SPACE
A speaker preparation space is located in the conference area.
EXHIBITION HOURS
The exhibition area will be located in Halls 20-23 as shown on the Floor Plans at the back of this booklet. As a registered delegate you will have full access to the exhibition area.

The exhibition opening hours are:
Tuesday 4th October: 9:30 - 18:00 (followed by the Welcome Reception)
Wednesday 5th October: 9:30 - 17:30
Thursday 6th October: 9:30 - 16:30
See the back cover for a full listing of the exhibitors (correct at the time of going to press).

EuMA MEMBERSHIP
One can apply for EuMA membership by ticking the appropriate box during registration for EuMW. In general, membership applications received after August 1, or through the EuMW registration form are intended for the next calendar year. However, the discount for the EuMW fees applies immediately. EuMA membership fee is £19 for Professionals and £11 for Students. EuMA offers a three-year free membership for people residing in NIS and some African countries.

EuMA membership provides access to the restricted part of the EuMA website, e.g., the Knowledge Centre which presently contains over 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. Furthermore, EuMA members are entitled to free electronic access to the ‘International Journal of Microwave and Wireless Technologies’, which is published annually with 8 issues. There is a special offer when subscribing to both Membership and printed Journal: £50 for Professionals, £43 for Students.

HOTELS AND TRAVEL
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 the booking page http://www.connexhotelsandevents.com/eumw-2016-london.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.

GETTING TO EXCEL LONDON
London can easily be reached by plane and is served by six international airports and a very convenient railway system. Details of how to reach ExCeL can be found at http://ExCeL.london/visitor/getting-here

By London Underground
The Jubilee Line and the DLR (The Docklands Light Railway) are the quickest routes to ExCeL London. Alight at Canning Town on the Jubilee Line and change onto a Beckton-bound DLR train for ExCeL: Prince Regent for ExCeL (for the east entrance or the ICC London.) Visit https://tfl.gov.uk for information on routes and timetables.

By Rail
Rail services in the UK are run by a set of private train operating companies. Your point of departure will determine the best service to take and at what station your train will arrive into London. London’s main rail stations are:
• Charing Cross (27 minutes from ExCeL)
• Euston (32 mins)
• King’s Cross/St Pancras International (32 mins)
• Liverpool Street (26 mins)
• London Bridge (16 mins)
• Marylebone (31 mins)
• Moorgate (26 mins)
• Paddington (32 mins)
• Victoria and Waterloo

Train tickets can be booked via:
https://www.thetrainline.com
http://www.nationalrail.co.uk
http://www.eurostar.com/uk-en

Typically, booking your tickets early will secure you the best possible fare.

By air
London has six international airports. If you are flying into the capital to attend an event at ExCeL, we recommend using London City Airport if you can as it is less than a mile from the venue. From London City Airport, it takes just 5 minutes by taxi or 15 minutes by DLR (Docklands Light Railway) to get to ExCeL. The airport has 350 flights per day, from over 40 international destinations including Amsterdam, Dublin, Madrid, Nice, Frankfurt, Rome and Zurich.

London City Airport
Average journey time by public transport: 15 mins
• Depart London City Airport, taking the DLR west towards Canning Town
• Change at Canning Town, heading east on the DLR towards Beckton
• Arrive Prince Regent for ExCeL (East)

Gatwick Airport
Average journey time by public transport: 1 hour
• Depart Gatwick train station, heading towards London Victoria on the Gatwick Express or Southern Trains. From Victoria, head east on the Circle (yellow) or District (green) line
• Change at Westminster, heading east on the Jubilee line (grey)
• Change at Canning Town, heading east on the DLR towards Beckton
• Arrive Prince Regent for ExCeL (East)

Heathrow Airport
Average journey time by public transport: 1 hour 30 mins.
• When using the Heathrow Express, you can pre-book tickets at a discounted price
• Depart Heathrow Airport on the Heathrow Express, heading to London Paddington
• From Paddington, head east on the Bakerloo line (brown)
• Change at Baker Street, heading south on the Jubilee Line (grey)
• Change at Canning Town, heading east on the DLR towards Beckton
• Arrive Prince Regent for ExCeL (East)
If you are using satellite navigation to cycle to the venue, we recommend using postcode - E16 1DR. For more information and to see a map of the route, please visit https://tfl.gov.uk/

In addition, ExCeL London has 60 cycle racks which are free to use. More at http://www.eumweek.com/conferences/How-to-Get-Here.html

OTHER USEFUL INFORMATION

CYBER CAFES AND WIFI

The cyber café, sponsored by CST, is located in the exhibition hall. WiFi is available in the conference area only on level 3.

CLOAKROOM

A cloakroom is located within the ExCeL Boulevard. Storage is charged at £1.00 per Item.

PERSONAL INVITATION

To verify whether you will need a visa invitation letter in order to attend EuMW 2016, please go to www.gov.uk. Contact Dr Christopher Duff, Lecturer at School of Electrical and Electronic Engineering, The University of Manchester, Manchester M13 9PL via Visa@manchester.ac.uk with your request for letters.

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 2016.

ELECTRICITY

Electricity is supplied at 240V, 50Hz. UK 3-pin plug.

SOCIAL EVENTS & PARTNER PROGRAMME

Full details of the social events & dinners that are taking place during EuMW 2016 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.

SHOPPING & SIGHTSEEING

London is the city that has everything. There are so many places to shop, tour, eat and be merry you will literally be spoilt for choice. ExCeL has put together a number of guides that will help you to plan your time away from European Microwave Week:

http://ExCeL.london/exhibitor/after-hours


For information on other top attractions, visit http://www.visitlondon.com
CONFERENCES 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

ONLINE registration is open from 1st June 2016 up to and during the event until 7th October 2016.

ONSITE registration is open from 16:00 on 2nd October 2016.

ADVANCE DISCOUNTED RATE (up to and including 3rd September) STANDARD RATE (from 4th September & Onsite)

CONFERENCE REGISTRATION FEES

There are two different rates available for the EuMW conferences

- ADVANCE DISCOUNTED RATE – for all registrations made online up to and including 3rd September (these are approximately 40% cheaper than the Standard Rate)
- STANDARD RATE – for all registrations made online from 4th September and onsite.

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

CONFERENCE REGISTRATION DETAILS

Online Registration

- All registrations should be made online at www.eumweek.com. Those completed up to and including 3rd September will be charged at the ‘Advance Discounted Rate’ and those from 4th September will be charged at the ‘Standard Rate’.
- Online registration is open from 1st June 2016 up to and during the event until 7th October 2016. You can also register onsite from 16:00 on Sunday 2nd October 2016 and then at the times detailed below.

Onsite Registration

Onsite registration is available:

- Sunday 2nd October 16:00 – 19:00
- Monday 3rd October 08:00 – 17:00
- Tuesday 4th October 08:00 – 18:00
- Wednesday 5th October 08:00 – 17:00
- Thursday 6th October 08:00 – 17:00
- Friday 7th October 08:00 – 10:00

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

HOW TO REGISTER

Online

- All registrations should be made online at www.eumweek.com.
- Delegates can register for one, two or all three of the conferences, workshops and short courses.
- Discounts will be given to those registering for two or more conferences.
- Payment can be made online using Amex, Visa, Mastercard or Bank Transfer.
- Registrants paying by Credit Card will be sent an automatic email confirmation, with a receipt and badge barcode.
- Registrants choosing to pay by Bank Transfer will receive their confirmation, but their receipt and badge barcode will be sent only once payment has been received and cleared by Horizon House.
- Please note that fees are not subject to VAT.

Onsite

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

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

BADGE COLLECTION AT FAST TRACK CHECK IN DESK

- All online registrants should bring a printed copy of their email confirmation 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 online 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 badge 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.
- On Tuesday, Wednesday & Thursday coffee breaks will take place within the exhibition area as sign posted.
- On Monday & Friday, they will take place on Level 3. 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 the Platinum Suite after show close at 18:30 on Tuesday 4th October. Badges will be scanned to allow entrance.

THE EuMW CRUISE ON THE RIVER THAMES - 5TH OCT 2016

Join us aboard M.V London Rose and MV Avontuur for a traditional two-hour Thames sightseeing cruise leaving Greenwich Pier at 19:00. The cruise will take you from Royal Greenwich into Central London before turning and heading back down river to Greenwich. During the cruise we will pass more than twenty of London’s iconic landmarks including Tower Bridge, the Tower of London, St. Paul’s Cathedral, The London Eye and the Palace of Westminster. Throughout the cruise one of our knowledgeable crew members will point out places of interest and give you some of London’s history as we pass by. This unique sightseeing experience will be complimented with a drinks reception and canapés. Don’t miss this unforgettable experience! Tickets are limited, so register today! The boat will then return to Greenwich pier for 21:00 to allow you to disembark.

EuMIC SOCIAL EVENT

After collecting their badges at the conference venue, EuMIC attendees wishing to attend the EuMIC Social Event on Monday evening should go to a separate counter to collect their ticket. These will be allocated on a first-come, first-served basis as there are a limited number of places.

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.

www.eumweek.com | 21
Reduced rates are offered if you have society membership to any of the following*: EuMA, GAAS, IET or IEEE. EuMA membership fees: Professional £19/year, Student £11/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 1st August 2016).

The fees shown below are invoiced in the name and on behalf of the European Microwave Association. EuMA’s supplies of attendance fees in respect of the European Microwave Week 2016 are exempted from UK VAT as specified in VAT 1994 Schedule 9 Group 6 Item 1 (a) Note 1 (e) ii).

**ADVANCE REGISTRATION CONFERENCE FEES (UP TO AND INCLUDING 3RD SEPT.)**

<table>
<thead>
<tr>
<th>CONFERENCE FEES</th>
<th>ADVANCE DISCOUNTED RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Society Member (*any of above)</td>
<td>Non Member</td>
</tr>
<tr>
<td>1 Conference</td>
<td></td>
</tr>
<tr>
<td>EuMC</td>
<td>£355</td>
</tr>
<tr>
<td>EuMIC</td>
<td>£270</td>
</tr>
<tr>
<td>EuRAD</td>
<td>£240</td>
</tr>
<tr>
<td>2 Conferences</td>
<td></td>
</tr>
<tr>
<td>EuMC + EuMIC</td>
<td>£500</td>
</tr>
<tr>
<td>EuMC + EuRAD</td>
<td>£480</td>
</tr>
<tr>
<td>EuMIC + EuRAD</td>
<td>£410</td>
</tr>
<tr>
<td>3 Conferences</td>
<td></td>
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<tr>
<td>EuMC + EuMIC + EuRAD</td>
<td>£610</td>
</tr>
</tbody>
</table>

**STANDARD REGISTRATION CONFERENCE FEES (FROM 4TH SEPT. AND ONSITE)**

<table>
<thead>
<tr>
<th>CONFERENCE FEES</th>
<th>STANDARD RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Society Member (*any of above)</td>
<td>Non Member</td>
</tr>
<tr>
<td>1 Conference</td>
<td></td>
</tr>
<tr>
<td>EuMC</td>
<td>£500</td>
</tr>
<tr>
<td>EuMIC</td>
<td>£380</td>
</tr>
<tr>
<td>EuRAD</td>
<td>£340</td>
</tr>
<tr>
<td>2 Conferences</td>
<td></td>
</tr>
<tr>
<td>EuMC + EuMIC</td>
<td>£710</td>
</tr>
<tr>
<td>EuMC + EuRAD</td>
<td>£680</td>
</tr>
<tr>
<td>EuMIC + EuRAD</td>
<td>£580</td>
</tr>
<tr>
<td>3 Conferences</td>
<td></td>
</tr>
<tr>
<td>EuMC + EuMIC + EuRAD</td>
<td>£860</td>
</tr>
</tbody>
</table>

**WORKSHOP AND SHORT COURSE FEES (ONE STANDARD RATE THROUGHOUT)**

<table>
<thead>
<tr>
<th>FEES</th>
<th>STANDARD RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Society Member (*any of above)</td>
<td>Non Member</td>
</tr>
<tr>
<td>Half day WITH Conference registration</td>
<td>£75</td>
</tr>
<tr>
<td>Half day WITHOUT Conference registration</td>
<td>£100</td>
</tr>
<tr>
<td>Full day WITH Conference registration</td>
<td>£105</td>
</tr>
<tr>
<td>Full day WITHOUT Conference registration</td>
<td>£135</td>
</tr>
</tbody>
</table>

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**The Defence, Security and Space Forum**

- **Date**: Wednesday 5th October
- **Time**: 11:20 - 19:00
- **Title**: Defence, Security & Space Forum
- **Location**: Rooms 8 to 11
- **No. of Days**: 1
- **Fee**: £10 for delegates (those registered for EuMC, EuMIC or EuRAD) / £40 for all others (those not registered for a conference)

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**THE EUMW CRUISE ON THE RIVER THAMES - 5th Oct 16**

Tickets for the cruise are limited and are available on a first-come -first-served basis at the price of £25.00 for EuMW Delegates and £36.00 for guests.

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**Proceedings on USB Stick**

All papers published for presentation at each conference will be on a USB stick, given out FREE with the delegate bags to those attending conferences. For additional USB sticks the cost is £50.

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**International Journal of Microwave and Wireless Technologies** (8 issues per year)

International Journal combined with EuMA membership: £50 for Professionals or £43 for Students.

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**Partner Programme and Social Events**

Full details and contacts for the Partner Programme and other Social Events are available via the EuMW website [www.eumweek.com](http://www.eumweek.com)
### EUROPEAN MICROWAVE WEEK WORKSHOPS AND SHORT COURSES

#### MONDAY 3rd October

<table>
<thead>
<tr>
<th>Time</th>
<th>Workshop Code</th>
<th>Organiser</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Day</td>
<td>WM01</td>
<td>EuMC</td>
<td>Full Day WM01 EuMC Reconfigurable RF &amp; Microwave Passive Components for Emerging Wireless Systems</td>
</tr>
<tr>
<td>Full Day</td>
<td>WM02</td>
<td>EuMC</td>
<td>Full Day WM02 EuMC Millimetre-Wave Electronics for High Capacity Wireless Networks</td>
</tr>
<tr>
<td>Full Day</td>
<td>WM03</td>
<td>EuMC</td>
<td>Full Day WM03 EuMC Additive Manufacturing for RF Passive Hardware</td>
</tr>
<tr>
<td>Full Day</td>
<td>WM04</td>
<td>EuMC</td>
<td>Full Day WM04 EuMC Wireless Power Transmission for Space Applications</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>WM05</td>
<td>EuMC</td>
<td>Half Day AM WM05 EuMC Microwave Passive and Active Devices with Integrated Filtering Functions</td>
</tr>
<tr>
<td>Full Day</td>
<td>WM06</td>
<td>EuMC</td>
<td>Full Day WM06 EuMC Current and Future Use of Spectrum by PMSE</td>
</tr>
<tr>
<td>Full Day</td>
<td>WM07</td>
<td>EuMC</td>
<td>Full Day WM07 EuMC New Developments for Satellite Communications on the Move</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>WM08</td>
<td>EuMC</td>
<td>Half Day PM WM08 EuMC Advances in Millimetre-Wave 3D Printing and MCM Technologies</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>SCM01</td>
<td>EuMC</td>
<td>Half Day PM SCM01 EuMC The Basics of Travelling Wave Tube Amplifiers</td>
</tr>
</tbody>
</table>

#### TUESDAY 4th October

<table>
<thead>
<tr>
<th>Time</th>
<th>Workshop Code</th>
<th>Organiser</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Day PM</td>
<td>WTu01</td>
<td>EuRAD</td>
<td>Half Day PM WTu01 EuRAD The Application of Automotive Radar - the Further Development Towards Safety Features</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>WTu02</td>
<td>EuRAD</td>
<td>Half Day PM WTu02 EuRAD Radar Imaging - VHF to THz</td>
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#### WEDNESDAY 5th October

<table>
<thead>
<tr>
<th>Time</th>
<th>Workshop Code</th>
<th>Organiser</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Day AM</td>
<td>WW01</td>
<td>EuMIC</td>
<td>Half Day AM WW01 EuMIC Highly-Integrated Millimetre-Wave Systems for Small-Cell Backhaul Communication Applications</td>
</tr>
<tr>
<td>Full Day</td>
<td>WW02</td>
<td>EuMIC</td>
<td>Full Day WW02 EuMIC Trends in CMOS RF ICs</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>WW03</td>
<td>EuMIC</td>
<td>Half Day PM WW03 EuMIC Towards 0.7 THz SiGe HBT Technology - the DOTSEVEN Project</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>WW04</td>
<td>EuMC/EuMIC</td>
<td>Half Day PM WW04 EuMC/EuMIC Power Amplifier Design Challenges and Solutions for Millimetre-Wave Radios</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>WW05</td>
<td>EuMC/EuMIC</td>
<td>Half Day PM WW05 EuMC/EuMIC Recent Advances in GaN Power HEMTs Related to Thermal Problems and Low-Cost Approaches</td>
</tr>
</tbody>
</table>

#### THURSDAY 6th October

<table>
<thead>
<tr>
<th>Time</th>
<th>Workshop Code</th>
<th>Organiser</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Day AM</td>
<td>WTh01</td>
<td>EuMC/EuMIC</td>
<td>Half Day AM WTh01 EuMC/EuMIC Waveform Engineering in Power Amplifier Design</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>SCTh01</td>
<td>EuMC/EuMIC</td>
<td>Half Day AM SCTh01 EuMC/EuMIC Fundamentals of Microwave PA Design</td>
</tr>
</tbody>
</table>

#### FRIDAY 7th October

<table>
<thead>
<tr>
<th>Time</th>
<th>Workshop Code</th>
<th>Organiser</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Day AM</td>
<td>WF01</td>
<td>EuMC</td>
<td>Half Day AM WF01 EuMC ArtiSc: Architecting Smart Internet-of-Things Networks for Smart Cities</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>WF02</td>
<td>EuRAD</td>
<td>Half Day AM WF02 EuRAD Radar Performance in Clutter - Modelling, Simulation and Target Detection Methods</td>
</tr>
<tr>
<td>Full Day</td>
<td>WF03</td>
<td>EuMC</td>
<td>Full Day WF03 EuMC Millimetre-Wave Technologies for 5G Mobile Networks and Short-Range Communications</td>
</tr>
<tr>
<td>Full Day</td>
<td>WF04</td>
<td>EuMC</td>
<td>Full Day WF04 EuMC Fundamentals and Engineering Considerations of THz Technologies: from Devices to Applications</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>WF05</td>
<td>EuMC</td>
<td>Half Day AM WF05 EuMC Advances in GaN Power Amplifiers: Linearity, Bandwidth and Efficiency</td>
</tr>
<tr>
<td>Full Day</td>
<td>WF06</td>
<td>EuMIC</td>
<td>Full Day WF06 EuMIC Chip Packaging and System-in-Package</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>WF07</td>
<td>EuMC</td>
<td>Half Day AM WF07 EuMC Compact and High Performance Millimetre-Wave and THz Sources &amp; Systems</td>
</tr>
<tr>
<td>Full Day</td>
<td>WF08</td>
<td>EuMC</td>
<td>Full Day WF08 EuMC Microwave and Millimetre-Wave Technologies for Medical Diagnostics and Imaging</td>
</tr>
<tr>
<td>Half Day AM</td>
<td>WF09</td>
<td>EuMC</td>
<td>Half Day AM WF09 EuMC Millimetre-Wave Transmission: Activities of the ETSI ISG MWT</td>
</tr>
<tr>
<td>Half Day PM</td>
<td>WF10</td>
<td>EuRAD</td>
<td>Half Day PM WF10 EuRAD Bistatic and Multistatic Radar</td>
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<td>Half Day AM SCF01 EuMC/EuRAD Electronic Scanned Array Design</td>
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<td>Half Day AM SCF02 EuMC/EuRAD Multibeam Antennas and Beamforming Networks</td>
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Continued interest in the subject and the ambition to develop and evolve the EuMW Defence, Security and Space Forum 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 2016 the emphasis will be on **Complex urban environments, encompassing the challenges and opportunities for indoor/enclosed and urban communications and sensing technologies**. The Forum has the scope to cover topics including: Smart City initiatives; 3D tracking technologies in complex and indoor environments; sensing complex targets in dense target environments; congested spectrum and network issues, including brown out issues in mm-wave sensing; integrated mm-wave sensing; universal RFID technologies etc.

The 2016 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**

**09:00 – 10:40 EuRAD Opening Session**

**11:20 – 13:00 Complex Urban Sensing and Communication**

Speakers from industry and academia will present RF solutions and systems that address the challenges imposed by operation in complex urban environments. This session will be presented by the key technical leaders in the various fields, providing a real world perspective into developing technologies and systems for urban sensing and communication. Confirmed speakers include:

- New Transceiver Technology Applied to Standoff Submillimetre-Wave Imaging Radar – Ken Cooper, JPL
- Indoor and Urban Environment Location of Moving People and Vehicles Using Signals of Opportunity – Pierfrancesco Lombardo, University of Rome
- Communication Satellite Impact on TV and Data Broadcasting Through Urban Environments – Erdem Demircioglu, Turksat International

**13:10 - 14:10 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.

**14:20 - 16:00 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 2016, the panel will address: Complex urban environments, encompassing the challenges and opportunities for indoor/enclosed and urban communications and sensing technologies.

**16:40 - 18:20 EuMW Defence & Security Executive Forum**

High level speakers from leading defence and security companies present their views and experiences on RF microwave technology trends and its use in urban environments. The presenters are complemented by speakers from government agencies and research organisations who will offer their perspective of military, security and industry needs, programmes, budgets and research into next generation systems. Confirmed presentations include:

- Challenges for Maritime Border Surveillance Radar - Tony Brown, EASAT
- Challenges in the ‘Future Borders’ Concept - Combining Technology, People and Processes - Roger Cumming, Fenley-Martel (ex UK Home Office)
- Challenges in Urban Sensing and Communications (Preliminary Title) - Ian Beresford, QinetiQ

**18:20 - 19:00 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 registered for a conference and £40 for those not registered for a conference. As information is formalised, the Conference Special Events section of the EuMW website will give further details and will be updated on a regular basis.
EuMW 2016 Student Challenge

Date: Tuesday 4th - Thursday 6th October 2016
Organiser: John Crute, The Technology Academy

The Student Challenge has become a fine tradition at European Microwave Week and is offered in 2016 for the ninth 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 behaviour. Skills future employers will highly value. For the EuMW 2016 Student Challenge, several teams shall be formed; each team is 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 poster. The poster must be based on at least two papers presented at EuMW 2016, 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 poster of each team according to the following criteria: Originality, content, feasibility and clarity. The winning team will receive the EuMW 2016 Student Challenge Prize worth €1,500. The sponsorship of this prize by Thales Nederland B.V. is greatly appreciated. All Bachelor, Master, and Doctoral students registered in any one of the EuMW 2016 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 john.crute@thetechnologyacademy.com and attach a copy of your student identity card or a confirmation, signed by your responsible professor. The deadline for registration is 31st August 2016.

Programme

Tuesday 4th October 2016
13:50 - 14:50 Kick-off meeting: Theme disclosure, instructions, team formation (Exhibition Hall)

Thursday 6th October 2016
10:00 Poster submission deadline (Exhibition Hall)
13:50 - 15:00 Poster presentation to jury and audience (Exhibition Hall)
16:40 - 18:20 Award ceremony during the EuMW/EuMC closing session (Rooms 8-11)

EuMW 2016 Student Design Competition

Date: Tuesday 4th October 2016
Organiser: Nutapong Somjit, University of Leeds, UK
Location: Exhibition (Left Side, Hall S23)

The European Microwave Week will be hosting, for the fourth 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 9 GHz Ultra-Low-Power Transmitter Design for 5G Communications. For this study, it is necessary to design a power amplifier, a band pass filter, a high gain antenna and other key RF devices for a transmitter. The realisation and fabrication of the ultra-low-power transmitter will be done prior to the event at the participants’ home institutes at their own costs. Only measurements will be conducted at the competition. The competition will take place during the conference week, in a special event on Tuesday 4th October 2016. 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 figures of merit, especially power consumption, of the whole transmitter and individual devices, will be recognised during the EuMW/EuMC closing session and will receive the EuMW 2016 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 2016 conferences are welcome to participate. The students must attend the conference to present their design for evaluation.

Design Competition
A 9 GHz Ultra-Low-Power Transmitter Design for 5G Communications. Complete information can be found at www.eumweek.com.

Registration
To register, please send an e-mail to Nutapong Somjit (N.Somjit@leeds.ac.uk), and attach a copy of your student identity card or a confirmation, signed by your responsible professor. The deadline for registration is 31st August 2016.

Programme

Tuesday 4th October 2016
11:00 - 13:00 Student Design Competition.
13:00 - 15:00 Presentation of the design by the students to the technical committee

Thursday 6th October 2016
16:40 - 18:20 Award ceremony during the EuMW/EuMC closing session
Special Panel Session on “Inspiring Women in Engineering”
- a Women in Microwave Engineering Event

Date: Tuesday 4th October 2016
Duration: 13:00 – 18:20
Location: Room 5
Visit: Greenwich Royal Observatory
Organisers: Noushin Karimian,
The University of Manchester, UK
Dominique Scheurs, KU Leuven, Belgium

We continue the tradition of holding the Women in Microwave Engineering event, sponsored by IEEE MTT-S during the European Microwave Week. Both women and men are welcome. This year’s event will take place in London, a leading global city and a world cultural capital. The event will focus on inspiring women in engineering and will end with a guided tour of the Greenwich Royal Observatory.

Programme

Tuesday 4th October 2016
13:00 - 14:30  Panel Session “Inspiring Women in Engineering”
14:30 - 18:00  Visit to Greenwich Royal Observatory
18:00  Return to ExCeL

Several invited speakers will give presentations on their current research and success as a woman in engineering. At the end of the panel session a visit to the Greenwich Royal Observatory will take place. To attend the event please pre-register by sending an email to Noushin.Karimian@Manchester.ac.uk, subject: EuMW 2016 - attend WiE event.

EuMW 2016 Career Platform

EuMW 2016 will continue the Career Platform initiative that began in 2013, with the aim of fostering the dynamic between young researchers, engineers and the job market in the RF and microwave field. Following its success in 2015, a dedicated area will again be provided for these young people to meet human resources and recruitment specialists. A special session will be held on industrial market analysis and career development. EuMW 2016 will also continue with the unique e-Platform initiative http://rf-and-microwave-jobs-in-europe.eu/, with the aim of offering the RF and Microwave community a job portal on a Europe-wide scale. The sponsorship of EuMW 2016 Career Platform by United Monolithic Semiconductors is greatly appreciated.

For further information, contact the Career Platform Chair:
Dr. Noushin Karimian
The University of Manchester
Email: Noushin.Karimian@Manchester.ac.uk
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 4th October 2016
Time: 9:00 - 10:40
Room 5
Registration: Free

This space will encourage networking between job seekers and recruiters. The platform lounge includes recruitment booths from European companies. Although focused on SMEs, large companies and academics are also welcome to take part.

Bring and share your CV, or join us as a recruiter!

E-Career Platform:
Date: Online
Time: 9:00 - 17:00
Registration: Free

This EUMW 2016 e-career platform initiative aims to support and promote the RF and Microwave community by providing a job portal on a Europe-wide scale:

http://rf-and-microwave-jobs-in-europe.eu/

Also please connect with us via our LinkedIn group, “RF and Microwave Jobs in Europe”.

United Monolithic Semiconductors
SOCIAL EVENTS

EuMIC Get-Together
Date: Monday 3rd October 2016
Duration: 18:30 until 20:00
Cost: Free to EuMIC delegates -
After collecting their badges at the conference venue, EuMIC attendees wishing to attend the EuMIC Social Event on Monday evening should go to a separate counter to collect their ticket registration. Tickets will be allocated on a first-come, first-served basis as there are a limited number of places.
Location: Near ExCeL Centre (details will be provided during the conference).

All registered EuMIC 2016 delegates are invited to a relaxed social get-together with friends and colleagues. Unwind after the first day of the conference, talk to the speakers and other experts, and enjoy some complimentary food and drinks. Delegates will need to bring their badge and ticket with them to gain admission.

Welcome Reception
Date: Tuesday 4th October 2016
Duration: 18:30 until 21:30
Cost: Free to conference delegates & invited exhibitors
Location: The Platinum Suite (level 1)

All registered conference delegates, as well as invited representatives from companies participating in the exhibition are invited to the EuMW 2016 Welcome Reception, sponsored by Keysight Technologies, Horizon House Publications and EuMA. Delegates will need to bring their badge and exhibitors their invite along with them to gain entrance.

The evening will begin with drinks at 18:30 followed by the General Chairs’ handover from EuMW 2016, London to EuMW 2017, Nuremberg as well as an address from the Platinum Sponsor, Keysight Technologies. The open-buffet dinner will be served from 19:00.

THE EuMW Cruise on the River Thames
Date: Wednesday 5th October 2016
Duration: 19:00 until 21:00
Cost: £25.00 for EuMW Delegates and £36.00 for guests
Location: Greenwich Pier

Please note that places are limited and assigned on a first-come-first-served basis.

Join us aboard M.V London Rose and MV Avontuur for a traditional two hour Thames sightseeing cruise leaving Greenwich Pier at 19:00. The cruise will take you from Royal Greenwich into Central London before turning and heading back down river to Greenwich. During the cruise we will pass more than twenty of London’s iconic landmarks including Tower Bridge, the Tower of London, St. Paul’s Cathedral, The London Eye and the Palace of Westminster. Throughout the cruise one of our knowledgeable crew members will point out places of interest and give you some of London’s history as we pass by. This unique sightseeing experience will be complimented with a drinks reception and canapés. Don’t miss this unforgettable experience! Tickets are limited, so register today! The boat will then return to Greenwich pier for 21:00 to allow you to disembark.
London is the cultural, political and economic heart of Britain, famous for world-class museums, galleries, royal palaces, shopping destinations, West End theatre shows and award-winning restaurants. With so much to do, it’s hard to narrow down the long list of reasons to visit, but below you’ll find our favourites.

If you would like to buy tickets for any of the attractions or tours, please contact Sally Garland on sally@connexhotelsandevevents.com.

The Spirit of London - Full Day Tour with Free Lunch Pack

Enjoy a whistle stop tour of London’s famous monuments and marvel at the history of London’s modern masterpieces from the comfort of your seat. Have your cameras ready for our drive past the spectacular Westminster Abbey. St. Paul’s Cathedral - Towering high over the City of London, magnificent St Paul’s Cathedral is widely considered to be Sir Christopher Wren’s masterpiece. Buckingham Palace and Changing of the Guard - A mass of red tunics, bearskins and Buckingham Palace - an unforgettable experience! Tower of London and Crown Jewels - During its 1000-year history this impressive fortress has been a Royal Palace, prison, mint and even a zoo! Be dazzled by the Cullinan diamonds and the spectacular Kohi-i-Noor at the Crown Jewels. River Thames Boat Ride - Setting off from the Tower of London, take to the water on a River Thames boat ride and enjoy a tour of the London sights as you head towards the beautiful Greenwich. Walking Tour of Greenwich - Explore the quaint beauty of Greenwich on this professionally guided walking tour, covering the iconic tea clipper Cutty Sark and the Old Royal Naval College, designed by Christopher Wren. After the walking tour, get back on board the River Boat and take in more of the city sights as you sail towards Central London. Choose to alight at either The London Eye or The Shard, both icons of London and very centrally located. This tour will finish at approximately 5:30pm, when you get off the boat.

The Spirit of London – Full Day Tour with Free Lunch Pack
Adult £90.00  Child £80.00

London Eye

At 135 metres, the London Eye is the world’s tallest cantilevered observation wheel; a feat of design and engineering, it has become the modern symbol representing the capital and a global icon. The experience showcases breath-taking 360-degree views of the capital and its famous landmarks and has been the number one visitor experience in the city for the past decade.

Adult ticket from £22.50 - Child ticket from £15.75.
HM Tower of London
Despite the Tower of London’s grim reputation as a place of torture and death, within these walls you will also discover the history of a royal palace, an armourey and a powerful fortress. Don’t miss Royal Beasts and learn about the wild and wonderous animals that have inhabited the Tower, making it the first London Zoo. Discover the priceless Crown Jewels newly displayed in 2012, join an iconic Beefeater on a tour and hear their bloody tales, stand where famous heads have rolled, learn the legend of the Tower’s ravens, storm the battlements and get to grips with swords and armour and much more!

Adult ticket from £22.50 - Child ticket from £10.50.

Harry Potter
Warner Bros. Studio Tour London provides an amazing opportunity to explore the magic of the Harry Potter™ films. This unique walking tour takes you behind-the-scenes and showcases a huge array of beautiful sets, costumes and props. It also reveals some closely guarded secrets, including facts about the special effects and animatronics that made these films so hugely popular all over the world.

Adult ticket from £66.00 – Child ticket from £61.00
Return transportation on a double decker branded bus
Duration: Approx. 7 hours (with transportation).

The View from The Shard
The View from The Shard is the premium visitor attraction at the top of Western Europe’s tallest building, and London’s newest landmark, The Shard.

Designed by Master Architect Renzo Piano, the Shard redifnes London’s skyline and has become a dynamic symbol of London. At a height of up to 800ft or 244m, The View from The Shard offers spectacular views over London for up to 40 miles. Twice as high as any other vantage point in the city, it is the only place where visitors can see the entire city at once.

Adult ticket from £30.95 - Child ticket from £24.95.

Free London Attractions
From London’s exquisite parks, to world-class museums such as the Natural History Museum, historic houses and stunning art galleries, there are some amazing free experiences to be had in London.

Changing the Guard at Buckingham Palace
For a display of British pomp and ceremony, watch the Changing the Guard ceremony outside Buckingham Palace. Changing the Guard or Guard Mounting involves the exchange of guard duties at Buckingham Palace. Watch the ceremony at set Opening hours:
11.30am daily at Buckingham Palace. 11.00am daily at Horse Guards Parade.

The British Museum
Founded in 1753, the British Museum’s remarkable collection spans over two million years of human history. Enjoy a unique comparison of the treasures of world cultures under one roof, centred around the magnificent Great Court. World-famous objects such as the Rosetta Stone, Parthenon sculptures, and Egyptian mummies are visited by up to six million visitors per year. In addition to the vast permanent collection.

Natural History Museum
Hundreds of exciting, interactive exhibits in one of London’s most beautiful landmark buildings. Highlights include the popular Dinosaurs gallery, Mammals display with the unforgettable model blue whale and the spectacular Central Hall, home to the Museum’s iconic Diplodocus skeleton. Don’t miss the state-of-the-art Darwin Centre Cocoon where, on a self-guided tour, you can see hundreds of fascinating specimens and look into laboratories where scientists are at work.

The Wallace Collection
A free national museum displaying superb works of art in an historic London town house. The collection was acquired principally in the 19th century by the 3rd and 4th Marquesses of Hertford and Sir Richard Wallace, the illegitimate son of the 4th Marquess. The 28 rooms, many recently refurbished with elaborate gilding & wall silks, present collections of French 18th-century painting, furniture and porcelain (many once owned by Madame de Pompadour and Queen Marie-Antoinette) together with paintings by Titian, Canaletto, Rembrandt and Gainsborough, Hals’ 'The Laughing Cavalier' and Fragonard’s ‘The Swing’, four armouries and wonderful Renaissance treasures.

The National Gallery
The National Gallery displays more than 2,000 Western European paintings from the Middle Ages to the 20th century. You can explore inspiring art by Botticelli, Leonardo da Vinci, Rembrandt, Gainsborough, Turner, Renoir and Van Gogh. The pictures in the collection belong to the public and admission to see them is free.

There are many more places to visit in London for more ideas go to the Visit London Website: www.visitlondon.com
### MONDAY

#### EuMIC01
**Si-based Transceiver Building Blocks**  
Chair: Norihau Suematsu, Tohoku University  
Co-Chair: Andrea Suriani, Thales Alenia

#### EuMIC02
**High Efficiency and Linear Power Amplifiers**  
Chair: Franco Giannini, University of Rome Tor Vergata  
Co-Chair: Frank van Vliet, TNO

#### EuMIC03
**Novel Characterisation Techniques for Microwave Devices**  
Chair: Carlos Camacho-Penalosa, Universidad de Malaga  
Co-Chair: Raymond Quérit, University of Limoges

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<td>Reconfigurable 4 Channel Carrier Aggregation Receiver using Harmonic Recombination Technique</td>
<td>S. Lee, D. Jeong, H. Jin, B. Kim</td>
<td>Pohang University of Science and Technology, Pohang, Republic of Korea</td>
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<td>EuMIC01-03</td>
<td>A 25 to 45 GHz SiGe Receiver MMIC</td>
<td>L. E. Miller, J. T. Harvey, M. E. Parker, L. T. Hall, M. C. Rodrigues, M. C. Heinrich, S. J. Mahon</td>
<td>Defence Science and Technology Group, Edinburgh, Australia, Macquarie University, Macquarie University, Australia</td>
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<td>EuMIC01-04</td>
<td>A Wideband Low Noise SiGe Medium Power Amplifier for X-Band Phased Array Applications</td>
<td>C. Caliskan, I. Kalyoncu, E. Ozeren, M. Kaynak, Y. Gurbuz</td>
<td>Sabanci University, Istanbul, Turkey, IHP Microelectronics, Frankfurt (Oder), Germany</td>
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<td>EuMIC01-05</td>
<td>Quasi-Circulator Based Automotive Monostatic Transceiver with Integrated Leakage Canceler</td>
<td>M. Porranzl, C. Wagner, H. Jaeger, A. Stelzer, Johannes Kepler Universität Linz</td>
<td>Linz, Austria, Danube Integrated Circuit Engineering, Linz, Austria</td>
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<td>EuMIC02-01</td>
<td>Wideband 3 Way Doherty RFIC with 12 dB Back-Off Power Range</td>
<td>J. Bledsoy</td>
<td>NXP, Toulouse, France</td>
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<td>EuMIC02-02</td>
<td>An Efficient W-Band InP DHBT Digital Power Amplifier</td>
<td>A. Wentzel, M. Hossain, D. Stoppel, N. Weimann, V. Krozer, W. Heinrich, Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfrequenztechnik, Berlin, Germany</td>
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<td>EuMIC02-03</td>
<td>20 W S-band High Power Amplifier using Stacked FET Technology</td>
<td>G. B. van der Bent, P. de Hek, F. E. van Vliet, G. Bosi</td>
<td>TNO, Den Haag, Netherlands</td>
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<td>EuMIC02-04</td>
<td>Predistortion- and Development-Platform for Multi-Input RF Power Amplifiers</td>
<td>P. Singerl, T. Magesacher, M. Mataln</td>
<td>Infineon Technologies Austria AG, Villach, Austria, Macquarie University, Lund, Sweden</td>
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<td>EuMIC02-05</td>
<td>Solid-State RF Power Amplifiers for ISM CW Applications Based on 100 V GaN Technology</td>
<td>G. Formicone, J. Burger, J. Custer, G. Bosi, A. Raffy, G. Vannini, Integra Technologies, Inc., El Segundo, United States, University of Ferrara, Ferrara, Italy</td>
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<td>EuMIC03-02</td>
<td>Short Pulse Thermal Response of HBTs</td>
<td>K. Yazawa, D. Kendig, A. Xiong, C. Charbonnaud, T. Gasseling</td>
<td>Microsani LLC., Santa Clara, United States, AMCAD Engineering, Limoges, France, Purdue University, West Lafayette, United States</td>
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<td>EuMIC03-03</td>
<td>Characterization and Modeling of Frequency Dispersion in RF LDMOS Transistors</td>
<td>P. H. Aaen, L. Zhang, K. Kim</td>
<td>University of Surrey, Guildford, United Kingdom, NXP, Chandler, United States</td>
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<td>EuMIC03-04</td>
<td>Characterization of a High Power GaN Device for Class E PA Design with Non-Sinusoidal Stimulus</td>
<td>V. Camarchia, E. Cipriani, P. Colantoni, M. Pradal, R. Quaglia, L. Cabria, N. Ayllon</td>
<td>Politecnico di Torino, Turin, Italy, University of Rome Tor Vergata, Rome, Italy, Cardiff University, Cardiff, United Kingdom, ESA-ESTEC, Keplerlaan, Netherlands</td>
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EuMIC Opening Session
Chair: Tom Brazil, EuMIC 2016 Chair
Co-Chair: Stepan Lucyszyn, EuMIC 2016 Co-Chair

11.20 – 11.40
Welcome Address
Opening of the European Microwave Integrated Circuits Conference 2016
Tom Brazil, EuMIC 2016 Chair

11.40 – 12.20
THz Transistors and On-Wafer Calibrations
Dylan Williams, National Institute of Standards and Technology, Boulder, CO, USA

Advances in microwave wafer probes and vector network analyzers have opened up a whole new world of discovery in microwave metrology, making possible accurate on-wafer measurements in printed transmission lines at microwave, millimetre-wave, sub-millimetre-wave, and even terahertz frequencies. Dr. Dylan Williams, winner of the 2013 IEEE Joseph F. Keithley Award in Instrumentation and Measurement and President Elect of the IEEE Microwave Theory and Techniques Society, will trace the history of on-wafer measurements, discuss the fundamental principles behind accurate on-wafer measurements, touch on important applications in transistor, device, and waveform measurement, and preview the bright future of a field that continues to grow in importance in electrical engineering.

12.20 – 13.00
MMICs – Custom or COTS?
Liam Devlin, Plextek RFI, Essex, UK

In recent years the availability of Commercial Off-The-Shelf (COTS) MMICs has increased significantly. Standard RF and microwave components addressing a wide range of functional blocks are now readily available, so it may seem unnecessary to consider developing custom MMICs. There are, however, occasions when a custom MMIC can be the best commercial option with the potential to offer cost savings, performance improvement, reduced component count, size reduction or even the means of implementing otherwise impractical functionality.

The speaker has many years of experience in developing both standard product and custom MMICs, and will draw on this to explain how to determine when a custom MMIC could be the best solution, illustrated with specific examples. He will then move on to describe the practicalities of using a commercial foundry to fabricate custom-designed MMICs, with guidelines on estimating unit cost and choosing the most appropriate foundry and process.
EuMIC Poster01 Session

Chair: Alaa Abujaileh, Airbus Defence and Space

13:00 – 14:20

The posters are on display from 13:00 – 14:20

The authors are present for discussion from 13:00 – 14:20

MONDAY

EuMIC Poster01-01
Integrated Microfluidic Channel with Wire-Bonded Structure
Solennite for Tunable Inductor Application
F. Bandhu-Fath, A. Al-D, Y. Wang1, T. Eghbald, N. Moh Noh, M. Mustafa1, 1Universiti Sains Malaysia (USM), Penang, Malaysia, 2Universiti Sains Malaysia (USM), Nilbong Tebal, Malaysia

EuMIC Poster01-02
Multi-Objective Optimization of Microwave Couplers using Corrected Domain Patching
S. Koziell1, A. Bekasiewicz2, 1Rykjavik University, Reykjavik, Iceland, 2Gdansk University of Technology, Gdansk, Poland

EuMIC Poster01-03
Effects of Buffer Leakage Current on Breakdown Characteristics in AlGaN/GaN HEMTs with a High-k Passivation Layer
Y. Satoh, H. Hasawa, Noto, Shibaura Institute of Technology, Saitama, Japan

EuMIC Poster01-04
Nonlinear GaAs pHEMT Model with Trapping Effect for Small-Signal and Dynamic Large-Signal Design
A. Olomo, Infineon, Linz, Austria

EuMIC Poster01-05
A Surface Potential Large Signal Model for AlGaN/GaN HEMTs
Q. Wu, Y. Xu, C. Wang, Z. Wen, R. Xu, University of Electronic Science and Technology of China, Chengdu, China

EuMIC Poster01-06
Characterization and Modelling of 40 nm mHEMT Process up to 110 GHz
R. Clerici, W. Cicognani, S. Colangeli1, E. Limiti1, P. Feijler, 1Università degli Studi di Roma Tor Vergata, Roma, Italy, 2Omic, Cedex Limel-Bvannes, France

EuMIC Poster01-07
Load Pull Circles Analysis Method for Applying the Outphasing Technique in Power Amplifier Design
Y. Jato-Llano1, A. Herrera-Guardado1, F. C. Huin1, 1University of Cantabria, Santander, Spain, 2ACCD Semiconductors Inc., Louveciennes, France

EuMIC Poster01-08
Common-Denominator Modelling for Stability Analysis of Electronic Circuits
A. Cooman1, F. Ferranti1, Y. Robain1, G. Vandersteen11, E. Loumaoud1, 1Vrije Universiteit Brussel, Brussels, Belgium, 2University of Antwerp, Hoboken, Belgium

EuMIC Poster01-09
Accurate FEM-based nMOS Switch Modelling Technique for RF Applications
F. Gacin1, P. Descamps1, N. Jordan1, 1NXP Semiconductors / LAMIPS, Caen, France, 2LAMIPS, Commun Laboratory NXP-CRISMAT, Caen, France, 3NXP Semiconductors, Caen, France

EuMIC Poster01-10
A New Current Dependent Gate Charge Model for GaN HFE Devices
J. G. Leckey, MACOM Technology Solutions, Belfast, United Kingdom

EuMIC Poster01-11
Controlling the Characteristics of Nanomechanical Resonators
A. Y. Nimets1, 1Technical University Hamburg-Harburg, Hamburg, Germany, 2Institute of Radio Astronomy of NASU, Kharkov, Ukraine

EuMIC Poster01-12
A Low-Cost 180 nm BiCMOS Technology with Horizontal Current Bipolar Transistor (HCBT) for Wireless Communication ICs
J. Ziaiek1, M. Korkcić2, H. Mochizuki, S. Morita1, T. Suligoi1, 1University of Zagreb, Faculty of Electrical Engineering and Computing, Zagreb, Croatia, 2Asahi Kasei Microdevices Co., Nobeoka, Japan

EuMIC Poster01-13
A K-Band High-Gain Down-Converter Mixer using Cross Couple Pair Active Load
Y. Chang, H. Wu, H. Lu, National Taiwan University, Taipei, Taiwan

EuMIC Poster01-14
A 6–46 GHz, High Output Power Distributed Frequency Doubler using Stacked FETS in 0.25um GaAs HEMT
T. Nguyen1, A. Pham1, K. Fujii2, 1University of California, Davis, Davis, United States, 2NXP Semiconductors, Caen, France

EuMIC Poster01-15
Results from a Prototype 66Gsp Digital-to-Analogue Converter with Greater than 7 GHz Analogue Bandwidth
A. Glascott-Jones, M. Stackler, N. Chantier, R. Pilard, 1e2v, St Egreve, France

EuMIC Poster01-16
0.61 THz Radiating Source with On-Chip Antenna on 65nm CMOS
B. Khamaisi, S. Jameson, E. Socher, Tel-Aviv University, Tel-Aviv, Israel

EuMIC Poster01-17
A 154–165 GHz LNA and Receiver in CMOS 65 nm Technology
J. Elkind, E. Socher, Tel-Aviv University, Tel-Aviv, Israel

EuMIC Poster01-18
A 49 to 64 GHz Frequency Doubler using Active CS-Based Gm-Boosted Technique in 90 nm CMOS Process
G. Chen, H. Chang, Y. Liu, Y. Hsin, National Central University, Jhongli, Taiwan

EuMIC Poster01-19
Miniature Fully-Integrated 2.5 and 3.5 GHz LDMOS Power Amplifiers in 40-nm CMOS Technology
M. Wu, T. Chang, J. Cheng, J. Tsai, T. Huang, National Taiwan Normal University, Taipei, Taiwan

EuMIC Poster01-20
NARMA Based Novel Closed Loop Digital Predistortion using Penrose-Moore Inverse Technique
M. Deepak Nair, R. Gjofe, P. Colantonio, F. Giannini, University of Roma Tor Vergata, Roma, Italy

EuMIC Poster01-21
A 21 dBm 60 GHz SiGe Power Amplifier using Modified Wilkinson Combiner
R. Ben Yishay, D. Elad, IBM Haifa Research Lab, Haifa, Israel

EuMIC Poster01-22
High Linearity Fully Integrated Class-O Power Amplifier in Standard 65 nm CMOS Technology
M. Wei, R. Negra, RWTH Aachen University, Aachen, Germany
**MONDAY**

**Room 7**

**EuMIC05**

**GaN Devices**
Chair: Frank E. van Vliet, TNO
Co-Chair: Didier Floriot, UMS

**EuMIC05-01**

**Quest for Vacuum Tubes’ Replacement: 150V UHF GaN Radar Transistors**
G. Formicone, J. Burgess, J. Custer, J. Walker, Integra Technologies, Inc., El Segundo, United States

**EuMIC05-02**

**Enhancement-Mode AlGaN/GaN FinFETs with High On/Off Performance in 100 nm Gate Length**
E. Turek, P. Brückner, M. Alsharef, R. Granzer, F. Schwierz, R. Quay, O. Ambacher, Fraunhofer Institute for Applied Solid State Physics (IAF), Freiburg, Germany, Ilmenau University of Technology, Ilmenau, Germany

**EuMIC05-03**

**Normally-Off AlGaN/GaN Recessed MOS-HEMTs on Normally-on Epitaxial Structures for Microwave Power Applications**
L. Trinh Xuan, R. Aubry, N. Michel, O. Patard, J. Jacques, S. Piotrowicz, M. Oualli, P. Gamarra, C. Peter, D. Lancereau, S. L. Delage, S. Laurent, P. Boyse, R. Quaire, III- V Lab, Palaiseau, France, University of Limoges, Limoges, France

**EuMIC05-04**

**InAl(Ga)N/GaN/SiC Devices Delivering 5W/mm Output Power at 30 GHz**

**Room 8**

**EuMIC06**

**Millimetre-Wave Low Noise Amplifiers**
Chair: Manfred Berroth, Universität Stuttgart
Co-Chair: Didier Belot, CEA-LETI

**EuMIC06-01**

**A Low Power High Gain Bandwidth E-Band LNA**
K. Hadjipour Ablantra, A. Stelzer, DICE GmbH & Co KG, Linz, Austria, Johannes Kepler University, Linz, Austria

**EuMIC06-02**

**150 GHz GaAs Amplifiers in Commercially Available 0.1-um GaAs PHEMT Process**
A. Bessemoulin, M. C. Rodriguez, S. J. Mahon, A. E. Parker, M. C. Heimlich, MACOM, Sydney, Australia, Macquarie University, Sydney, Australia

**EuMIC06-04**

**Cryogenic Low Noise MMIC Amplifiers for U-Band (40-60 GHz)**
L. Samouil: A. Fung, R. Kangalath, R. Gavronski, M. Sorel, C. Lawrence, G. Guer, M. Varaneni, D. Cuadrado-Calé, D. George, G. Fuller, R. La, S. Salkicy, K. Chey, Jet Propulsion Laboratory, Pasadena, United States, Aalto University, Aal, Finland, University of Manchester, Manchester, United Kingdom, Northrop Grumman Corporation, Redondo Beach, United States, California Institute of Technology, Pasadena, United States
## MONDAY

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**Millimetre-Wave and THz Transceiver Components**  
Chair: Huei Wang, National Taiwan University  
Co-Chair: Mehmet Kaynak, IHP

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<td>R. Weber1, U. J. Lewark2, A. Tessmann1, H. Massler1, A. Leuther1, Fraunhofer-Institute for Applied Solid State Physics (IAF), Freiburg, Germany, IMST GmbH, Kamp-Lintfort, Germany</td>
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<td>T. K. Johansen1, A. Thualfiqar2, N. Weimann1, W. Heinrich1, V. Krozer2, Technical University of Denmark, Kgs. Lyngby, Denmark, Ferdinand-Braun-Institut, Berlin, Germany</td>
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<td>B. Khamaisi, E. Socher, Tel-Aviv University, Tel-Aviv, Israel</td>
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**CMOS Based Transceiver Components**  
Chair: Eric Tournier, University of Toulouse - LAAS/CNRS  
Co-Chair: Norihau Suematsu, Tohoku University

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<td>L. Sziagyi, D. Schoeniger, R. Henkes, F. Ellinger, Technische Universität Dresden, Dresden, Germany</td>
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<td>J. Cheng, Y. Lin, W. Lin, J. Tsai, T. Huang, H. Wang, National Taiwan Normal University, Taipei, Taiwan</td>
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<td>Non-Invasive Highly Integrated Transformer Power Detector for Self-Healing PA in 130nm H9SOI-FEM CMOS Technology</td>
<td>B. Moret1, E. Kerhervé1, V. Kropp2, University of Bordeaux, IMS Laboratory, Talence, France, STMicroelectronics, Crolles, France</td>
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**Room 11**

#### EuMIC09

**Doherty and Envelope Tracking Amplifier Solutions**  
Chair: Paolo Colantonio, University of Rome Tor Vergata  
Co-Chair: Marc van Heijningen, TNO

**Content:**
- All Gallium Nitride Envelope Tracking Multiband Power Amplifier using 200 MHz Switching Buck-Converter
- Optimized Peaking Amplifier of Doherty Amplifier using an Inductive Input Second Harmonic Load
- A Design Approach to Mitigate the Phase Distortion in GaN MMIC Doherty Power Amplifiers
- Novel Output Combiner for Three-Way Doherty Power Amplifiers
- Optimization of Idle Current in Envelope Tracking Power Amplifier for Efficiency and Linearity

#### EuMIC010

**Modelling of Thermal and Trapping Effects in HEMTs**  
Chair: Thomas Brazil, University College Dublin  
Co-Chair: Christopher Duff, The University of Manchester

**Content:**
- Thermal Analysis of AlN/GaN HEMTs grown on Si and SiC Substrate through TCAD Simulations and Measurements
- Anomaly and Intrinsic Capacitance Behaviour over Temperature of AlGaN/GaN/SiC and AlGaAs/GaAs HEMTs for Microwave Applications
- Characterization and Modeling of Traps and RF Frequency Dispersion in AlGaN/AIN/GaN HEMTs
- Characterization of Trapping in a GaN HEMT by Performing Isothermal Three-Stage Pulse Measurements

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**Room 12**

#### EuMIC09

**Doherty and Envelope Tracking Amplifier Solutions**  
Chair: Paolo Colantonio, University of Rome Tor Vergata  
Co-Chair: Marc van Heijningen, TNO

**Content:**
- All Gallium Nitride Envelope Tracking Multiband Power Amplifier using 200 MHz Switching Buck-Converter
- Optimized Peaking Amplifier of Doherty Amplifier using an Inductive Input Second Harmonic Load
- A Design Approach to Mitigate the Phase Distortion in GaN MMIC Doherty Power Amplifiers
- Novel Output Combiner for Three-Way Doherty Power Amplifiers
- Optimization of Idle Current in Envelope Tracking Power Amplifier for Efficiency and Linearity

#### EuMIC10

**Modelling of Thermal and Trapping Effects in HEMTs**  
Chair: Thomas Brazil, University College Dublin  
Co-Chair: Christopher Duff, The University of Manchester

**Content:**
- Thermal Analysis of AlN/GaN HEMTs grown on Si and SiC Substrate through TCAD Simulations and Measurements
- Anomaly and Intrinsic Capacitance Behaviour over Temperature of AlGaN/GaN/SiC and AlGaAs/GaAs HEMTs for Microwave Applications
- Characterization and Modeling of Traps and RF Frequency Dispersion in AlGaN/AIN/GaN HEMTs
- Characterization of Trapping in a GaN HEMT by Performing Isothermal Three-Stage Pulse Measurements

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<td>x 200 um² 2 GaAs pHEMT</td>
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<td>O. Ambacher1, ‘Fraunhofer IAE Freiburg im Breisgau, Germany, ‘University of Extremadura, Cáceres, Spain</td>
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## TUESDAY

### Room 1

**EuMIC/EuMC01**

**ARMS RF and Microwave Society Selected Papers**

Chair: Dominic Fitzpatrick, PowerRFul Microwave  
Co-Chair: Steve Nightingale, Cobham Antenna Systems

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<td>D.W. Glynn, T. He, J. R. Powell, Y. Tian, X. Shang, M. J. Lancaster, The University of Birmingham, Birmingham, United Kingdom</td>
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<td>S. Dumanli, TRL Toshiba Research Europe, Bristol, United Kingdom</td>
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<td>EuMIC/EuMC01-03 Broadband Push-Pull Power Amplifier Design at Microwave Frequencies</td>
<td>R. H. Smith1, S. C. Cripps2, 1Plextek RFI, Chesterford, United Kingdom, 2Cardiff University, Cardiff, United Kingdom</td>
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<td>10:00 - 10:20</td>
<td>EuMIC/EuMC01-04 Understanding the 3 Level Doherty</td>
<td>M. J. Roberts, Slipstream Engineering Design Ltd, Shipley, United Kingdom</td>
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<td>10:20 - 10:40</td>
<td>EuMIC/EuMC01-05 Beyond RF Ablation: Other Uses for RF Within the Body</td>
<td>O. Murphy1, M. R. Bahnmanyar1, C. N. McNelly1, C. Tsoumazou2, M. Yocoub2, 1Analog Devices, Cork, Ireland, 2Imperial College, London, United Kingdom, 3Harefield Hospital, Harefield, United Kingdom</td>
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### Room 4

**EuMC01**

**Waveguide and SIW Components**

Chair: Shokrollah Karimian, CERN  
Co-Chair: Luca Perregrini, University of Pavia

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<td>09:00 - 09:20</td>
<td>EuMC01-01 Wideband Probe-Type Waveguide-to-Microstrip Transition for V-Band Applications</td>
<td>O. Soykin, A. Artemenko, V. Sorin, A. Mzharovskiy, R. Maienirkov, Radio Gigabit LLC, Nizhny Novgorod, Russian Federation</td>
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<td>09:20 - 09:40</td>
<td>EuMC01-02 Rectangular Waveguide-to-Coplanar Waveguide Transitions at U-Band using E-Plane Probe and Wire Bonding</td>
<td>Y. Dong, T. K. Johansen, V. Zhurbenko, P. J. Hamberg, Technical University of Denmark, Kgs. Lyngby, Denmark</td>
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<td>09:40 - 10:00</td>
<td>EuMC01-03 Design of Substrate Integrated Waveguide Structures based on Stop-Band Response FSSs (SBFSS-SIW)</td>
<td>N. Esparza, P. Alcón, L. Herrán, F. Las-Heras, University of Oviedo, Gijón, Spain</td>
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<td>10:00 - 10:20</td>
<td>EuMC01-04 A Study on the Broadband Transitions between Microstrip Line and Post-Wall Waveguide in E-band</td>
<td>Y. Uemichi, O. Nukaga, K. Nakamura, X. Han, R. Nosono, N. Guan, Fujikura Ltd., Sakura, Japan</td>
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<td>10:20 - 10:40</td>
<td>EuMC01-05 Passive Monolithic Microwave Multisensor Based on N Coupled Substrate Integrated Resonators for Environmental Detection</td>
<td>M. Ngyoe1, P. H. Rasombohoangjinjatovo1, N. Y. Sama1, F. Domingue1, D. Deslandes2, 1Université du Québec à Trois-Rivières, Trois-Rivières, Canada, 2Université du Québec à Montréal, Montréal, Canada</td>
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### Room 13

**EuMIC/EuMC02**

**RF MEMS Components and Packaging**

Chair: Stephan Lucyszyn, Imperial College London  
Co-Chair: Kamal K Samanta, AMWT Ltd

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<td>09:00 - 09:20</td>
<td>EuMIC/EuMC02-01 High-Q Tuneable Filter with a Novel Tuning Structure</td>
<td>J. Jang, R. R. Mansour, University of Waterloo, Waterloo, Canada</td>
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<td>09:20 - 09:40</td>
<td>EuMIC/EuMC02-02 Advances in MEMS Switches for RF Test Applications</td>
<td>T. Moran1, C. Keimel2, T. Miller3, 1National Instruments, Santa Rosa, United States, 2Menlo Microsystems, Niskayuna, United States, 3GE Global Research, Niskayuna, United States</td>
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<td>09:40 - 10:00</td>
<td>EuMIC/EuMC02-03 Development of a DC to K-Band Ultra Long On-Life RF MEMS Switch with Integrated Driver Circuitry</td>
<td>E. Carty1, P. Fitzgerald1, P. McDaid1, 1Analog Devices, Limerick, Ireland, 2Analog Devices, Cork, Ireland</td>
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<td>10:00 - 10:20</td>
<td>EuMIC/EuMC02-04 High-Q Zero Level Packaged RF-MEMS Switched Capacitor Arrays</td>
<td>K. Nadaud1, C. Keimel2, T. Miller3, 1National Instruments, Santa Rosa, United States, 2Menlo Microsystems, Niskayuna, United States, 3GE Global Research, Niskayuna, United States</td>
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<td>10:20 - 10:40</td>
<td>EuMIC/EuMC02-05 Thin Film Wafer Level Encapsulated RF-MEMS Switch for D-Band Applications</td>
<td>S. Tolunay Wipf1, A. Göritz1, M. Wietstruck1, 1IHP, Frankfurt (Oder), Germany, 2Technische Universität Berlin, Berlin, Germany, 3Sabanci University, Istanbul, Turkey</td>
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<td><strong>EuMIC16</strong>&lt;br&gt;CMOS and BiCMOS Power Amplifiers&lt;br&gt;Chair: Eric Kerherve, IMS Bordeaux&lt;br&gt;Co-Chair: Patrick Schuh, Airbus EDS</td>
<td><strong>EuMIC17</strong>&lt;br&gt;Novel Modelling Techniques for Microwave Circuit Design&lt;br&gt;Chair: M. A. Khan, IEMN, France&lt;br&gt;Co-Chair: Patrick Schuh, Airbus EDS</td>
<td><strong>EuMC02</strong>&lt;br&gt;Antenna Substrates&lt;br&gt;Chair: Peter Gardner, University of Birmingham&lt;br&gt;Co-Chair: Matthias Heir, University of Ilmenau</td>
<td><strong>EuMIC18</strong>&lt;br&gt;High Power and T/R Modules - GaN Based Components&lt;br&gt;Chair: Massimo C. Compagnini, Telespazio&lt;br&gt;Co-Chair: Georg Böck, TU Berlin</td>
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| **EuMIC16-01**<br>A Broadband 100-180 GHz Power Amplifier with 11 dB Peak Output Power and 1.3 THz GBW in 130 nm SiGe BiCMOS<br>F. Ahmed, F. Funan, K. Kullen, K. Stelzer, Johannes Kepler University, Linz, Austria, Infineon Technologies AG, Munich, Germany | **EuMIC17-01**<br>Prediction of Odd-Mode Instabilities under Output Mismatch Effects<br>F. Ramirez, A. Suarez, S. Sanchez, University of Cantabria, Santander, Spain | **EuMC02-01**<br>Design and Experimental Characterization of Surfaces with Low Radar Cross-Section at Millimetre-Wave Frequences<br>C. Vasaneli, F. Braegelsack, C. Waldschmidt, Ulm University, Ulm, Germany | **EuMIC18-01**<br>Compact GaN MMIC T/R Module Front-End for X-Band Pulsed Radar<br>A. Brandt, S. D’Angelo, F. Scappaviva, D. Resca, V.A. Monaco, MEC - Microwave Electronics for Communications, Bologna, Italy |

| **EuMIC16-02**<br>14 dBM, 18-20 GHz Injection-Locked Power Amplifier with 45% PAE in 65 nm CMOS<br>A. Hamed, M. Saeed, R. Negra, RWTH Aachen, Aachen, Germany | **EuMIC17-02**<br>Broadband Non-Linear FET Behavioral Model Defined in the Admittance Domain<br>M. Moore, M. Fernandez-Barciela, M. Casbon, P. L. Tasselli, Universidad de Vigo, Vigo, Spain, Cardiff University, Cardiff, United Kingdom | **EuMC02-02**<br>A High Efficiency Planar W-Band Array Antenna<br>Z. Hao, Q. Yuan, Z. Song, Southeast University, Nanjing, China | **EuMIC18-02**<br>Overview of the MAGNUS Project<br>P. Duve, B. Mallet-Guy, Y. Manojo, C. Tolan, P. Schuh, N. Bliederm, H. Brueck, D. Horne, R. Fazzolari, Thales Systemes Aeropote Jacques Saillant, France, Thales Air System SAS, Yame, France, Yatebu DS, Ulm, Germany, Saab AB, Gothenburg, Sweden, Thales Nederland BV, Hengelo, Netherlands, Sense ES Limited, Basildon, United Kingdom, Thales UK Limited, Crawley, United Kingdom |

| **EuMIC16-03**<br>15 GHz 25 dBM Multigate-Cell Stacked CMOS Power Amplifier with 32% PAB and ±30 dB Gain for 5G Applications<br>N. Rostomyan, L. A. Jayam, P. M. Asbeck, UC San Diego, La Jolla, United States | **EuMIC17-03**<br>Fast Extraction of Accurate I/V Models for Harmonically-Tuned Power Amplifier Design<br>V. Vadali, A. Raffo, G. Bossi, G. Vannini, P. Colantonio, F. Giannini, University of Ferrara, Ferrara, Italy, University of Roma Tor Vergata, Rome, Italy | **EuMC02-03**<br>Low Side Lobe Cylinder Conformal Omnidirectional Millimetre Wave Microstrip Antenna Design<br>J. Liu, Y. Wang, F. Lu, H. Zhao, L. Wang, Nanjing University of Science and Technology, Nanjing, China, University of Ontario Institute of Technology, Oshawa, Canada | **EuMIC18-03**<br>A Q-Band Power Amplifier MMIC using 100 nm AlGaN/GaN HEMT<br>P. Feuerschütz, C. Frieske, R. Quay, A. F. Jacob, Technische Universität Hamburg-Harburg, Hamburg, Germany, Fraunhofer Institute for Applied Solid-State Physics IAE, Freiburg, Germany |


| **EuMIC16-05**<br>Highly Linear Wideband CMOS RF Power Amplifier with Active Feedback in 130 nm CMOS Technology<br>M. Khan, P. Rousseaud, R. Negra, RWTH Aachen University, Aachen, Germany | **EuMIC17-05**<br>Inverse Surrogate Models for Fast Geometry Scaling of Miniaturized Dual-Band Couplers<br>S. Koziel, A. Bekas, University of Reykjavik, Iceland, Gdansk University of Technology, Gdansk, Poland | **EuMC02-05**<br>High Gain Antenna for Millimetre-Wave Communications<br>A. Martinez, J. Strojijn, D. Valcarcel, J. Teniente, Antenna, S.L., Pamplona, Spain, Universidad Pública de Navarra, Pamplona, Spain | **EuMIC18-05**<br>Dependence of a Hybrid 125 W S-Band Switch-Limiter Receiver Protectors’ Performance on Packaging Technique<br>J. L. Brogle, J. G. Bukowski, T. E. Boles, MACOM Technology Solutions Holdings, Inc., Lowell, United States |
TUESDAY

EuMW01
EuMW/EuMC Opening Session
Chair: Andrew Gibson, EuMW 2016 General Chair
Co-Chair: Ian Hunter, EuMC 2016 Chair

11:20 - 11:50 Welcome Addresses
Opening of the European Microwave Week 2016
Andrew Gibson, EuMW 2016 General Chair

EuMA Welcome Address
Wolfgang Heinrich, EuMA President

Greetings from IEEE MTT-S
Ke Wu, IEEE MTT-S President

Opening of the European Microwave Conference 2016
Ian Hunter, EuMC 2016 Chair

11:50 - 12:20
Awards Ceremony
Alexander Yarovoy, EuMA Awards Chair

EuMA Distinguished Service Award
EuMA Outstanding Career Award

12:20 - 13:00
Keynote Speech
Quantum Flexible Payloads for Telecoms Satellites
By Glyn Thomas, Payload Director of Airbus

The role of satellites in the communications value chain is rapidly changing. The traditional model of using simple bent pipe satellites for broadcasting TV channels via wide coverage beams to hundreds of millions of satellites subscribers is under threat by the provision of on demand over the top services such as Netflix and NowTV. However this threat is also an opportunity. The demand for mobile data using “bring your own devices” in the domains on Aeronautical and Maritime via local WiFi networks supplied by satellite links is exponentially exploding. This wind of change is pulling a tremendous amount of innovation into the design of communications satellite payloads. This innovation is enabled by state of the art RF and Microwave technologies including:

• Active Antennas, using T/R modules in Ku and Ka bands with GaN SSPA
• State of the art beamforming networks both analogue and digital
• State of the art flexible filtering and routing approaches both analogue and digital.

The key note speaker will address these winds of change and how what has historically be a conservative cautious industry is rising to the challenge of a changing world and new means of consumption of information / data.
EuMC Poster 01 Session
Chair: Rob Sloan, University of Manchester
13:00 – 14:20
The posters are on display from 13:00 – 14:20
The authors are present for discussion from 13:00 – 14:20

TUESDAY
## TUESDAY

**EuMC Poster01 Session**  
Chair: Rob Sloan, University of Manchester  
13:00 – 14:20  
The posters are on display from 13:00 – 14:20  
The authors are present for discussion from 13:00 – 14:20

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| **EuMC Poster01-28**  
Comparison of Filter Bank Multi-Carrier and Orthogonal Frequency-Division Multiplexing RFPA Linearisation Requirement  
K. N. Gebremicaid, K. Morris, S. Ben Smida, M. Beach, S. Wales, M. Kyriacou  
1University of Bristol, Bristol, United Kingdom, 2Roke Manor Research Limited, Romsey, Hampshire, United Kingdom  

**EuMC Poster01-29**  
The Two-Tone Model for Power Amplifier Modeling  
T. R. Cunha, F. M. Barradas, J. C. Pedro  
Universidade de Aveiro - Instituto de Telecomunicacoes, Aveiro, Portugal

**EuMC Poster01-30**  
160 W Peak Highly Linear Multilevel Outphasing Transmitter  
C. T. Nghe, J. Guan, D. Maassen  
1University of Leipzig, Leipzig, Germany, 2Université Jean Monnet, Saint-Etienne, France

**EuMC Poster01-31**  
Phase Control in Photonically-Steered Phased Array Transmitters by Optical Homodyne Detection  
K. Kolpatzeck, L. Häring, A. Czylwik  
1University of Duisburg-Essen, Duisburg, Germany

**EuMC Poster01-32**  
Experimental Test of a W-band Gyro-TWA for Cloud Radar Application  
University of Strathclyde, Glasgow, United Kingdom

**EuMC Poster01-33**  
Novel Microwave Diode for Millimetre Waves on the Base of Asymmetrically-Doped Semiconductor Structure  
A. Szuiedelišis, S. Almontas, J. Gradauskas, V. Grutūnaitis, A. Lučiūn, A. Cerkūnas, Center for Physical Sciences and Technology, Vilnius, Lithuania

**EuMC Poster01-34**  
Frequency Sensitive Effect of Rectifying FET Terahertz Detectors  
A. G. Golentov, F. F. Szov, I. O. Lykyuk  
Institute of Semiconductor Physics of Ukrainian NAS, Kyiv, Ukraine

**EuMC Poster01-35**  
Waveguide Modal Approximation Method for Plane Wave Incidence to Aperture using Mode-Matching Method  
J. Jang, C. Choct, Y. Chung, J. So  
University of Seoul, Seoul, Republic of Korea, 1Kwangwoon University, Seoul, Republic of Korea, 2The Agency for Defense Development, Daejeon, Republic of Korea

**EuMC Poster01-36**  
Reduced-Complexity E-Band VNA with Tethered Far-Reaching Reflectometers  
K. M. Noueijim, T. H. Roberts, Anritsu Company, Morgan Hill, United States

**EuMC Poster01-37**  
A Multi-Tone Load Pull Measurement System for On-Wafer Characterization of Microwave Power Transistors  
S. Lauret, S. Khajepour, O. Raymond, S. Jacques  
XLIM, Brive La Gaillarde, France, 1XLIM / United Monolithic Semiconductors, Brive La Gaillarde, France, 2XLIM, Limoges, France

**EuMC Poster01-38**  
120° Accesses CPW Transmission Lines for TRL Calibration Standards in a Band of 20-67 GHz  
A. Usman Bechir, Y. Didier  
Laboratoire Hubert Curien, Saint-Étienne, France

**EuMC Poster01-39**  
Robotic Flange System for Active Alignment of Microwave, Millimetre-Wave and Terahertz Waveguides  
I. D. Robertson, Y. Alkhoshid, University of Leeds, Leeds, United Kingdom, 2Chemnitz University of Technology, Chemnitz, Germany

**EuMC Poster01-40**  
Agile and Compact Near-Field Analyses of Onboard Bluetooth Module by Live Electrooptic Imaging  
M. Tsujiya, T. Shiozawa  
1National Institute of Information and Communications Technology, Koganei, Japan, 2National Institute of Technology, Kagawa College, Mitoyo, Japan

**EuMC Poster01-41**  
Frequency Detection Method with Transversal Filters  
K. Tajima, M. Hieda, Mitsubishi Electric Corp., Kamakura, Japan

**EuMC Poster01-42**  
Permittivity Measurements and Associated Uncertainties up to 110 GHz in Circular-Disk Resonator Method  
Y. Kata, M. Honke, National Institute of Advanced Industrial Science and Technology, Central 3, 1-1-1 Umecstosu, Tsukuba, Japan

**EuMC Poster01-43**  
Power Maximization in a WPT Link using Three Transmitters and a Single Receiver  
G. Moret, A. Costanzo, F. Mastrì, M. Mongiardino, L. Tarticolone  
University of Salento, Lecce, Italy, 1University of Bologna, Bologna, Italy, 2University of Perugia, Perugia, Italy

**EuMC Poster01-44**  
Open-Loop Maximum Efficiency Tracking Wireless Power Transfer System for Biomedical Implants  
S. Khang, S. Chae, Y. Lee, J. Yu  
Advanced Institute of Science and Technology, Daenoeun, Republic of Korea

**EuMC Poster01-45**  
Impact of Multisine Excitation Design on Rectifier Performance  
M. Rajabi, N. Pan, S. Pollin, D. Schreurs  
KU Leuven, Leuven, Belgium
EuMC03
IoT, UWB and Wireless Sensor Networks
Chair: Manos Tentzeris, Georgia Institute of Technology
Co-Chair: Daniela Dragomirescu, LAAS-CNRS, Université de Toulouse

EuMC03-01
LF RFID Chequered Loop Antenna for Pebbles on the Beach Detection
A. M. Diet1, M. Grzeskowiak2, Y. Le Bihan1, M. Biancheri-Astier3, A. Pozzebon4, M. Benamara2, C. Conessa1, G. Lissorgues1, E. Alves1, S. Eiseur1, G. Purnell1, S. Majied5, L. Chabert1, 1GeePS UMR 8507, Univ. Paris Saclay, CNRS, France, 2ESYCOM EA 2552 (UPEMLV ESIEE Paris CNAM), Marne la Vallée / Noisy le Grand, France, 3GEOPS/gpis UMR 8148, Orsay, France, 4University of Siena, Siena, Italy

EuMC03-02
Chipless Substrate Integrated Waveguide Tag using Time-Domain Reflectometry Technique for Millimetre-Wave Identification (MMID)
J. Li, T. Djerfi, F. Ren, K. Wu, Ecole Polytechnique de Montréal, Montreal, Canada

EuMC03-03
Wireless Passive Sensor Interrogation Technique Based on a Three-Dimensional Analysis
D. Henry1,2, H. Aubert1,2, P. Pons1, 1LAAS-CNRS, Toulouse, France, 2Université de Toulouse INP, Toulouse, France

EuMC03-04
Measurement and Analysis of Radiated Emissions from Coupled UAV and Smart RFIC Objects
S. Wane1, D. Bajon2, J. Russer3, P. Russer3, J. Gros2, J. Moschetta2, D. Thomas2, 1NXP-Semicon, Colombelles, France, 2Université de Toulouse INP, Toulouse, France, 3TUM, München, Germany

EuMC03-05
A 3D-Modulated Delay-Line Based Chipless TDR UWB RFID System with High Suppression of Multiple Reflections
M. Pöpperl1, T. Frank1, C. Mandel2, R. Jakoby1, M. Vossiek1, 1Friedrich-Alexander-University Erlangen-Nürnberg, Erlangen, Germany, 2Technische Universität Darmstadt, Darmstadt, Germany

EuMC19
Millimetre-Wave Signal Generation
Chair: Michael Schlechtweg, Fraunhofer IAF
Co-Chair: Shmuel Auster, Elta Systems Ltd.

EuMIC19-01
Wideband 148-188 GHz Push-Push VCO using Variable Inductance and Capacitance
J. Al-Eryani1,2, H. Knapp2, H. Li1, J. Wursthorn1, K. Aufinger2, S. Majied5, S. Boguth1, R. Lachner1, J. Boeck1, L. Maurer1, 1Universität der Bundeswehr München, Neubiberg, Germany, 2Infinion Technologies AG, Neubiberg, Germany

EuMIC19-02
Design of Voltage Controlled Oscillators (VCOs) in D-Band and their Phase Noise Measurements using Frequency Down-Conversion
U. Ali, A. Thiede, M. Bober, University of Paderborn, Paderborn, Germany

EuMIC19-03
Millimetre-Wave Linear Fast-Chirp Pulse Generator in 65-nm CMOS Technology
H. Matsumura, Y. Yagishita, I. Soga, Y. Kawano, T. Iwai, Fujitsu Laboratories Limited, Atsugi, Japan

EuMIC19-04
A 61 GHz Frequency Synthesizer in SiGe BiCMOS for 122 GHz FMCW Radar
A. Ergintav1, Y. Sun2, F. Herzel1, H. J. Ng1, G. Fischer1, D. Kissinger1, 1IHP, Frankfurt (Oder), Germany, 2HK Microsystem Integration Ltd., Hong Kong, China, 3Technische Universität Berlin, Berlin, Germany

EuMIC19-05
Transceiver MMICs for Street Surveillance Radar
K. Tsukashima, O. Anegaywa, T. Kawasaki, A. Otaka, M. Kubota, T. Okumitsu, S. Ogita, Sumitomo Electric Industries LTD, Yokohama, Japan
Room 12

**EuMC04**

**Systems and Applications 1**

Chair: Wolfgang Bösch, University of Graz
Co-Chair: Steve Nightingale, Cobham Antenna Systems

**EuMC04-01**

A Digitally Assisted Analog Cancellation System at RF Frequencies for Improving the Isolation Performance of a Ceramic Duplexer

H. Su, R. Farrell, National University of Ireland, Maynooth, Maynooth, Ireland

**EuMC04-02**

Compact Reconfigurable Industry-Level Ka-Band Switch Matrix Payload Module for Geostationary Satellite Operation

A. Ebert, J. Mueller, R. Stephan, D. Stoop, F. Kaeser, W. Konrath, M. A. Hein, Technische Universität Ilmenau, Ilmenau, Germany, 2Tesat Spacecom GmbH, Backnang, United States

**EuMC04-03**

Millimetre-Wave Sourceless Receiver Embedded with DoA Estimation

R. Liu, Y. Zhao, K. Wu, École Polytechnique de Montréal, Montreal, Canada

**EuMC04-04**

Active Imaging of Glass Fiber Reinforced Plastic using Millimetre Wave Radiometry

C. Vegas, B. Alderman, P. Haggard, J. Powell, K. Parow-Souchon, M. Firdaus, H. Liu, R. Skán, C. Dufy, The University of Manchester, Manchester, United Kingdom, 2Teratech Components Ltd., Oxford, United Kingdom, 3STFC Rutherford Appleton Laboratory, Oxford, United Kingdom

**EuMC04-05**

Microwave Spectroscopy: Novel Cost-Effective Approach to Measure Drip Loss in Pork Loin

A. Mason, B. Abdulllah, M. Muradov, O. Korostynska, A. Al-Shamma’a, K. Lunde, S. Bjarnadottir, O. A. Alvseike, Liverpool John Moores University, Liverpool, United Kingdom, 2Animalia, Oslo, Norway

Room 1

**EuMC/EuMC03**

**THz Photonics Electronic Components and Systems**

Chair: Mohamed Elkholy, Robert Bosch Co-Chair: Antti Räsänen, Aalto University

**EuMC/EuMC03-01**

Photonic BiCMOS Technology – Enabler for Si-Based, Monolithically Integrated Transceivers Towards 400 Gb/s


**EuMC/EuMC03-02**

GaN Laser Driver Switching 30 A in the Sub-Nanosecond Range

A. Liero, A. Klehr, T. Hoffmann, T. Przivarka, W. Heinrich, Ferdinand-Braun-Institut, Leibniz-Institut für Höchtfrequenztechnik, Berlin, Germany

**EuMC/EuMC03-03**

Electronic Stabilization Methods for a Single-Loop Opto-Electronic Oscillator

M. A. Ilgaz, L. Bogataj, B. Batagelj, M. Vidmar, University of Ljubljana, Ljubljana, Slovenia

**EuMC/EuMC03-04**

High Conversion Gain 100 GHz Photoreceiver Integrated with UTC-PD and PHEMT Amplifier for 92 GHz Carrier, 10.7 Gbps Photonic Wireless Communication


**EuMC/EuMC03-05**

Characterization of Sub-THz Detection Array in 0.18 µm CMOS Technology

J. Chen, W. Liu, P. Yan, C. Jia, D. Hou, W. Hong, Southeast University, Nanjing, China

Room 4

**EuMC/EuMC04**

**Components for Receivers**

Chair: Philippe Descamps, University of Caen Co-Chair: Jan Grahn, Chalmers University of Technology

**EuMC/EuMC04-01**

Geodetic VLBI Ultra Low Noise Broad-Band Receiver for 13 Meter VOGS Radiotelescopes

P. Garcia-Carreño, S. García-Alvaro, R. Sanchez-Montero, J. A. López-Pérez, M. Patino, J. A. Menéndez, P. López-Enríquez, P. López-Espín, Instituto Geográfico Nacional, Yebes, Spain, 2University of Alcalá, Alcalá de Henares, Spain

**EuMC/EuMC04-02**

Self-Biasing Effects Induced by RF Step-Stress in Ka-Band LNAs based on InAl/Ga HEMT Technology

J. Tarrain, S. Nielse, S. Piotrovicki, S. Delage, 1LAAS-CNRS and University of Toulouse (UPS), Toulouse, France, 2Thales Research Technology, III-V Lab, Palaiseau, France

**EuMC/EuMC04-03**

A Millimetre-Wave Ultra-Wideband Reflection-Type Phase Shifter in BiCMOS 55 nm Technology

Z. Iskandar, J. Alvarez, A. Bautista, E. Pistone, V. Payral, A. Silligaris, P. Poveda, 1University of Grenoble Alpes, IMEP-LAHC Laboratory, Grenoble, France, 2University of Grenoble Alpes, CE-LETI, Minatec Campus, Grenoble, France

**EuMC/EuMC04-04**

Mixer Linearization using a Dynamic Bias Circuit with an Integrated Diode Linearizer

B. Shi, Institute for Infocomm Research, Singapore, Singapore

**EuMC/EuMC04-05**

A High Image Rejection E-Band Sub-Harmonic IQ Demodulator with Low Power Consumption in 90 nm CMOS Process

Y. T. Chou, Y. H. Lin, H. Wang, National Taiwan University, Taipei, Taiwan
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<td><strong>EuMIC/EuMC05</strong>&lt;br&gt;Multi-Functional Tuneable Filters for Wireless Applications&lt;br&gt;Chair: Mehmet Karaaslan, e2v Technologies&lt;br&gt;Co-Chair: Jose L. Alonso, Technical University of Madrid</td>
<td><strong>EuMIC/EuMC06</strong>&lt;br&gt;Packaged and Integrated High-Power Amplifiers&lt;br&gt;Chair: Peter Aaren, University of Surrey&lt;br&gt;Co-Chair: Olaf Bengtsson, FBH</td>
<td><strong>EuMIC/EuMC07</strong>&lt;br&gt;Packaging and Multi-chip Modules&lt;br&gt;Chair: Pierre Blondy, XJIM CNRS Universite de Limoges&lt;br&gt;Co-Chair: Fabio Coccetti, LAAS-CNRS</td>
</tr>
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**EuMIC/EuMC05-01**<br>A Band-Switchable and Tuneable Nested Bandpass Filter With Continuous 0.4–3GHz Coverage<br>K. Motoi, K. Kunihito, NEC, Kawasaki, Japan

**EuMIC/EuMC06-01**<br>A Packaged Hybrid Doherty PA for Microwave Links<br>D. Gustafsson, K. Andersson, A. Leidenhed, A. Rhodin, T. Wiegeland, Ericsson AB, Gothenburg, Sweden

**EuMIC/EuMC07-01**<br>Dielectric Material Characterization of High Frequency Printed Circuit Board Laminates and an Analysis of their Transmission Line High Frequency Losses<br>B. Curtis¹, C. Tschoban², A. Ipompe², H. Kroener¹, I. Nüppel³, K. Lang³, " Fraserhofer - IZM, Berlin, Germany; ¹Isola GmbH, Düren, Germany

**EuMIC/EuMC05-02**<br>Hairpin Bandpass Filter With Tuneable Center Frequency and Tuneable Bandwidth Based on Screen Printed Ferroelectric Varactors<br>C. Schuster, A. Wiens¹, M. Schüller¹, C. Kohler¹, J. Binder¹, R. Jakoby¹, " TU Darmstadt, Darmstadt, Germany; ¹Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

**EuMIC/EuMC06-02**<br>A 2.6 GHz Band 78 W Doherty Power Amplifier with GaN HEMT Unit-Cell Structure Robust for Layout-Dependent Loop Oscillation<br>S. Imai¹, S. Watanabe¹, Y. Komatsuzaki¹, H. Okazaki¹, S. Shinjo¹, K. Yamakawa¹, Y. Sakaki¹, H. Katayama¹, A. Inoue¹, "Mitsubishi Electric Corporation, Ibaraki, Japan; ¹Mitsubishi Electric Corporation, Ofuna, Japan

**EuMIC/EuMC07-02**<br>Technology Platform for Millimetre-wave Applications Metallic-nanowire-Membrane (MnM)<br>M. V. Pelegri¹, J. M. Pinheiro¹, L. A. Gomes¹, F. Podevin², P. Ferrari², G. P. Rehder¹, A. L. Serrano¹, "University of São Paulo, São Paulo, Brazil; ¹Université Grenoble Alpes, Grenoble, France

**EuMIC/EuMC05-03**<br>An Integrated Tuneable Electrical-Balance Filter with 60 dB Stopband Attenuation and 1.75–3.7 GHz Stopband Tuning Range<br>B. van Liempd¹,², B. Hershberg¹, P. Wambacq¹,², J. Cnarecker¹,³, "IMEC, Leuven, Belgium; ¹Vrije Universiteit Brussel, Brussels, Belgium

**EuMIC/EuMC06-03**<br>Linearity Enhancement in CMOS Power Amplifier Design by using Varactor-Embedded Output Matching Network<br>C. Zhai, K. K. M. Cheng, " The Chinese University of Hong Kong, Shatin, Hong Kong

**EuMIC/EuMC07-03**<br>Differential Wideband Interconnects for Organic Millimetre-Wave Chip Packages - An Effort to Design an All-Purpose RF Chip Package<br>F. X. Röhrl¹, J. Jakob¹, W. Bogner¹, D. Hageneder², S. Zorn³, "THD Technische Hochschule Deggendorf, Deggendorf, Germany; ¹University of São Paulo, São Paulo, Brazil; ³University Grenoble Alpes, Grenoble, France

**EuMIC/EuMC05-04**<br>Dual-Mode-Resonator-Based Pseudo-Elliptic Filters with Tuneable Response<br>A. B. Althman-Al-Amri, F. Gentili, S. W. Sattler, W. Bösch, "Graz University of Technology, Graz, Austria

**EuMIC/EuMC06-04**<br>A 20 W and Broadband Two-stage LDAMOS Power Amplifier with High-Q Cu Integrated Passive Device for Multi-Band and Multi-Standard Applications<br>S. Min¹, J. Kim¹, M. Szymanowski¹, G. Tucker², NXP, Chandler, United States

**EuMIC/EuMC07-04**<br>Low-Cost Antenna-in-Package Solution for 122 GHz Radar Module<br>A. Bhutani¹, B. Goettel¹, J. Streitz², S. Schurr², W. Winkler², J. Zwick², "Karlsruhe Institute of Technology, Karlsruhe, Germany; ²Silicon Radar GmbH, Frankfurt (Oder), Germany

**EuMIC/EuMC05-05**<br>High Performance Plastic Packaged 100 W L-band Quasi-MMIC HPA<br>D. Boure¹, P. Sir¹, M. Camiade¹, J. P. Vial¹, UMS, Villebon-sur-Yvette, France

**EuMIC/EuMC07-05**<br>3D Inkjet Printed Radio Frequency Inductors and Capacitors<br>M. Vaseem¹, G. McKerricher¹, A. Shamin¹, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia

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**TUESDAY**

14:20 - 14:40 <br>**EuMIC/EuMC05-01**

14:40 - 15:00 <br>**EuMIC/EuMC06-01**

15:00 - 15:20 <br>**EuMIC/EuMC07-01**

15:20 - 15:40 <br>**EuMIC/EuMC06-02**

15:40 - 16:00 <br>**EuMIC/EuMC07-02**
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| EuMC05  | Millimetre-Wave Antennas | Chair: Lorenz-Peter Schmidt, University of Erlangen  
Co-Chair: Ioan Lager, Delft University of Technology | |
| EuMC06  | Metamaterial Circuits and Modelling | Chair: Ferran Martin, Universitat Autonoma de Barcelona  
Co-Chair: Amr M.E. Safwat, Ain Shams University | |
| EuMC05-01 | Compact Inkjet-Printed Broadband Filters with Triple Bandnotch for Wireless Applications | W. Ahmad, C. Zlebic, D. Budimir  
1University of Westminster, London, United Kingdom  
2University of Novi Sad, Novi Sad, Yugoslavia | |
| EuMC06-01 | Analytical Modeling of Non-Symmetric and Non-Uniform Compound Gratings | C. Molero, R. Rodiguez-Berral, F. Mesa, F. Medina, University of Sevilla, Seville, Spain | |
| EuMC06-02 | Slow-Wave Inductively-Loaded Electromagnetic Bandgap (EBG) Coplanar Waveguide (CPW) Transmission Lines and Application to Compact Power Dividers | P. Velez, J. Selga, J. Bonache, F. Martin, Universitat Autonoma of Barcelona, Bellaterra, Spain | |
| EuMC05-03 | Inkjet Printed and Folded LTE Antenna for Vehicular Application | B. Sanz-Izquierdo, S. Jun, J. Heirons, T. B. Baydur, University of Kent, Canterbury, United Kingdom | |
| EuMC06-03 | A New RF Interference Cancellation using A Novel 3-Pole Bandstop Resonator Designed using Tapped CRLH T-Line Model | S. A. Ibrahim, R. Farrell, Maynooth University, Maynooth, Ireland | |
| EuMC05-04 | Design of Electrically Small Antennas with Inkjet-Printing Technology | S. Genovesi, F. Costa, A. Monorchio, Università di Pisa, Pisa, Italy | |
| EuMC06-04 | Highly Miniaturized Wideband Negative Group Delay Circuit using Effective Negative Dielectric Permittivity Stopband Microstrip Lines | H. Taheer, R. Farrell, Maynooth University, Maynooth, Ireland | |
| EuMC05-05 | Design and Development of a Compact Wearable Dipole GPS Antenna | S. Ismail, A. Barton, P. Gaydecki, S. Karimian, N. Karimian  
1University of Manchester, Manchester, United Kingdom  
2CERN, Geneva 23, Switzerland | |
| EuMC06-05 | Proposal and Theoretical Design of THz Bandpass Filters using Metallic Photonic Crystal Resonators | C. Chen, T. Anada, S. Takeda, Z. Ma  
1Kanagawa University, Yokohama, Japan  
2Antenna Giken Co., Ltd, Saitama, Japan  
3Saitama University, Saitama, Japan | |
EuMIC20
EuMIC Closing Session
Chair: Tom Brazil, EuMIC 2016 Chair
Co-Chair: Stepan Lucyszyn, EuMIC 2016 Co-Chair

16.40 – 17.20
Foundry Session
Chair: Massimo Comparini, Telespazio, Italy & France

Several key representatives of RF and microwave semiconductor foundries will give short presentations of their foundry capabilities with respect to the Impact of Advanced GaN and Silicon Technologies for Military and Space Applications. This includes details of current fully-released and commercially available processes and processes in development. There will also be opportunity for questions and answers during this interactive forum.

17.20 – 18.00
Balanced Microwaves
Steve C. Cripps, Cardiff University, UK

The “balanced” term has two very different interpretations at microwave frequencies. Differential circuits are widely used in low frequency electronics, offering many advantages particularly in enabling fully integrated circuit functions to be implemented. But the extension of differential balanced techniques into the GHz frequency regime continues to pose problems inasmuch as microwave transmission and measurement have always been implemented using unbalanced, or “grounded” signals. In an earlier era, a different kind of “balanced” microwave circuit received much attention and paid many bills. The quadrature balanced circuit has a different set of advantages but has been in a state of decline over the last couple of decades. Both approaches will be reviewed in this paper, and examples of broadband high efficiency RFPAs implemented in multi-layer (“LCP”) technology using both kinds of balanced configuration will be described. These results point to a pressing need for a mature and reliable multilayer integrated process that is still absent from the microwave designer’s toolbox.

18.00 – 18.10
EuMIC Awards Ceremony
Ali Rezazadeh, EuMW 2016 Awards Chair
EuMIC Prize
EuMIC Young Engineer Prize
GAAS Association Student Fellowships

18.10 – 18.20
Closing of EuMIC 2016
Tom Brazil, EuMIC 2016 Chair

Invitation to EuMIC 2017 in Nuremberg
Ingmar Kallfass, EuMIC 2017 Chair
## TUESDAY

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<td>Lossy and Multi-Band Filters</td>
<td>Advanced 5G Technologies</td>
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<td>Chair: Ian Hunter, University of Leeds</td>
<td>Chair: Arne Jacob, Hamburg University of Technology</td>
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<td>Co-Chair: Giuseppe Macchiarella, Politecnico di Milano</td>
<td>Co-Chair: Christian Person, Telecom Bretagne</td>
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<td>Novel Lossy Microstrip Filter with Extracted-Pole Technique</td>
<td>Massive MIMO for Energy-Efficient Communications</td>
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<td>Z. Zhou, J. Ni, J. Hong, Heriot-Watt University, Edinburgh, United Kingdom</td>
<td>C. Desot, B. Debaillie, IMEC, Leuven, Belgium</td>
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<td>RF System Requirement Analysis and Simulation Methods Towards 5G Radios using Massive MIMO</td>
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<td>S. Seoeng, P. Wong, S. Cheab, Universiti Teknologi PETRONAS, Seri Iskandar, Malaysia</td>
<td>T. Tuovinen, N. Tervo, A. Pärssinen, Centre for Wireless Communications, University of Oulu, Oulu, Finland</td>
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<td>Signal Decomposition Technique for Enhanced Power Added Efficiency of OFDM Transmitters and its Application for MIMO Systems</td>
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<td>Y. Shirato, M. Muraguchi, Graduate School of Engineering, Tokyo University of Science, Tokyo, Japan</td>
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<td>R. H. Geschk, L. Nepaya, University of Cape Town, Cape Town, South Africa</td>
<td>E. Sasaki, M. Hirabé, T. Maru, N. Zen, NEC Corporation, Nakahara-ku, Japan, NEC Corporation, Nakahara-ku, Japan, NEC Europe Ltd, South Ruislip, United Kingdom</td>
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<td><strong>EuMC09</strong>&lt;br&gt;Novel Electromagnetic Techniques for Microwave Components&lt;br&gt;Chair: Hervé Aubert, LAAS-CNRS&lt;br&gt;Co-Chair: Sascha Meyne, Hamburg University of Technology</td>
<td><strong>EuMC10</strong>&lt;br&gt;Digital Predistortion&lt;br&gt;Chair: Georg Fischer, FAU&lt;br&gt;Co-Chair: Nutapong Somjit, University of Leeds</td>
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<td><strong>EuMC09-01</strong>&lt;br&gt;Concept for Equivalent Dielectric Constant of Planar Transmission Lines on Anisotropic Substrates&lt;br&gt;P. I. Dankov, Sofia University, Sofia, Bulgaria</td>
<td><strong>EuMC10-01</strong>&lt;br&gt;Digital Predistorter Model Derivation Based on Iterating Learning Control&lt;br&gt;J.A. Chani-Cahuana¹, P. N. Landin², C. Fager¹, T. Eriksson¹, ¹Chalmers University of Technology, Gothenburg, Sweden, ²Ericsson, Kumla, Sweden</td>
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<td><strong>EuMC09-02</strong>&lt;br&gt;A Virtual Lossy Dielectric Model with Composite Boundary Conditions for the Analysis of Substrate Integrated Waveguides&lt;br&gt;C. A. Leal-Sevillano¹, J. A. Ruiz-Cruz², J. R. Montejo-Garai³, J. M. Rebollar³, ¹Universidad Politecnica de Madrid, Madrid, Spain, ²Universidad Autonoma de Madrid, Madrid, Spain</td>
<td><strong>EuMC10-02</strong>&lt;br&gt;Comparison of Model Order Reduction Techniques for Digital Predistortion of Power Amplifiers&lt;br&gt;P. L. Gilabert¹, G. Montoro¹, I. Wang¹, M. N. Ruiz¹, J.A. Garcia¹, ¹Universitat Politècnica de Catalunya, Castelldefels, Spain, ²Universidad de Cantabria, Santander, Spain</td>
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<td><strong>EuMC09-03</strong>&lt;br&gt;Modeling of Inhomogeneous and Lossy Components by the BI-RME Method and the Segmentation Technique&lt;br&gt;S. Battistutta, M. Bozzi, M. Bressan, M. Pasian, L. Perregini, University of Pavia, Pavia, Italy</td>
<td><strong>EuMC10-03</strong>&lt;br&gt;Concurrent Dual-Band Power Amplifier Model Modification using Dual Two-Tone Test&lt;br&gt;S. Amin¹,², Z. A. Khan¹, M. Isaksson¹, P. Handel¹, D. Ronnow¹, ¹University of Gävle, Gavle, Sweden, ²KTH Royal Institute of Technology, Stockholm, Sweden</td>
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<td><strong>EuMC09-04</strong>&lt;br&gt;Equivalent Surface Impedance Based Mixed-Potential Integral Equation for 3-D Model of On-Chip Passive Components&lt;br&gt;Y. Zhao¹, G. Xiao¹, F. Ling², J. Mao³, ¹Shanghai Jiao Tong University, Shanghai, China, ²Xpeedic Technology, Inc., Bellevue, United States</td>
<td><strong>EuMC10-04</strong>&lt;br&gt;Optimal Sizing of Generalized Memory Polynomial Model Structure Based on Hill-Climbing Heuristic&lt;br&gt;S. Wang¹,², M. Abi hussein¹,², O. Venard¹,², G. Baudoin¹,², ¹ESIEE Paris, Noisy-Le-Grand, France, ²Université Paris-Est ESYCOM, Champs-sur-Marne, France</td>
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<td><strong>EuMC09-05</strong>&lt;br&gt;Rapid Adjoint-Based Design Optimization of Compact Microwave Structures using Multi-Fidelity Simulation Models&lt;br&gt;S. Kozie³,², A. Beksasievicz³,², &quot;Reyjavik University, Reykjavik, Iceland, ³Gdansk University of Technology, Gdansk, Poland</td>
<td><strong>EuMC10-05</strong>&lt;br&gt;Characterizing Direct and Cross Memory in RF Nonlinear Systems using Simple Two Tone Measurements&lt;br&gt;F. M. Barradas, P. M. Lavrador, T. R. Cunha, France, ³University of Est-EYSOCUM, Champs-sur-Marne, France</td>
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09:00 – 09:20
Welcome Address
Opening of the European Radar Conference 2016
David Daniels, EuRAD 2016 Chair

09:20 – 10:40
Captor for Typhoon: Past Present and Future
Dr Paul Holbourn, Chief Technical Officer, Airborne & Space Division, Finmeccanica

The Captor radar for Typhoon has been the most significant European airborne radar programme ever in terms of value and numbers. Development of Captor-M, the mechanical scan variant formally started in 1990, and entered operational service in 2004. With the award of a major contract in 2014 to develop an Active Electronically Scanned Array (AESA) upgrade, it seemed an appropriate juncture to record the engineering achievement that Captor-M represents and describe its likely future evolution.

Although the inception of Captor-M dates back to 1985, its architecture, operation and waveform suite is entirely modern, and in many cases anticipates the on-going AESA upgrade. The system has incorporated significant hardware and software upgrades during its in-service life to ensure its combat effectiveness is maintained.

As the primary sensor within the Typhoon weapon system, much of the operational advantage that Typhoon enjoys derives from this radar. Participation in this highly successful programme has allowed Finmeccanica to develop as a business, and become the leading European supplier of airborne radar.
WEDNESDAY

Room 13
EuMC14 Bio-Sensors, Gas Detection and Microfluidics
Chair: Dominique Schreurs, KU Leuven
Co-Chair: Katia Grenier, LAAS

EuMC14-01 Coupled Dielectric-Split Ring Microwave Resonator for Liquid Measurements in Microfluidic Channels at Nanoliter Volumes
C. J. Watts, S. M. Hanham, M. M. Ahmad, M. Adabi, N. Klein, Imperial College London, London, United Kingdom

Room 14
EuMC15 Control Circuits
Chair: Julien Lintjungan, XILIM Limoges
Co-Chair: Michele Canuso, Infineon Technologies

EuMC15-01 An Ultra-Wideband Schottky Diode Based Envelope Detector for 2.5 Gbps Signals
B. Cimoli1, G. Silvio Valdecasa2,1, A. Bianco Granja1, J. Bervenese Jensen1, I. T. Monroy2, T. Johansen1, J. Vegas Olmos1, Danish Technical University, Kgs. Lyngby, Denmark

Room 15
EuMC16 Frequency Selective Surfaces and Metasurfaces
Chair: Alessandro Galli, Sapienza University of Rome
Co-Chair: Yang Hao, Queen Mary University of London

EuMC16-01 Resonant Blazed Metasurface Gratings
M. Memarian, X. Li, T. Ito, University of California, Los Angeles (UCLA), Los Angeles, United States

Room 17
EuMC17 Antenna Design
Chair: Matthias Hein, University of Ilmenau
Co-Chair: Marco Pasian, University of Pavia

EuMC17-01 Stub-Loaded Resonator-Fed Filtering Patch Antenna with Improved Bandwidth
C. Mao1, S. Gao1, Y. Wang1, University of Kent, Canterbury, United Kingdom

WEDNESDAY

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WEDNESDAY

Room 15

EuMC22
Advanced Antenna Technologies and Concepts
Chair: Danièle Vanhoenacker-Javier, Université Catholique de Louvain
Co-Chair: Giandomenico Amendola, University of Calabria

EuMC22-01
Terahertz Microstrip Elevated Stack Antenna Technology on GaN-on-Low Resistivity Silicon Substrates for TMIC
B. Benakaprasad1, A. Eblabla1, Y. U. I., T. Hayne2, D. Wallis1, J. Ganev1, C. Humphreys1, S. K. Elgaid1, University of Glasgow, Glasgow, United Kingdom, University of Cambridge, Cambridge, United Kingdom

EuMC22-02
SIW Based Modified Slotted Array Antenna with Circular Polarization for X- and Ku- and K-Band Communications
C. De, S. Pradhan1, K. S S, Indian Institute of Information Technology Design and Manufacturing Kancheepuram, Chennai, India

11:30 - 11:40

EuMC23-01
Scanning Properties of Novel Metasurface-Based Reflector Antennas
S. N. Topcickova1, V. S. Asacbchyy, S. A. Tseytalykov, Aalto University, Aalto, Finland

11:40 - 12:00

EuMC23-02
Performance of Radiation Pattern and Polarization Diversity for Body-Centric Applications at 2.45 GHz
R. Masood1, C. Person1, R. Sauleau1, University of Calabria, Université de Rennes 1, France

12:00 - 12:20

EuMC23-03
Broadband Bow-Tie Slot Antenna with Tuning Stub for Resonant Tunneling Diode Oscillators with Novel Configuration for Substrate Effects Suppression
K. H. Alharbi, A. Khalid, A. Olfare, J. Wang, E. Wasige, University of Glasgow, Glasgow, United Kingdom

EuMC23-04
Leakage Cancellation using Antenna Image Impedance for CW Radar Applications
V. Mitrovevi, M. Radosavanovic, B. Jokanovic, D. Ronc-Lubecke, V. M. Lubecke, University of Belgrade, Belgrade, Yugoslavia, University of Hawaii at Manoa, Honolulu, United States

12:20 - 12:40

EuMC23-05
Multi-Level ASK Spatial Modulators Operating a 100 GHz Lens-Array Antenna and 65 nm CMOS
N. Landsberg, E. Soche, Tel Aviv University, Tel Aviv, Israel

12:40 - 13:00

Room 17

EuMC23
Reconfigurable Antennas
Chair: Jozef Models, Warsaw University of Technology
Co-Chair: Ian Gresham, Anokiwave

11:20 - 11:40

Room 14

Industry Focused Panel Session
Solid-State and Vacuum PAs: Latest Industrial Trends and Future Direction
Organisers: Kamal K. Samanta, AMWT, UK, Allen Katz, Linearizer Technology/The College of New Jersey, USA

13:15 – 14:00

Recently, semiconductor technologies (GaN, LDMOS, SiC) have made enormous advancement in power, efficiency, linearity and bandwidth, which were unimaginable even a few years ago. As a result, SSPAs are starting to replace vacuum devices such as TWTAs, magnetrons and klystrons for high power industrial applications (100’s watts to kWs). Areas affected include space/satellite, defence, electromagnetic compatibility (EMC), communications and broadcast, medical imaging, and atomic reactors/accelerators. In response to this challenge, the vacuum technology industry has continued to advance with higher power and efficiency, wider bandwidths at ever higher operating frequencies.

A comprehensive technical discussion will follow short presentations from the panelists. Both vacuum and semiconductor technologies will be represented with speakers from leading device and application industries in Europe and USA.

The panel will review the state-of-the-art in industrial development made over recent years and the current status of high power SSPAs (LDMOS, GaAs & GaN) and vacuum PAs (covering RF to mm-W); the main application areas of commercially available products and systems, and the future trends and challenges. Most importantly, the panel will discuss the impact of SSPAs on the traditional realm of vacuum based devices.

Panelists:
  • Carter M. Armstrong, Vice President of Engineering L-3 Communications, USA. Title: Advances in RF Vacuum Electronics
  • Eric F. Nicol, Chief LWTA Engineer, Space Systems Loral (SSL), USA. Title: Competition between TWTs and SSPA’s Heats up as New Power Levels are Reached
  • Roger Williams, President Ampleon, USA. Title: LDMOS Technology Takes on the Industrial Magnetron
  • Ralph Green, Research and Development Manager, Airbus Defence and Space Limited, Portsmouth, UK. Title: Advanced Space Applications for SSPAs
  • Dean White, Product Line Director, Qorvo Semiconductor, USA. Title: How Solid State Technology will Revolutionize High Power RF Applications
  • Didier Floriot, Technology Manager, United Monolithic Semiconductor (UMS), France. Title: Status and Trends of GaN Elementar HPA’s for SSPA from L to Ku Bands
  • Kamal Samanta, AMWT Ltd, UK. Title: Advanced kW GaN SSPA Technologies for EMC, Defence & Aerospace
  • Allen Katz, President Linearizer Technology/The College of New Jersey. Title: New Developments in Linearization of GaN Power Amplifiers

14:15 – 14:45
EuMC Poster02 Session  
Chair: Rob Sloan, University of Manchester  
13:00 – 14:20  
The posters are on display from 13:00 – 14:20  
The authors are present for discussion from 13:00 – 14:20  

**Exhibition Hall**

**EuMC Poster02-01**
Microstrip Diplexers with Dual-Mode Patch Resonator Junctions  
E. Ogbozo, Y. W. Y. Wang, University of Greenwich, Chatham, United Kingdom

**EuMC Poster02-02**
Dual Band Filter with Quad-Mode Stripline Resonator  
M. Tamura, K. Ichinose, Toyohashi University of Technology, Toyohashi, Japan

**EuMC Poster02-03**
Microstrip Wideband Diplexer with Narrow Guard Band Based on All-Resonator Structures  
Y. Wu, Y. Wang, E. Ogbozo, University of Greenwich, Chatham, United Kingdom

**EuMC Poster02-04**
Multi-Coupled Resonator Microwave Diplexer with High Isolation  
A. O. Nwajiana, K. S. Yeo, University of East London, London, United Kingdom

**EuMC Poster02-05**
Balanced Bandpass Filter with Intrinsic Common Mode Suppression using Slot Coupled Lines and Microstrip Loading Lines  
Y. Huang, C. Lin, T. Wu, National Taiwan University, Taipei, Taiwan

**EuMC Poster02-06**
A Hybrid Model for Manifold Multiplexers without Sleeves  
X. Yin, J. Yang, S. Sun, China Academy of Space Technology (Xi’an), Xian, China

**EuMC Poster02-07**
New Complementary Split Ring Resonator Structure for Rectangular Waveguide BPF Design  
W. A. Amiola, I. Kim, Kyung Hee University, Yongin-si, Republic of Korea

**EuMC Poster02-08**
Ultra Broadband Non-Planar DC-67-100 GHz Contiguous Diplexer Implemented On Organic Liquid Crystal Polymer (LCP)  
I. Ashiq, A. Khanna, National Instruments, Santa Clara, United States

**EuMC Poster02-09**
X-, K- and Q-Band Matched Loads Based on Microwave Photonic Crystals  
D. A. Usanov1,2; A. V. Skripal3; D. V. Ponomarev; V. P. Meshcheryakov; N. F. Popova; M. K. Merdanov2, Saratov State University, Saratov, Russian Federation, 1 LLC Nika-Microwave, Saratov, Russian Federation, 2JSC SPN Electronic Engineering, Moscow, Russian Federation

**EuMC Poster02-10**
Design of Beam-Splitting Frequency Selective Surfaces for Fabry-Perot Cavity Antenna Systems  
C. Lee, R. Sainati, R. Franklin, University of Minnesota, Minneapolis, United States

**EuMC Poster02-11**
Electrically Tuneable Thin-Film Magnonic Crystals Based on a Slot Transmission Line  
A. A. Nikitin; A. A. Nikitin; A. B. Ustinov; A. A. Semenov; E. Lähderanta, 1St. Petersburg Electrotechnical University “LETI”, 2St. Petersburg, Russia, 3ITMO University, Peterburg, Russian Federation, 4Lappeenranta University of Technology, Lappeenranta, Finland

**EuMC Poster02-12**
Nonreciprocal Frequency Mixing in the Nonlinear PT-Symmetric Hyperbolic Metamaterials  
O. V. Shramkova, G. P. Tisonis, University of Crete, Heraklion, Greece

**EuMC Poster02-13**
An Optically Transparent Wideband High Impedance Surface  
M. M. Mostafa, M. I. Ibrahim, T. M. Abulfadl, A. M. Safwat, Faculty of Engineering, Ain Shams University, Cairo, Egypt, Faculty of Engineering, Cairo University, Cairo, Egypt

**EuMC Poster02-14**
Dual-Polarization Correlation R-Deck Radiometry System for Microwave Imaging of Heat Sources of Biological Tissues  
R. Park, B. Park, B. Batairamalai, C. Cheon, University of Seoul, Seoul, Republic of Korea

**EuMC Poster02-15**
Imaging of Exosomes by Broadband Scanning Microwave Microscopy  
X. Jin; J. C. Hwang; F. Piarcheva; M. Malavolta; A. Provincial; A. Di Donato; D. M. Carenelli; A. Morini; G. Venanzoni; Z. De Angelis; M. Farina; 1Lehigh University, Bethlehem, United States, 2INRCA, Ancona, Italy, 3Universita Politecnica delle Marche, Ancona, Italy

**EuMC Poster02-16**
Improved Field Homogeneity for Multi-Channel Binned Impedance Microstrip Transceiver Arrays and Travelling Wave for MRI at 7T  
L. Elayaed; D. Erri; T. Thebes Institute of Engineering, Cairo, Egypt, University of Duisburg-Essen, Duisburg, Germany

**EuMC Poster02-17**
A 70 MHz Double Waveguide Set-up for Hyperthermia of Deep Superficial Tumors  
H. P. Kok, A. Bakker, M. W. Kolff, 1University of Amsterdam, Amsterdam, Netherlands, 2Hillsboro, United States, 3RIKEN, Saitama, Japan, 4Center for Advanced Photonics, Kashiwa, Japan

**EuMC Poster02-18**
Improved Field Correlation Radiometry System for Microwave Photonic Matched Loads Based on Narrow X-, K- and Q-Band Bandpass Filter with High Isolation  
X. Jin; J. C. Hwang; F. Piarcheva; M. Malavolta; A. Provincial; A. Di Donato; D. M. Carenelli; A. Morini; G. Venanzoni; Z. De Angelis; M. Farina; 1Lehigh University, Bethlehem, United States, 2INRCA, Ancona, Italy, 3Universita Politecnica delle Marche, Ancona, Italy

**EuMC Poster02-19**
Design of Conformal Wideband Antennas for Capsule Endoscopy within a Body Tissue Environment  
J. Baerlocher, G. Cummins, M. P. Desmurges, Heirt-Hott-Watt University, Edinburgh, United Kingdom

**EuMC Poster02-20**
Tuneable 13C/1H Dual Channel Matching Circuit for Dynamic Nuclear Polarization System with Cross-Polarization  
O. Rybakova, S. Bowen, Z. Zhubenko, J. H. Ardenkjær-Larsen, Technical University of Denmark, Kgs.Lyngby, Denmark

**EuMC Poster02-21**
Dispersion Compensation through Varying Temporal Windows for Time Reversal Methods  
A. M. Abdeljabbar, M. E. Yavuz, F. Costen, R. Himeno, H. Yokota, 1The University of Manchester, Manchester, United Kingdom, 2Hilborn, United States, 3RIKEN, Saitama, Japan, 4Center for Advanced Photonics, RIKEN, Saitama, Japan

**EuMC Poster02-22**
Microwave Imaging for Delamination Detection in T-Joints of Wind Turbine Composite Blades  
Z. Li, A. Haigh, C. Souts, A. Gibson, R. Sloan, N. Karimian, University of Manchester, Manchester, United Kingdom

**EuMC Poster02-23**
Self-Calibrating Highly Integrated Radiometric Frequency Front-end for Parallel 1/4 DQPSK Decoding  
M. Woelfel; U. Bochtler; T. Eibert; C. Schmidt, 1Hochschule Aschaffenburg, Aschaffenburg, Germany, 2Technische Universität München, München, Germany, 3KaiTec GmbH, Hoesbach, Germany

**EuMC Poster02-24**
Comparative Study of WLAN Dual-Band Monopole Antennas Printed and Etched on Paper and PET Substrates  
D. Lo Hine Tong, A. Ayissi Manga, P. Minard, A. Delalat, 1Hochschule Aschaffenburg, Aschaffenburg, Germany, 2Centre Technique du Papier, Grenoble, France

**EuMC Poster02-25**
Slot-Ring Multiport Driven Antenna with Improved Airside Radiation for Terahertz Communications  
M. Kwaad, K. Allard, J. Wang, E. Wagle, University of Glasgow, Glasgow, United Kingdom
EuMC Poster02 Session
Chair: Rob Sloan, University of Manchester
13:00 – 14:20
The posters are on display from 13:00 – 14:20
The authors are present for discussion from 13:00 – 14:20
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<td><strong>EuMC25</strong></td>
<td><strong>EuMC26</strong></td>
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<tr>
<td>Advances in Planar Filters Design</td>
<td>Advances in Antenna and Radiation Electromagnetic Modelling</td>
<td>High Frequency Oscillators</td>
<td>Systems and Applications 2</td>
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<td>Chair: Jason Hong, Heriot Watt University</td>
<td>Chair: Maurizio Bozzi, University of Pavia</td>
<td>Chair: Cicero Vaucier, NXP</td>
<td>Chair: Richard Ranson, Radio System Design</td>
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<td>Co-Chair: Alia Absurajileh, Airbus Defence and Space</td>
<td>Co-Chair: Oksana Shramkova, University of Crete</td>
<td>Co-Chair: Andrea Suriani, Thales Alenia Space</td>
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**Wednesdays**

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<th>14:20 - 14:40</th>
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<tr>
<td>Novel Dual Open-Loop Ring Resonator for Compact Planar Filters</td>
<td>TEM Transmission Line Radiation Losses Analysis</td>
<td>A 315 GHz Reflection Type Push-Push Oscillator in InP-DHB Technology</td>
<td>Downlink Output Power Requirements with an Experimental-Based Indoor LOS/NLOS MIMO Channel Models at 10 GHz to Provide 10 Gbit/s</td>
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<td>R. Taddei1, G. Macchiarella2, 1CommScope, Agrate Brianza, Italy, 2Politecnico di Milano, Milano, Italy</td>
<td>R. Iancuconescu1, V. Vullin2, Shenker College of Engineering and Design, Ramat Gan, Israel, 1Ben-Gurion University of the Negev, Beer Sheva, Israel</td>
<td>M. Hossain, N. Weimann, V. Krozer, W. Heinrich, Ferdinand-Braun-Institut (FBH), Berlin, Germany</td>
<td>T. Tuovinen, N. Tenno, A. Plarsinsen, Centre for Wireless Communications, University of Oulu, Oulu, Finland</td>
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<td><strong>EuMC24-02</strong></td>
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<tr>
<td>Design of Compact Triple-Passband Bandpass Filter</td>
<td>Higher Order Finite Element Method Solver for the Analysis of Microwave Devices in Planar Technology</td>
<td>A Fundamental 229-240 GHz VCO with Integrated Dynamic Frequency Divider Chain</td>
<td>E-Band Transmitter with 29 dBm RF Power for Satellite Communication</td>
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<tr>
<td>L. Jian1, Y. W. Chen1, Z. J. Dai1, H. W. Wu1, X. Y. Chen1, S. C. Chiu1, Y. K. Su1, 1Kun Shan University, Taiwan, Taiwan, 2National Cheng Kung University, Tainan, Taiwan, 3Kun-Shan University, Tainan, Taiwan</td>
<td>D. Garcia-Donor1, A. Amor-Martín1, L. Garcia-Castillo1, S. Ting1, M. Salazar-Palma2, 1University of Macau, Taipa, Macau, 2University Carlos III of Madrid, Leganes, Spain</td>
<td>J. Al-Eryani1,2, H. Knapp2, J. Wursthorn2, 1University of Technology Bremen, Bremen, Germany, 2Thales, Brest, France</td>
<td>P. Harat1, A. Tessmann1, D. Schwantschke1, R. Henneberger1, I. Kalfass1, University of Stuttgart, Stuttgart, Germany, Braunschweig Institute for Applied Solid State Physics, Freiburg, Germany, Radio-meter Physics, Meckenheim, Germany</td>
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<td>Pseudo-Elliptic Bandpass Filter with Stepped Impedance Stubs</td>
<td>New Planar Microwave Devices and Antennas by Practical Surface-Wave Launching</td>
<td>Microwave Near-Field Sensor for the Contactless Detection of Material Fluctuations</td>
<td>Microwave Near-Field Sensor for the Contactless Detection of Material Fluctuations</td>
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<td>J. A. Maebere1, T. Bopape, University of Pretoria, Pretoria, South Africa</td>
<td>S. K. Podlich1, 2, S. F. Muhammed1, A. P. Freundorfer1, Y. M. Antar1, 1Heriot-Watt University, Edinburgh, United Kingdom, 3The Royal Military College of Canada, Kingston, United States, 1Cairo University, Cairo, Egypt, 2Queen's University, Kingston, Canada</td>
<td>B. Rattenhorst1, C. Bae1, C. Schutz1, L. Roffes1, J. Musch1, Ruhr-University Bochum, Bochum, Germany</td>
<td>B. Rattenhorst1, C. Bae1, C. Schutz1, L. Roffes1, J. Musch1, Ruhr-University Bochum, Bochum, Germany</td>
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<td>Design of the Fourth Order Dual-Mode Microstrip Filter by using Interdigital Capacitive Loading Element with High Selectivity</td>
<td>Near-Field Correlation Measurement and Evaluation of Stationary and Cyclostrophic Stochastic Electromagnetic Fields</td>
<td>A 100 GHz Fundamental Oscillator with 25% Efficiency Based on Transferred-Substrate InP-DHB Technology</td>
<td>A Multi-Channel Outphasing Ring Combiner for Mode Switching and MIMO</td>
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<tr>
<td>C. Karpuz1, P. Ozaktar Ozdemir1, Pamukkale University, Denizli, Turkey</td>
<td>J. A. Tisser1, M. Hader1, M. H. Bakradze1, C. Snellert1, S. Wane1, D. Bajon1, Y. Kuznetsov1, D. Thomas2, 1Technische Universität München, Munich, Germany, 2Infineon Technologies AG, Neuburg, Germany</td>
<td>M. Hossain, N. Weimann, V. Krozer, W. Heinrich, Ferdinand-Braun-Institut (FBH), Berlin, Germany</td>
<td>K. D. Holzer1, J. S. Walling1, 1University of Utah, Salt Lake City, United States, 2L3 Communications, Salt Lake City, United States</td>
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<td>Compact Multi-Section Resonator and Bandpass Filter Application</td>
<td>A Very Low Phase-Noise Ku-Band Resistively Coupled VCO Array in 0.25 µm SiGe:C BiCMOS</td>
<td>Microwave Nondestructive Evaluation of Thermal Barrier Coated Turbine Blades using Correlation Analysis</td>
<td>A Very Low Phase-Noise Ku-Band Resistively Coupled VCO Array in 0.25 µm SiGe:C BiCMOS</td>
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<tr>
<td>L. Theivathan1, J. B. Pottie1, C. Quendo1, R. Ségalens1, F. Mahié2, 1University of Brest, Brest, France, 2Thales, Brest, France</td>
<td>J. Hyvert1,2, D. Cordeau1, J. Paillot1, P. Philippe1, 1CNRS-XIM UMR 7252, Angouleme, France, 2NXP Semiconductors, Caen, France</td>
<td>L. Thépaut1,2, G. Macchiarella2, 1CommScope, Agrate Brianza, Italy, 2Politecnico di Milano, Milano, Italy</td>
<td>M. Abkar Jalaludin Khan1, R. Sloan1, C. I. Duff1, M. Wielgat2, J. F. Knowles3, 1University of Manchester, Manchester, United Kingdom, 2Alstom TRIM, Baden, Switzerland, 3K Nideck Consultancy Ltd, Warrington, United States</td>
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Hotel Booking Form 2016

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

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http://www.connexhotelsande­vents.com/eumw-2016-london.html

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: __________

Tel: +44 (0)7775 744193, FAX: +44 (0)2380 051113, Email: sally@connexhotelsande­vents.com
### Headquarters Hotel

**Altof London Excel**  
1 Eastern Gateway, Royal Victoria Dock, London E16 1FR  
- Located at the East entrance of Excel  

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<th>Double Occupancy</th>
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<tr>
<td><strong>LIMITED SPACE</strong></td>
<td><strong>Special event rate from £200.00 including Breakfast and VAT – only available via this booking form</strong></td>
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| Aloft London Excel | £200.00 | £210.00 |

### *** IBIS Styles London Excel***

272-283 Victoria Dock Road, London E16 3BY  
- Opposite Custom House Entrance  

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<th>Prepay Rates from</th>
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<td><strong>Special event rate from £179.00 including Breakfast and VAT – only available via this booking form</strong></td>
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| IBIS Styles London Excel | £255.00 | £265.00 |

### *** Holiday Inn Express London Excel***

1018 Dockside Road, London E16  
- 8 minute walk to Excel  

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<th>Prepay Rates from</th>
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<td><strong>Special event rate from £149.00 including Breakfast and VAT – only available via this booking form</strong></td>
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| Holiday Inn Express London Excel | £176.00 | £194.00 |

### *** Novotel London Excel***

7 Western Gateway, London E16 1AA  
- Located at the West entrance of Excel  

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| Novotel London Excel | £244.00 | £260.00 |

### *** Crowne Plaza London Docklands***

Western Gateway, Royal Victoria Dock, London E16 1AL  
- Located at the West entrance of Excel  

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| Crowne Plaza London Docklands | £286.00 |

### *** Doubletree by Hilton Excel***

2 Festoon Way, Royal Victoria Dock, London E16 1RH  
- Located at the East entrance of Excel  

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| Doubletree by Hilton Excel | £280.00 |

### *** Sunborn Yacht Floating Hotel***

Western Gateway, Royal Victoria Dock, London E16 1XL  
- Located at the West entrance of Excel  

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| Sunborn Yacht Floating Hotel | £260.00 | £305.00 |

### *** IBIS London Excel Docklands***

9 Western Gateway, London E16 1AB  
- Located at the West entrance of Excel  

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| IBIS London Excel Docklands | £199.00 | £219.00 |

### **Travelodge London Excel**

1016 Dockside Road, London E16 8DA  
- Located at the East entrance of Excel  

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| Travelodge London Excel | £86.00 |

### **Travelodge London City Airport**

1 Connaught Road E16 2DB  
- 10 minute walk to Excel  

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| Travelodge London City Airport | £75.00 |

### **Ibis Budget London City Airport**

North Woolwich Road, Silvertown, London E16 2EE  
- 10 minute walk to Excel  

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| Ibis Budget London City Airport | £54.50 | £60.00 |

### **Travelodge London Docklands**

A13 Coriander Avenue Off East India Dock Road, London  
- 15 minutes by DLR to Excel  

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| Travelodge London Docklands | £156.00 | £160.00 |

### Canary Wharf / London City Area

- 20-25 minutes by DLR to Excel - Hotels available from £160.00

### Limehouse to Whitechapel area

- 25 minutes by DLR to Excel – Hotels available from £115.00

### Stratford / Olympic Village Area

- 25-30 minutes by DLR to Excel – Hotels available from £91.00

### Tower Bridge / London Bridge Area

- 25-35 minutes by DLR to Excel – Hotels available from £152.00

### Greenwich / Cutty Sark area

- 20 minutes by Emirates Cable Car – Hotels available from £70.00
**Room 4**

**EuMC28**
Diplexers and Reconfigurable Filters  
Chair: Serge Verdyeme, University of Limoges  
Co-Chair: Giuseppe Macchiarella, Politecnico di Milano

**EuMC29**
Measurement Systems  
Chair: Denis Barraud, XILUM  
Co-Chair: Yumi Lasri, Institut d'Electronique de Microélectronique et de Nanotechnologie

**EuMC30**
High Frequency and Wideband Amplifiers  
Chair: Matthias Rudolph, Brandenburg University of Technology  
Co-Chair: Shokrollah Karimian, CERN

**Room 13**

**EuMC28-01**
Novel RF Interference Rejection Technique using a Four-Port Diplexer  
J. Kompong, M. Sandhu, N. Somji, J. Hunter, University of Leeds, Leeds, United Kingdom

**EuMC29-01**
Spatial Resolution Enhancement of Near Field Microwave Microscope  
S. Gui, T. Lin, I. Lasri, EMN-University Lille I, Villeneuve d’Ascq, France

**EuMC30-01**
GaN-Based E-Band Power Amplifier Modules  
D. Schwantschke1, R. Henningsen2, S. Wagner3, A. Tessmann1, J. Kalffares4, P. Brückner3, R. Quay2, O. Ambache1

1Fraunhofer Institute for Applied Solid-State Physics, Freiburg, Germany  
2Radiometer Physics GmbH, Meckenheim, Germany  
3University of Stuttgart, Stuttgart, Germany

**Room 14**

**EuMC28-02**
A 2-18 GHz Compact Microwave Band-Pass Filter Suitable for Planar and Three-Dimension Flexible Integration  
Y. Lan, Y. Xu, T. Mei, Y. Wu, R. Xia, School of Electronic Engineering, UESTC, Chengdu, China

**EuMC29-02**
Multi-Probe Near-Field Measurement of Stochastic Noisy Radiations: Perspectives for Chip-Packaging LNA-Probe Co-Design  
S. Wan1, D. Bajer1, D. Lesenechal1, J. Russe1, D. Thomas1, P. Russe1

1INESC TEC, University of Porto, Portugal  
2National Institute of Advanced Industrial Science and Technology, Japan

**EuMC30-02**
60% PAE, 30 W X-Band and 33% PAE, 100 W Ku-Band PAs Utilizing 0.15 um GaN HEMT Technology  
T. Tanii1, T. Morimoto1, T. Morimoto2, T. Morimoto3, A. Inoue1, A. Ota1, H. Katsuragawa1, T. Yanour2, K. Yamasaki1, H. Futamoto

1Mitsubishi Electric Corporation, Itami, Japan  
2Mitsubishi Electric Corporation, Amagasaki, Japan  
3Mitsubishi Electric Corporation, Koja, Japan

**Room 15**

**EuMC28-03**
Reconfigurable Doublet Dual-Mode Cavity Filter Designs Providing Remote Controlled Center Frequency and Bandwidth Re-Allocation  
U. Rosenberg1, R. Beyer1, P. Krauß1, T. Sieverding1, P. M. Iglesias2, C. Ernst3

1National Institute of Advanced Industrial Science and Technology, Japan  
2Micron Global Engineering GbR, Bremen, Germany  
3University of Stuttgart, Stuttgart, Germany

**EuMC29-03**
Probe Influence on Integrated Antenna Measurements at Frequencies Above 100 GHz  
L. Boehm, M. Hitzer, F. Roos, C. Waldschmidt, Ulm University, Ulm, Germany

**EuMC30-03**
A 77 W, 51% GaN HEMT Doherty Power Amplifier for 3.5 GHz Band LTE Base Stations  

**EuMC31**
Metamaterial Absorbers

- **Room 14**
  - **EuMC31-01** Design and Analysis of a Broadband Single Layer Circuit Analog Absorber  
  S. Ghosh, S. Bhattacharyya, K. V. S. Srinivasa, Indian Institute of Technology Kanpur, Kanpur, India
  - **EuMC31-02** Design of Frequency-Dispersive Magnetic Material for Application of Microwave Absorption  
  T. Deng, Z. Chen, National University of Singapore, Singapore

- **Room 15**
  - **EuMC31-03** Suppression of Radar Cross Section Based on Polarization-Independent Metamaterial Absorber  
  A. Cier1, B. Cier2, F. Zou1, R. Nair1, O. M. Yucedag2, H. Koc2, Turkish Military Academy, Ankara, Turkey  
  1Turkish Military Academy, Ankara, Turkey  
  2TOBB University of Economics and Technology, Ankara, Turkey  
  3The Scientific and Technological Research Council of Turkey, Ankara, Turkey

**Session: Wednesday**

**Room 4**

- **EuMC28-01** Novel RF Interference Rejection Technique using a Four-Port Diplexer  
- **EuMC29-01** Spatial Resolution Enhancement of Near Field Microwave Microscope  
- **EuMC30-01** GaN-Based E-Band Power Amplifier Modules

**Room 13**

- **EuMC28-02** A 2-18 GHz Compact Microwave Band-Pass Filter Suitable for Planar and Three-Dimension Flexible Integration  
- **EuMC29-02** Multi-Probe Near-Field Measurement of Stochastic Noisy Radiations: Perspectives for Chip-Packaging LNA-Probe Co-Design

**Room 14**

- **EuMC28-03** Reconfigurable Doublet Dual-Mode Cavity Filter Designs Providing Remote Controlled Center Frequency and Bandwidth Re-Allocation  
- **EuMC29-03** Probe Influence on Integrated Antenna Measurements at Frequencies Above 100 GHz

**Room 15**

- **EuMC31-01** Design and Analysis of a Broadband Single Layer Circuit Analog Absorber  
- **EuMC31-02** Design of Frequency-Dispersive Magnetic Material for Application of Microwave Absorption
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**EuRAD/EuMC01**
Novel Radar Front-End Concepts  
Chair: Alexander Köpfn, FAU Erlangen  
Co-Chair: Alessio Balleri, Cranfield University

**EuRAD/EuMC02**
Terahertz Radar, Sensing and Imaging  
Chair: Marina Gashirina, University of Birmingham  
Co-Chair: Peter Gardner, University of Birmingham

**EuRAD02**
Radar Performance in Complex Environments  
Chair: Mateo Burgos Garcia, Polytechnic University of Madrid  
Co-Chair: Laith Danoon, Manchester University

**EuMC32**
Advances in RFID Systems  
Chair: Lutfi Albasha, American University of Sharjah  
Co-Chair: Józef Modelski, Warsaw University of Technology

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**EuRAD/EuMC01-01**
Digital True Time Delay for Pulse Correlation Radars  
M. Schauer1, W. Mayer2, C. Walschoml3, Endress+Ettex GmbH+Co. KG, Maulburg, Germany  
1Endress+Hauser GmbH+Co. KG, Maulburg, Germany

**EuRAD/EuMC02-01**
Predicted Sensitivity of a 300 GHz FMCW Radar to Pedestrians  
A. Stoev, M. Gashirina, E. Hoare, University of Birmingham, Birmingham, United Kingdom

**EuRAD02-01**
Quantifying Cross Modulation Effects from Pulsed Interferers on Radar Signals  
C. Fischer, W. Gruener, Airbus DS Border Security and Electronics GmbH, Ulm, Germany

**EuMC32-01**
Multimode Stepped Impedance Resonators and Circuit Applications in Chipless RFID Tags  
F. Sakai1, M. Makimoto2, K. Wada3, Sakura Tech Corporation, Kawasaki, Japan,  
1The University of Electro-Communications, Chofu, Japan

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**EuRAD/EuMC01-02**
Broadband Multifunction AESA Front-Ends: New Requirements and Emerging Technologies  
W. D. Gautier, W. Gruener, R. Rieger, S. Chartier, Airbus DS Electronics and Border Security, Ulm, Germany

**EuRAD/EuMC02-02**
Design and Implementation of Spaceborne Terahertz Cloud Radar  
M. Bia1, X. Dong2, A. Guo1, Z. Lu1, K. Cui3, S. Wang4, China Academy of Space Technology, Beijing, China,  
1Beijing Institute of Technology, Beijing, China

**EuRAD02-02**
Analytical Investigation of Diffraction at Multiple Blades of Wind Turbine Rotor  
T. Pickenschier1, M. B. Raza2, Helmut Schmidt University, Hamburg, Germany,  
1Griffith University, Brisbane, Australia

**EuMC32-02**
Near-Field Measurement of Connected Smart RFIC Objects Accounting for Environmental Uncertainties  
S. Wöhr1, D. Bayer2, D. Lesenechal3, J. Rau4, P. Rau5, D. Thomas2, G. Tenner2, G. Gradov2, V. Kuznetsov2,  
1Nes-Semiconductor France, Colombelles, France,  
2University Federale de Lille, Lille, France,  
3Lum, Munich, Germany,  
4University of Nottingham, Nottingham, United Kingdom,  
5Moscow Aviation Institute, Moscow, Russian Federation

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**EuRAD/EuMC01-03**
Single-Bit Architectures for Radar-on-Chip  
O. Bjørndal1, S. E. Hamran1, T. S. Lande1, Norwegian Defence Research Establishment (FFI), Kjeller, Norway,  
1University of Oslo, Oslo, Norway

**EuRAD/EuMC02-03**
Millimetre Resolution SAR Imaging of Infrastructure in the Lower THz Region using MIRANDA-300  
S. Stanko, S. Palm, R. Sommer, F. Klöppel, M. Caris, N. Pohl, Fraunhofer FHR, Wachtberg, Germany

**EuRAD02-03**
EM Modelling of Radar Signatures of Targets Behind Wind Farms – A Time-Gating Ray Tracing Approach  
F. Weinmann, Fraunhofer FHR, Wachtberg, Germany

**EuMC32-03**
RF-Powered Multi-Sensing Platform for RFID with Frequency Modulation  
M. Ismail1, J. Song2, V. Vukan1, J. Nikunen2,  
1Aalto University, Espoo, Finland,  
2Metso Automation, Tampere, Finland

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**EuRAD/EuMC01-04**
A CMOS UWB Radar Sensor for High Speed Moving Objects  
S. Jung1, S. Kim2, W. Choi3, J. Jeon2, J. Kim3, Y. Eo4, H. Park5, H. Kim3, Silicon R&D, Seongnam, Republic of Korea,  
1Kwangwoon University, Nowon, Republic of Korea,  
2Seongnam, Republic of Korea,  
3Lignex,  
4Kwangwoon University, Chofu, Japan,  
5Moscow University of Physics and Technology (MSTU), Moscow, Russian Federation

**EuRAD/EuMC02-04**
Measurement Setup for Characterization of a Bistatic Radar Sensor for Monitoring Particulate Matter  
A. Reinhardt, A. Telyakov, M. Hoesf, Institute of Electrical Engineering and Information Technology, Kiel University, Kiel, Germany

**EuRAD02-04**
Simulating Complex Environments for Millimeter-Wave Sensors  
N. Douchin, J. Latger, I. Cathala, R. Marechal, OIKOS Synthetic Environment, Vigoüet-Auzi, France

**EuMC32-04**
Electromagnetic Characterization of Soil Moisture and Salinity for UHF RFID Applications in Precision Agriculture  
S. Day1, R. Bhattacharyya2, N. C. Karmakar2,  
1Monash University, Clayton, Australia,  
2Massachusetts Institute of Technology (MIT), Cambridge, United States

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**EuRAD/EuMC01-05**
A Polarimetric 76-79 GHz Radar-Frontend for Target Classification in Automotive Use  
S. Trummen1, G. E. Hamberger1, U. Siar6, T. E. Ebert6,  
1ASTYX GmbH - Communication & Sensors, Ottobrunn, Germany,  
2Technical University of Munich, Munich, Germany

**EuRAD/EuMC02-05**
High Resolution Millimetre-Wave Inverse Synthetic Aperture Radar Demonstrator for Security Applications  
P. Dzvonkowksi, P. Samczynski, K. Kulpa, Warsaw University of Technology, Warsaw, Poland

**EuRAD02-05**
Realtime Generation of K-Distributed Sea Clutter for Hardware-in-the-Loop Radar Evaluation  
J. R. van der Merwe, J. J. Strydom, J. E. Cilliers, Council for Scientific and Industrial Research (CSIR), Pretoria, South Africa

**EuMC32-05**
Semi-Active 866 MHz RFID Implantable Tag Fed by 6.78 MHz Inductive Wireless Power Transfer  
J. Kracek, M. Svanda, M. Mazanek, J. Machac, Czech Technical University in Prague, Prague, Czech Republic
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<td><strong>EuMC34</strong>&lt;br&gt;Tunable and Reconfigurable Circuits and Structures&lt;br&gt;Chair: Jose I. Alonso, Technical University of Madrid&lt;br&gt;Co-Chair: Mehmet Karaeslan, e2V Technologies</td>
<td><strong>EuRAD03</strong>&lt;br&gt;MIMO Radar&lt;br&gt;Chair: Chris Baker, Avellant&lt;br&gt;Co-Chair: Jacob de Wit, TNO</td>
<td><strong>EuMC35</strong>&lt;br&gt;Biomedical Imaging&lt;br&gt;Chair: Nutapong Somjit, University of Leeds&lt;br&gt;Co-Chair: Bart Nauwelaers, KU Leuven</td>
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### EuMC33 - Passive Components for High Power Applications
- **EuMC33-01**<br>A Fully-Printed MIM Varactor for High Power Application<br>Authors: D. Kiememund, A. Heubner, T. Fieker, M. Abrecht, A. Wiens, W. Bigler, J. Binder, H. Maune, J. Jakoby

### EuMC34 - Tunable and Reconfigurable Circuits and Structures
- **EuMC34-01**<br>Design of Electronically Tunable Lumped-Element Bandpass Filters with Constant Bandwidths<br>Authors: A. Baskakova, V. Turgaliev, D. Khodobyak, St. Petersburg Electrotechnical University "LETI", St. Petersburg, Russian Federation
- **EuMC34-02**<br>Design of Tuneable Microstrip Dual-Mode Bandpass Filter with Reconfigurable Filtering Characteristics for Mobile Applications<br>Authors: C. Karpu, A. Gomez, A. Baranaas Fie, R. Takahashi, D. Hidaka, N. Kus, I. Kus, H. Kus, H. Kus, H. Kus

### EuRAD03 - MIMO Radar
- **EuRAD03-01**<br>Real-Time 2D+ velocity Localization Measurement of a Simultaneous Transmit OFDM MIMO Radar using Software Defined Radios<br>Authors: S. Sit, B. Nuss, M. Basak, W. Wiesbeck, T. Zwick, Karlsruhe Institute of Technology, Karlsruhe, Germany
- **EuRAD03-02**<br>On Some Important Features of MIMO Radars with Sparse Antenna Arrays<br>Authors: V. Chernyak, Moscow Aviation Institute (National Technical University), Moscow, Russian Federation

### EuMC35 - Biomedical Imaging
- **EuMC35-01**<br>Microwave Mammography with a Small Sensor and a Commercial Electromagnetic Simulator<br>Authors: Y. Kuwahara, Shizuoka University, Hamamatsu, Japan
- **EuMC35-02**<br>Breast Cancer Imaging at Millimetre-Waves: Feasibility Study on the Safety Exposure Limits<br>Authors: P. E. Espin-Lopez, A. Martellosio, M. Pasian, M. Bozzi, L. Pernegi, A. Mazzanti, E. Svelto, M. Bellini, G. Bittini, M. Renne, P. E. Summer, University of Pavia, Pavia, Italy, University of Milano, Milano, Italy, University of Paris, Paris, France, IEO European Institute of Oncology, Milano, Italy

### Other Sessions
- **EuMC35-03**<br>Polynomial Model for High-Order and Multi-Carrier Passive Intermodulation Products<br>Authors: D. Kozlov, A. Shrivok, A. Schuchinsky, Queen's University Belfast, Belfast, United Kingdom
- **EuMC35-04**<br>Modeling of Transmission Lines with Multiple Coated Conductors<br>Authors: G. Gold, K. Helmeich, Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany
- **EuMC35-05**<br>Experimental Study in Ku-Band of the Propagation Inside Empty Substrate Integrated Waveguides<br>Authors: A. Rekeng, M. Fernandez, J.A. Ballesteros, H. Esteban, V. E. Boia, University of Castilla-La Mancha, Cuenc, Spain, Polytechnic University of Valencia, Valencia, Spain

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## THURSDAY

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<td><strong>EuMC37</strong>&lt;br&gt;Stochastic Methods for Complex EMC Systems&lt;br&gt;Chair: Vahid Mariani Primiani, Università Politecnica delle Marche&lt;br&gt;Co-Chair: Gabriele Gradoni, University of Nottingham</td>
<td><strong>EuMC38</strong>&lt;br&gt;Antenna Technology&lt;br&gt;Chair: Ioan Lager, Delft University of Technology&lt;br&gt;Co-Chair: Dirk Heberling, RWTH Aachen</td>
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<td><strong>EuMC36-01</strong>&lt;br&gt;A 122 GHz System-in-Package Radar Sensor with BPSK Modulator in a 130 nm SiGe BiCMOS Technology&lt;br&gt;M. Furqan1, F. Ahmed1, R. Feger2, K. Aufinger1, A. Stelzer1, Johannes Kepler University, Linz, Austria, 1Infineon Technologies AG, Munich, Germany</td>
<td><strong>EuMC37-01</strong>&lt;br&gt;Parametric Analysis of Load Variation in WPT Systems Applied to AIMDs&lt;br&gt;M. Falsiani, S. Crusiano, T. Campi, University of L’Aquila, L’Aquila, Italy</td>
<td><strong>EuMC38-01</strong>&lt;br&gt;Chip-Mounted Dielectric Resonator Antenna with Alignment and Testing Features&lt;br&gt;D. López Cuencas, G. Alavi1, J. Hesselbarth1, 1Universität Stuttgart, Stuttgart, Germany, 2Institut für Mikroelektronik, Stuttgart, Germany</td>
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<td><strong>EuMC36-02</strong>&lt;br&gt;A Broadband, Compact 140-170 GHz Double Sideband Receiver in 90nm SiGe Technology&lt;br&gt;D. Lal, M. Abbas1, D. S. Ricketts, North Carolina State University, Raleigh, United States</td>
<td><strong>EuMC37-02</strong>&lt;br&gt;Time Domain Measurement of Near Field Emissions from Complex PCBs&lt;br&gt;D. W. Thomas, C. Smartt, S. Greedy, H. Nasseri, M. Baharuddin, G. Gradoni, G. Tanner, S. Creagh, University of Nottingham, Nottingham, United Kingdom</td>
<td><strong>EuMC38-02</strong>&lt;br&gt;Hybrid Metal-Plasma Yagi-Uda Antenna for Microwave Applications&lt;br&gt;G. Mansutti1, D. Melazzi2, A. Capobianco1, 1University of Padova, Padova, Italy, 2CISAS Padova, Padova, Italy</td>
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<td><strong>EuMC36-03</strong>&lt;br&gt;GaN SPST MMIC Switches Based on HPF/LPF Switching Concept for High Power Applications&lt;br&gt;H. Mizutani1, R. Ibiwara1, K. Honjo2, 1Salesian Polytechnic, Tokyo, Japan, 2The University of Electro-Communications, Tokyo, Japan</td>
<td><strong>EuMC37-03</strong>&lt;br&gt;Random Coupling Model for the Radiation of Statistical Sources inside Cavities&lt;br&gt;G. Gradoni1, T. Antonson1, E. Ott1, S. Anlage1, 1University of Nottingham, Nottingham, United Kingdom, 2University of Maryland, College Park, United States</td>
<td><strong>EuMC38-03</strong>&lt;br&gt;Antenna Coupling and Self-Interference Cancellation Bandwidth in SAW-less Diversity Receivers&lt;br&gt;D. Montanari, L. Silvestri, M. Bozzi, D. Manstretta, University of Pavia, Pavia, Italy</td>
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<td><strong>EuMC36-05</strong>&lt;br&gt;A Compensated Dual-Band SPDT Switch for Radar Duplexers at S- and X-Band&lt;br&gt;N. Hansen, C. Rave, B. Riehrdantz, A. F. Jacob, Techn. Univ. Hamburg-Harburg, Hamburg, Germany</td>
<td><strong>EuMC37-05</strong>&lt;br&gt;Optimization of 4G Wireless Access Network Features by using Reverberation Chambers: Application to High-Speed Train LTE Users&lt;br&gt;D. Michaeli1, M. Baraon1, R. Diamant1, L. Bastianelli1, F. Mogile2, V. M. Primiani2, Italia Solutions and Networks Italia, Rome, Italy, 1Telecom Italia, Rome, Italy, 2Telecom Italia, Ancona, Italy, 3Università Politecnica delle Marche, Ancona, United States</td>
<td><strong>EuMC38-05</strong>&lt;br&gt;24 GHz Dielectric-Filled Waveguide Fed Horn Antenna using 3D-LS-MID Technology&lt;br&gt;A. Fischer1, B. Geck1, M. Fengler1, A. Fischer1, 1Leibniz Universität Hannover, Hannover, Germany, 2LPKF Laser &amp; Electronics AG, Garbsen, Germany</td>
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**EuMC36-01**

A 122 GHz System-in-Package Radar Sensor with BPSK Modulator in a 130 nm SiGe BiCMOS Technology

M. Furqan1, F. Ahmed1, R. Feger2, K. Aufinger1, A. Stelzer1, Johannes Kepler University, Linz, Austria, 1Infineon Technologies AG, Munich, Germany

**EuMC37-01**

Parametric Analysis of Load Variation in WPT Systems Applied to AIMDs

M. Falsiani, S. Crusiano, T. Campi, University of L’Aquila, L’Aquila, Italy

**EuMC38-01**

Chip-Mounted Dielectric Resonator Antenna with Alignment and Testing Features

D. López Cuencas, G. Alavi1, J. Hesselbarth1, 1Universität Stuttgart, Stuttgart, Germany, 2Institut für Mikroelektronik, Stuttgart, Germany

**EuMC36-02**

A Broadband, Compact 140-170 GHz Double Sideband Receiver in 90nm SiGe Technology

D. Lal, M. Abbas1, D. S. Ricketts, North Carolina State University, Raleigh, United States

**EuMC37-02**

Time Domain Measurement of Near Field Emissions from Complex PCBs

D. W. Thomas, C. Smartt, S. Greedy, H. Nasseri, M. Baharuddin, G. Gradoni, G. Tanner, S. Creagh, University of Nottingham, Nottingham, United Kingdom

**EuMC38-02**

Hybrid Metal-Plasma Yagi-Uda Antenna for Microwave Applications

G. Mansutti1, D. Melazzi2, A. Capobianco1, 1University of Padova, Padova, Italy, 2CISAS Padova, Padova, Italy

**EuMC36-03**

GaN SPST MMIC Switches Based on HPF/LPF Switching Concept for High Power Applications

H. Mizutani1, R. Ibiwara1, K. Honjo2, 1Salesian Polytechnic, Tokyo, Japan, 2The University of Electro-Communications, Tokyo, Japan

**EuMC37-03**

Random Coupling Model for the Radiation of Statistical Sources inside Cavities

G. Gradoni1, T. Antonson1, E. Ott1, S. Anlage1, 1University of Nottingham, Nottingham, United Kingdom, 2University of Maryland, College Park, United States

**EuMC38-03**

Antenna Coupling and Self-Interference Cancellation Bandwidth in SAW-less Diversity Receivers

D. Montanari, L. Silvestri, M. Bozzi, D. Manstretta, University of Pavia, Pavia, Italy

**EuMC36-04**

Wideband and High Isolation RF Carrier-Aggregated Switch Module for LTE-Advanced Base Station

J. Li, W. Chang, Yuan Ze University, Taoyuan, Taiwan

**EuMC37-04**

Antenna Efficiency Measurement from Quality Factor Estimation in Reverberation Chamber


**EuMC38-04**

Pattern Reconfigurable Antenna at 2.45 GHz for WSN and WBAN Applications

A. Ramachandran, N. Timmons, J. Morrison, Letterkenney Institute of Technology, Letterkenney, Ireland

**EuMC36-05**

A Compensated Dual-Band SPDT Switch for Radar Duplexers at S- and X-Band

N. Hansen, C. Rave, B. Riehrdantz, A. F. Jacob, Techn. Univ. Hamburg-Harburg, Hamburg, Germany

**EuMC37-05**


D. Michaeli1, M. Baran1, R. Diamant1, L. Bastianelli1, F. Mogile2, V. M. Primiani2, Italia Solutions and Networks Italia, Rome, Italy, 1Telecom Italia, Rome, Italy, 2Telecom Italia, Ancona, Italy, 3Università Politecnica delle Marche, Ancona, United States

**EuMC38-05**

24 GHz Dielectric-Filled Waveguide Fed Horn Antenna using 3D-LS-MID Technology

A. Fischer1, B. Geck1, M. Fengler1, A. Fischer1, 1Leibniz Universität Hannover, Hannover, Germany, 2LPKF Laser & Electronics AG, Garbsen, Germany
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<td>D. Masotti1, A. Costanzo2, 1University of Bologna, Bologna, Italy, 2University of Bologna, Cesena, Italy</td>
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<td>1Fraunhofer Institute for Applied Solid State Physics, Freiburg, Germany, 2Karlsruhe Institute of Technology, Karlsruhe, Germany</td>
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<td>G. Hakobyan1, B. Yang2, Robert Bosch GmbH, Stuttgart, Germany, University of Stuttgart, Stuttgart, Germany</td>
<td>S. A. Sin, S. Bicakci, Balikesir University, Balikesir Merkez, Turkey</td>
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<td>A. Frischer1, J. Hasch1, D. Jetty1, M. Gema1, M. Goner1, C. Waldschmidt1, Robert Bosch GmbH, Stuttgart, Germany, 1Ulma University, Ulm, Germany</td>
<td>P. Kapitanova, M. Song, P. Belov, ITMO University, Saint-Petersburg, Russian Federation</td>
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<td><strong>Design of a Center-feed Waveguide Feeder for Wideband Rectangular Parallel-Plate Slot-Array Antenna On-Board Space-Borne X-band SAR System</strong></td>
<td><strong>Airborne Radar Network Coverage for Maritime Surveillance</strong></td>
<td><strong>Design of Free-Positioning Wireless Power Charging System for AAA Rechargeable Battery</strong></td>
</tr>
<tr>
<td>B. Pyne1, P. Akbar1, H. Saito1, M. Zhang1, H. Hidaka1, M. Aris1, University of Tokyo, Tokyo, Japan, Japan Aerospace Exploration Agency, Sagamihara, Japan, 1Tokyo Institute of Technology, Tokyo, Japan</td>
<td>H. Shervani, H. Griffiths, University College London, London, United Kingdom</td>
<td>T. Yeo1, D. Kim1, S. Oh1, S. Khang1, J. Yu1, Korea Advanced Institute of Technology, Daejeon, Republic of Korea, 2Seoul National University, Seoul, Republic of Korea</td>
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**THURSDAY**

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<tr>
<th>Time</th>
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<tr>
<td>10:20 - 10:40</td>
<td>EuRAD/EuMC03-01</td>
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<td>10:40 - 11:00</td>
<td>EuRAD04-01</td>
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<td>11:00 - 11:20</td>
<td>EuMC39-01</td>
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<td>11:20 - 11:40</td>
<td>EuRAD/EuMC03-02</td>
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<td>11:40 - 12:00</td>
<td>EuRAD04-02</td>
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<tr>
<td>12:00 - 12:20</td>
<td>EuMC39-02</td>
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<td>12:20 - 12:40</td>
<td>EuRAD/EuMC03-03</td>
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<td>12:40 - 13:00</td>
<td>EuRAD04-03</td>
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<tr>
<td>13:00 - 13:20</td>
<td>EuMC39-03</td>
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<tr>
<td>13:20 - 13:40</td>
<td>EuRAD/EuMC03-04</td>
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<td>EuRAD04-04</td>
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<td>14:00 - 14:20</td>
<td>EuMC39-04</td>
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<tr>
<td>11:20 - 11:40</td>
<td><strong>EuMC40</strong> Compact Implementation of Filters and Diplexers</td>
<td><strong>EuMC41</strong> Techniques and Microwave Devices for Controlling Surface Waves</td>
<td><strong>EuRAD05</strong> Synthetic Aperture Radar</td>
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<tr>
<td></td>
<td>Chair: Vicente Boria, Universidad Politécnica de Valencia</td>
<td>Chair: Symon Podlach, Heriot Watt University</td>
<td>Chair: Darren Coe, QinetiQ</td>
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<td>Co-Chair: Roberto Gomez, Universidad de Alcalá</td>
<td>Co-Chair: George Gousetis, Heriot Watt University</td>
<td>Co-Chair: Malcolm Stevens, Thales UK</td>
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<tr>
<td>11:40 - 12:00</td>
<td><strong>EuMC40-01</strong> A Novel Dielectric-Loaded Dual-Mode Cavity for Cellular Base Station Applications</td>
<td><strong>EuMC41-01</strong> The Role of Surface Waves in Design of Planar Leaky Wave Antennas</td>
<td><strong>EuRAD05-01</strong> Signature Predictions of Surface Targets Undergoing Turning Maneuvers in Squinted SAR</td>
</tr>
<tr>
<td></td>
<td>M. S. Bakr1,2, I. C. Hunter1, S. W. Luhaib1,</td>
<td>S. F. Mahmoud1, S. K. Podlach1,2, A. P. Freundorf2, Y. M. Antar1,</td>
<td>D. A. Garren, Naval Postgraduate School, Monterey, United States</td>
</tr>
<tr>
<td></td>
<td>University of Leeds, Leeds, United Kingdom, University of Technology, Baghdad, Iraq</td>
<td>University of Ghiza, Egypt, Heriot-Watt University, Edinburgh, United Kingdom, The Royal Military College, Kingston, Canada, Queen’s University, Kingston, Canada</td>
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<tr>
<td>12:00 - 12:20</td>
<td><strong>EuMC40-02</strong> Transmission Zero Realization in E-Plane Filters by Means of I/O Resonator Tapping</td>
<td><strong>EuMC41-02</strong> Controlling Surface Waves with Metasurfaces: from Planar Propagation to Conformal Cloaking</td>
<td><strong>EuRAD05-02</strong> Approximately Optimum GMTI Processing for Multichannel SAR using Ambiguity Function</td>
</tr>
<tr>
<td></td>
<td>G. Gousetis1, E. Doumanis2, J. Huaruinainen3,</td>
<td>L. Matekovits1, G. Labate1, Politecnico di Torino, Torino, Italy,</td>
<td>W. Zhang, Y. Fu, L. Nie, G. Zhao, National University of Defense Technology, Changsha, China</td>
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<td>Heriot-Watt University, Edinburgh, United Kingdom,</td>
<td>Macquarie University, Sydney, Australia</td>
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<td>University Kingdom, Alcala de Henares, Spain</td>
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<tr>
<td>12:20 - 12:40</td>
<td><strong>EuMC40-03</strong> Substrate Integrated Waveguide Signal-Interference Bandpass Filters</td>
<td><strong>EuMC41-03</strong> Surface Wave Engineering for Beam Control in Planar Millimetre-Wave Antennas</td>
<td><strong>EuRAD05-03</strong> Real-Time Processing of Multi-Channel SAR Data with GPUs</td>
</tr>
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<td>D. Psychogiu1, R. Gómez-García1, J. Muñoz-Ferreras2, D. Peroulis2,</td>
<td>T. D. Drysdale1, C. J. Vourch2, The Open University, Milton Keynes, United Kingdom, The University of Glasgow, Glasgow, United Kingdom</td>
<td>M. Otten1, W. Vlothuizen1, H. Spreeuw2, A. L. Varbanescu1, TNO, The Hague, Netherlands, Netherlands eScience Center, Amsterdam, Netherlands, University of Amsterdam, Amsterdam, Netherlands</td>
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<td></td>
<td>Purdue University, West Lafayette, United States, University of Alcala, Alcala de Henares, Spain</td>
<td>University of Perugia, Perugia, Italy, Universidad Miguel Hernández, Elche, Spain</td>
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<tr>
<td>12:40 - 13:00</td>
<td><strong>EuMC40-04</strong> A New Class of SIW Filters Based on Periodically Perforated Dielectric Substrate</td>
<td><strong>EuMC41-04</strong> Electronically-Reconfigurable Parallel-Plate Wave Launchers Based on Corrugated Substrate Integrated Leaky Waveguides with Tuneable Components</td>
<td><strong>EuRAD05-04</strong> Back Projection SAR Imaging using FFT</td>
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<td>L. Silvestri1, E. Massoni2, C. Tomassoni3, A. Covas4, M. Bozzi5, P. Ferro5, University of Pavia, Pavia, Italy, University of Perugia, Perugia, Italy, Universidad Miguel Hernandez, Elche, Spain</td>
<td>J. L. Gomez-Tornero1, R. Guzman-Quiros1, G. Gousetis2, S. Podlach2, Technical University of Cartagena (UPCT), Cartagena, Spain, Heriot-Watt University, Edinburgh, United Kingdom</td>
<td>A. Gaibel, A. Boag, Tel Aviv university, Tel Aviv, Israel</td>
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<tr>
<td>13:00 - 13:30</td>
<td><strong>EuMC40-05</strong> A Ka-Band Substrate Integrated Waveguide Diplexer with Wide Frequency Spread</td>
<td><strong>EuMC41-05</strong> Advances in Nonlinear, Active, and Anisotropic Artificial Impedance Surfaces</td>
<td><strong>EuRAD05-05</strong> Contrast Enhancement for an Iceberg Detector with a CFAR test using Dual-polarized Radar Imagery</td>
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<td>T. Jaschke, B. Rohrdantz, A. Mohncke, A. Jacob, Techn. Univ. Hamburg Harburg, Hamburg, Germany</td>
<td>D. Sievenpiper, J. Long, J. Lee, University of California San Diego, La Jolla, United States</td>
<td>A. Marino1, W. Dierking2,3, C. Wesche2, The Open University, Milton Keynes, United Kingdom, Alfred-Wegener-Institut, Bremerhaven, Germany, The Arctic University of Norway, Tromso, Norway</td>
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**Thursday**
EuRAD Poster01-01
Simulating Electronically Scanned Radar Systems
H. Chen, R. Gentile, MathWorks Inc., Natick, United States

EuRAD Poster01-02
Performance Assessment of FMCW Radar Processing for Transponder Identification.
L. Ghittari1, S. Meric1, C. Brousseau1, 2IETR, Rennes, France, 3Umr IETR, Rennes, France

EuRAD Poster01-03
Coherent Change Detection Experiments with GNSS-Based Passive SAR
D. Taagkas, M. Antoniou, M. Chemiakova, University of Birmingham, Birmingham, United Kingdom

EuRAD Poster01-04
Dual-Band Antenna Element for L-band and S-band Phased Array
J. Puskiel, A. Yarovsky, A. Roederer, Delft University of Technology, Delft, Netherlands

EuRAD Poster01-05
Frequency Diverse Array Radar using Symmetrical Frequency Offsets
W. Wang, University of Electronic Science and Technology of China, Chengdu, China

EuRAD Poster01-06
An Array-Error Estimation Method for Multi-Channel SAR Systems in Azimuth
L. Ma1, G. Liao2, A. Liu1, Y. Jiang1, L. Zhang1, ‘Chang’an University, Xi’an, China, 2Xi’an University, Xi’an, China

EuRAD Poster01-07
Bi-Objective Radar Waveform Design for Target Detection with Stopband Constraints
L. Wang, M. Wang, Y. Zeng, L. Wang, State Key Laboratory of Complex Electromagnetic Environment Effects on Electronics and Information System, Luoyang, China

EuRAD Poster01-08
A Modified Chirp Scaling Algorithm for Spaceborne SAR Real-Time Imaging
Z. Ding1, L. Chen1, T. Long1, Y. Zhu1, X. Yani1, 2Beijing Institute of Technology, Beijing, China, 3Beijing Institute of spacecraft System Engineering, Beijing, China

EuRAD Poster01-09
An Improved Noise Subspace Fitting Algorithm for Through-Wall Radar Imaging
C. Zheng1, G. Li1, Q. Zhang1, Naval Marine Academy, Guangzhou, China, 2Tsinghua University, Beijing, China, 3China Academy of Space Technology, Beijing, China

EuRAD Poster01-10
Waveform Diversity for SAR ECCM Based on Random Phase and Code Rate Transition
K. Lee, J. Song, W. Lee, Korea Aerospace University, Goyang-si, Republic of Korea

EuRAD Poster01-11
Target Dimensions Estimation Based on Sliding-Type Scattering Centres Analysis
Y. Liu, B. Peng, X. Wei, National University of Defense Technology, Changsha, China

EuRAD Poster01-12
Target Detecting Method for Passive Bistatic Radar using Stepped-Frequency Radar as the Transmitter
C. Lin, Q. Bao, D. Wang, R. Tian, Z. Chen, Science and Technology on Automatic Target Recognition Laboratory, Changsha, China

EuRAD Poster01-13
Migrating SPAR to Higher Frequencies
T. E. Bole, D. J. Carlson, MACOM Technology Solutions, Lowell, United States

EuRAD Poster01-14
Hardware Design and Realization of Transmit and Receive Paths for the Imaging MIMO Radar of the Radar Warning and Information System RAWIS
R. Panhuber, O. Biallawons, R. Klenke, FHR, Wachtberg, Germany

EuRAD Poster01-15
On Phase Measurement in FMCW Radar Systems
K. Siddiq1, M. K. Hobden2, R. J. Watson1, S. Pinna1, F. Scotti1, F. Laghezza1, S. Melo2, A. Bogoni2, 1Inter-university National Consortium for Telecommunications (CNIT), Pisa, Italy, 2Scuola Superiore Sant’Anna, Pisa, Italy

EuRAD Poster01-16
Sub-mm Displacement Measure via Multi-Band Phase estimation in a Photonics-Based Radar System
S. Penn1, F. Scotti1, F. Laghezza1, S. Melo2, A. Bogoni2, 1Inter-university National Consortium for Telecommunications (CNIT), Pisa, Italy, 3Scuola Superiore Sant’Anna, Pisa, Italy

EuRAD Poster01-17
An Experimental Study on Secondary Radar Transponder UMOA Characteristics
X. Lu, H. Ye, Z. Liu, Z. Huang, F. Wang, W. Jiang, National University of Defense Technology, Changsha, China

EuRAD Poster01-18
Perimeter Surveillance using a Combination of Radar and Optical Sensors
M. Hägelen, R. Kulke, R. Jetten, G. Möllenbeck, IMST GmbH, Kamp-Lintfort, Germany

EuRAD Poster01-19
The Influence of the Spatial Sampling in GPR Surveys for the Detection of Landmines and IEDs
F. Lombardi1, H. D. Griffiths1, M. Lualdi2, 1University College London, London, United Kingdom, 2Politecnico di Milano, Milan, Italy

EuRAD Poster01-20
Beamforming with Multi-Channel V-Band System-on-Chip Radar Platform for Gesture Sensing
R. W. Ungarathath1, T. E. Ebert1, A. Baheti3, R. W. Jungmaier1, S. Trott1, G. Eisenberg2, 1Technical University of Munich, Arcisstr. 21, Munich, Germany, 2Infinicon Technologies AG, Am Campeon, Neubiberg, Munich, Germany, 3Alten GmbH, Eisenheimerstrasse 55, Munich, Germany
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<td>14:20-14:40</td>
<td>EuMC46-01 Low-Loss Self-Switching Bandstop Filter</td>
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<td>S. Shin, A.C. Guyette, E.J. Naglich, US Naval Research Laboratory</td>
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<td>Washington, United States</td>
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<td>14:40-15:00</td>
<td>EuMC46-02 A Low-Loss Compact Stripline Low-Pass Filter for</td>
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<td>Millimetre-Wave Applications</td>
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<td></td>
<td>A. Gomez-Torrent, J. Arregui, J.D. Martinez, F. Teberio, J.V.</td>
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<td>Martinez, V. E. Borja, M.A. Gomez-Laso, Public University of</td>
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<td>Navarra, Pamplona, Spain, Universitat Politecnica de Valencia,</td>
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<td>15:00-15:20</td>
<td>EuMC46-03 Novel Miniature Slow-Wave Resonator Filter using</td>
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<td>Multilayer LCP Circuit Technology</td>
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<td>Z. Zhou, S.J. Hong, P.M. Iglesias, Heriot-Watt University, Edinburgh,</td>
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<td>United Kingdom, European Space Agency, Noordwijk, Netherlands</td>
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<td>15:20-15:40</td>
<td>EuMC46-04 Continuously-Tunable-Bandwidth Acoustic-Wave</td>
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<td>Resonator-Based Bandstop Filters and their Multi-mode Modeling</td>
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<td>D. Psychogiou, R. Gomez-Garcia, D. Peroulis, Purdue University,</td>
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<td>15:40-16:00</td>
<td>EuMC46-05 Synthesis and Design of Suspended Substrate Stripline</td>
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<td>Filters for Digital Microwave Power Amplifiers</td>
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<td>M. Martinez-Mendoza, A. Wentzel, M. Sandhu, A. Alvarez-Melcon,</td>
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<td>W. Heinrich, I.C. Hunter, Ferdinand-Braun-Institut, Berlin, Germany,</td>
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<td>University of Leeds, Leeds, United Kingdom, Technical University of</td>
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<td>14:20-14:40</td>
<td>EuRAD/EuMC04-01 A Combination Millimetre-Wave Doppler Radar and</td>
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<td>THz Spectrometer for Planetary Science</td>
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<td>K. B. Cooper, C. Bridi, G. Chattopadhyay, M. Choudhury, C. Cochrane,</td>
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<td>Skala, A. Tang, S. Tanelli, E. Gardin, N. Lumbart, California</td>
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<td>Institute of Technology, Pasadena, United States, Delft University</td>
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<td>of Technology, Delft, Netherlands</td>
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<td>14:40-15:00</td>
<td>EuRAD/EuMC04-02 Low-THz Rough Surface Imaging</td>
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<td>B. Willetts, M. Gachnova, A. Stove, C. Constantinou, E. Houre,</td>
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<td>University of Birmingham, Birmingham, United Kingdom</td>
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<td>15:00-15:20</td>
<td>EuRAD/EuMC04-03 A 220 GHz 3D Imaging Radar with Sub-μm³ Voxel</td>
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<td>Resolution for Security Applications</td>
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<td>D.A. Robertson, D.G. Macfarlane, T. Bryllert, University of St</td>
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<td>Andrews, United Kingdom, Wasa Millimetre Wave AB, Gothenburg, Sweden</td>
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<td>15:20-15:40</td>
<td>EuRAD/EuMC04-04 Focused Imaging by Geometric Optics for Real-Time</td>
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<td>Passenger Screening at Sub-Millimetre Wave Frequencies</td>
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<td>R. Herschel, G. Briese, S.A. Lang, N. Pohl, Fraunhofer FHR, Wachtberg,</td>
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<td>15:40-16:00</td>
<td>EuRAD/EuMC04-05 Detection and Tracking of Micro Aerial Vehicles with</td>
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<td>Millimetre Wave Radar</td>
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<td>M. Carls, S. Stanko, W. Johannes, S. Sieger, N. Pohl, Fraunhofer</td>
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<td>Institute for High Frequency Physics and Radar Techniques, Wachtberg,</td>
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<td>Germany</td>
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</table>

**Room 12**

**EuMC46**

**New Technologies for Filter Realization**

Chair: Richard Snyder, RS Microwave

Co-Chair: Vicente Boria, Universidad Politécnica de Valencia

**Room 1**

**EuRAD/EuMC04**

**Millimetre-Wave and THz Radar Applications**

Chair: Martin Vossiek, FAU

Co-Chair: Volker Ziegler, Airbus
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<th>Room 14</th>
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| 14:20 - 14:40 | **EuRAD06** Micro-Doppler and ISAR-Based Target Classification  
               Chair: Willem Hol, Thales Netherlands  
               Co-Chair: Stephen Harman, QinetiQ | **EuMC47** Applicators and Sensors for Medical Applications  
               Chair: Bart Nauwelaers, KU Leuven  
               Co-Chair: Nutapong Somjit, University of Leeds | **EuMC48** Energy Harvesting and Wireless Power Transfer  
               Chair: Alexandru Takacs, LAAS-CNRS  
               Co-Chair: Shigeo Kawasaki, JAXA |
| 14:40 - 15:00 | **EuRAD06-01** Detection of Jet Engines via Sparse Decomposition of ISAR Images for Target Classification Purposes  
               S. Wagner, F. Dommermuth, J. Ender, Fraunhofer Institute for High Frequency Physics and Radar Techniques, Wachtberg, Germany | **EuMC47-01** Cutting Human Tissue with Novel Atmospheric-Pressure Microwave Plasma Jet  
               A. Stephan1, H. Heuermann1, M. Prantner2,  
               1FH Aachen - University of Applied Sciences, Aachen, Germany, 2BOWA-electronic GmbH & Co. KG, Gomaringen, Germany | **EuMC48-01** Design of a Wide Dynamic Range Rectifier Array with Adaptive Power Distribution Technique  
               X. Wang, O. Abdelatty, A. Mortazavi, University of Michigan, Ann Arbor, United States |
| 15:00 - 15:20 | **EuRAD06-02** Multi-Target Human Gait Classification using Deep Convolutional Neural Networks on Micro-Doppler Spectrograms  
               R. Tronmel1, R. Harmanny1, L. Cifo1a, H. Dresser1a,  
               Delft University of Technology, Delft, Netherlands; 1Thales Nederland BV, Delft, The Netherlands | **EuMC47-02** Development of a 70 MHz Unit for Hyperthermia Treatment of Deep Seated Breast Tumors  
               J. Creese, G. van Tienhoven, M. W. Kolff,  
               J. Sjibrans, G. van Starn, S. Oldenborg,  
               E. D. Geijen, M. C. Hulshof, H. P. Kot,  
               Academic Medical Center, Amsterdam, The Netherlands | **EuMC48-02** A Compact Size and High Efficiency CMOS-IPD Rectenna using 2.5D Wafer-Level Packing for a Wireless Power Harvesting System  
               K. Liu, P. Wu, H. Tai, Y. Jiang, C. Yang,  
               G. Huang, National Applied Research Laboratories, Hsinchu, Taiwan |
| 15:20 - 15:40 | **EuRAD06-03** Performance Analysis of Co-Located and Distributed MIMO Radar for Micro-Doppler Classification  
               M. B. Ozcan1, S. Z. Gürbüz1,2, A. R. Persico3, C. Clemente1,  
               J. J. Soraghan1, 1TOBB University of Economics and Technology Ankara, Turkey, 2TUBITAK Space Technologies Research Institute, Ankara, Turkey; 3University of St Osborne, Glasgow, United Kingdom | **EuMC47-03** A New Haemostatic Device Utilising a Novel Transmission Structure for Delivery of Adrenaline and Microwave Energy at 5.8 GHz  
               S. C. Preston1, M. White1,  
               Z. Tsianous1, C. P. Hancock1,  
               Bangor University, Bangor, United States;  
               Creo Medical Ltd, Chester, United Kingdom,  
               1St Marks Hospital, Harewood, United Kingdom | **EuMC48-03** Cross Dipoles Rectenna for Microwave Applications  
               A. Okba1, S. Charlot1, P. Calmer1, A. Takacs1,  
               H. Aubert1, 1CNRS LAAS, Toulouse, France,  
               1Univ de Toulouse, Toulouse, France |
| 15:40 - 16:00 | **EuRAD06-04** Classification of Air Targets Based on Range-Doppler Diagrams  
               J. J. de Witt, P. van Doorn, A. G. Huizing, TNO,  
               The Hague, The Netherlands | **EuMC47-04** Manufacturing Technologies for UHF RFID Epidermal Antennas  
               S. Amendola1, A. Palombi1, L. Rousseau1,  
               G. Losargues1, G. Marmocco1,  
               University of Roma Tor Vergata, Rome, Italy,  
               IEEE-PEATi/ESYCOM, Noisy le Grand, United States | **EuMC48-04** Impact of Symbol Rate and Roll-off Factor on Rectifier RF-DC Conversion Efficiency for WiCoPT System  
               H. Shimamura1, R. Tanaka1, S. Yoshida1, S. Yoshida1,  
               K. Nishikawa1, S. Kawasak1, Kagoshima University, Kagoshima, Japan,  
               1JAXA, Sagamihara, Japan |
| 16:00 - 17:00 | **EuRAD06-05** Characteristics of the Radar Signature of Multi-Rotor UAVs  
               S. A. Harman, QinetiQ, Malvern, United Kingdom | **EuMC47-05** A Feasibility Study on Human Gait Monitoring using a Wearable K-Band Radar  
               Y. Tang, C. Li, Texas Tech University, Lubbock, United States | **EuMC48-05** A CMOS Full-Wave Rectifier with Threshold Compensation Based on Inherent Body-Voltage Control  
               L. Grassi1, R. Guerra1, G. Palmisano1,  
               University of Catania, Catania, Italy,  
               STMicroelectronics, Catania, Italy |

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| **EuMC49** Photonic Technologies for Terahertz Systems Engineering  
Chair: John Cunningham, University of Leeds  
Co-Chair: William J. Otter, Imperial College London | **EuMC50** APMC Selected Papers  
Chair: Stepan Lucyszyn, Imperial College London  
Co-Chair: Roberto Sorrentino, University of Perugia | **EuRAD/EuMC05** Millimetre-Wave Antenna Arrays  
Chair: Werner Wiesbeck, Karlsruhe Institute of Technology  
Co-Chair: Parbhu Patel, HMGCC |
| **EuMCK-01** Towards Optical Fiber Synthesis of Millimetre Waves  
A. Hallal, S. Bouhier, S. Le Mihauté, F. Bondu, Institut de Physique de Rennes (IPR), UMR UR1-CNRS 6251, Rennes, France | **EuMC50-01** Broadband Doherty Power Amplifier and Linearization  
W. Chen, X. Chen, Z. Wang, Tsinghua University, Beijing, China | **EuRAD/EuMC05-01** Double Circularly Polarized On-Chip Antenna for a 120-130 GHz Amplitude Monopulse Radar Application  
B. Goettel1, J. Schaefer1, H. Gulani1, W. Winkler1, T. Zwick1, 1Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany, 2Silicon Radar GmbH, Frankfurt (Oder), Germany |
| **EuMC50-01** Multi-Layers Stacked Patch-Antennas on Electro-Optic Material for Optical Modulation  
Y. Wijayanto1, A. Kanno2, T. Kawasaki3, H. Murata4, N. Imanamoto5, Y. Okamura6, National Institute of Information and Communications Technology, Tokyo, Japan, 1Indonesian Institute of Sciences, Bandung, Indonesia, 2Nagoya University, Japan, 3Osaka University, Osaka, Japan | **EuMC50-02** Frequency Reconfigurable Antenna for Future Wireless Communication System  
M. K. Rahim1, M. R. Hamidi2, N. A. Samuni3, 1Universiti Teknologi Malaysia, Johor, Malaysia, 2Universiti Tun Hussein Onn Malaysia, 3Batu Pahat Johor, Malaysia | **EuRAD/EuMC05-02** Lens Array Antenna for 71-76/81-86 GHz Point-to-Point Applications  
A. Mozharovskiy, A. Artemenko, O. Soykin, R. Maskennikov, Radio Gigabit LLC, Nizhny Novgorod, Russian Federation |
| **EuMC50-03** Improvements on Broadband Signals in Radio-over-Fiber Systems by Mode Filtering  
T. Cseh1, G. Fekete1, B. Becereli2, E. Udvardy3, A. Kibalan4, W. Kasza5, C. Vastur6, A. Billabert7, S. Faci1, J. Polleux1, C. Algan8, Budapest University of Technology and Economics, Budapest, Hungary, 1EISTE Paris and Université Paris Est, Paris, France | **EuMC50-03** Micromachined Switches and Phase Shifters for Transmit/Receive Module Applications  
S. K. Koul1, S. Dey1, A. K. Poddar2, U. L. Rohde2, 1Indian Institute of Technology, New Delhi, India, 2Synergy Microwave Corp., Paterson, United States | **EuRAD/EuMC05-03** 76-81 GHz Fully Planar Array Compatible LTCC Antenna Element for Automotive Radar Sensors  
F. Sickinger, E. Weissbrodt, Valeo Schalter und Sensoren GmbH, Bietigheim-Bissingen, Germany |
| **EuMC50-04** Delay-Line Optoelectronic Oscillator with All-Optical Gain  
K. Mitinichuk, A. Chich, S. Malychev, Stepanov Institute of Physics, Minsk, Belarus | **EuMC50-05** Quantum Mechanical Analysis of Graphene Travelling Wave Amplifier in THz Region  
N. Ghafarian, A. Majedi, S. Safavi-Naeini, University of Waterloo, Waterloo, Canada | **EuRAD/EuMC05-04** The Development of a Wideband 'Rocket' Phase-Array Feed  
A. R. Dunning, M. A. Bowen, D. B. Hayman, J. Kanapathippillai, H. Kanounik, R. D. Shaw, S. Severs, CSIRO, Sydney, Australia |
| **EuMC50-05** Millimetre-wave TX Phased Array with Phase Adjusting Function between Transmitters for Hybrid Beamforming with Interleaved Subarrays  
EuMC51
EuMW/EuMC Closing Session
Chair: Andrew Gibson, EuMW 2016 General Chair
Co-Chairs: Rob Sloan, EuMW 2016 Co-Chair and Steve Nightingale, EuMC 2016 Prizes Chair

16:40 - 17:10
Paradoxes in Modern Communications
Mark Pierpoint, Keysight Technologies
Today more than half of the data on the internet is being generated by mobile users, but the next wave of communications systems seeks to increase the number of users by an order of magnitude or more. This will stress the system in a variety of new ways and force trade-offs. This talk covers some of the paradoxical developments and discusses possible outcomes.

Dr Mark Pierpoint is Vice President and General Manager for Internet Infrastructure Solutions Business at Keysight Technologies Inc, Santa Rosa, California, where he is also responsible for 5G activities.

17:10 - 17:30
Awards Ceremony
Chair: Steve Nightingale, EuMC Prizes Chair
EuMC Microwave Prize
EuMC Young Engineer Prizes
Student Challenge Prize
Student Design Competition Prize

17:30 - 18:00
Microwave Measurements... The Quiet Revolution
Nick Ridler, National Physical Laboratory, UK
We live at a time when major changes are occurring in the way we live our everyday lives. Many of these changes are being brought about by advancements in technology achieved via ground-breaking research in science and engineering. A requirement with any new technology is the need to validate performance through reliable test and measurement. New technologies often require new types of measurement to be developed in order to be fit-for-purpose. This talk will describe some of the recent developments that have occurred in the area of microwave measurements in order to keep pace with the new developments taking place in science, engineering and technology. These measurements are impacting areas such as telecommunications, computing, security, healthcare and climate change monitoring. The talk will show how microwave measurements are being adapted and extended to cater for new technologies that underpin these areas. Several examples will be given showing the current state-of-the-art for these types of measurement.

Nick Ridler is the Science Leader for Electromagnetics at the UK’s National Physical Laboratory. He has more than 30 years’ experience working in both industrial and government scientific research establishments. His main area of interest is high-frequency precision electromagnetic measurement (1 kHz to 1 THz). He is a Visiting Professor at the University of Leeds (Institute of Microwaves and Photonics), the University of Surrey (Advanced Technology Institute) and the University of Liverpool (Department of Electrical Engineering and Electronics). He is a Fellow of the IEEE, a Fellow of the Institution of Engineering and Technology (IET) and a Fellow of the Institute of Physics (IOP). He is a Past Chair of the IEEE MTT Society’s “Microwave Measurements” Technical Committee, and, Past President of ARFTG (the Automatic RF Techniques Group).

18:00 - 18:20
Closing of European Microwave Conference 2016
Steve Nightingale
Closing of European Microwave Week 2016
Rob Sloan
Invitation to the European Microwave Week 2017
Arne Jacob, General Chair EuMW 2017
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<td><strong>EuRAD07</strong>&lt;br&gt;Adaptive Signal Processing and Beam Forming&lt;br&gt;Chair: Laurent Ferro-Famil, University of Rennes&lt;br&gt;Co-Chair: Debora Pastina, Sapienza University of Rome</td>
<td><strong>EuRAD08</strong>&lt;br&gt;Radar Systems Modelling&lt;br&gt;Chair: Hjalti Sigmansson, Oklahoma University&lt;br&gt;Co-Chair: Mateo Burgos Garcia, Polytechnic University of Madrid</td>
<td><strong>EuRAD09</strong>&lt;br&gt;Antennas and Front Ends 2&lt;br&gt;Chair: Anthony Brown, Manchester University&lt;br&gt;Co-Chair: Manuel Sierra Castañer, Universidad Politécnica de Madrid</td>
<td><strong>EuRAD10</strong>&lt;br&gt;Radar Applications&lt;br&gt;Chair: Pierfrancesco Lombardo, University of Rome&lt;br&gt;Co-Chair: Mayazumaa Ruggijano, Thales Nederland</td>
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<tr>
<td><strong>EuRAD07-03</strong>&lt;br&gt;A Fast Grid-Based Clustering Algorithm for Range/Doppler/DoA Measurements&lt;br&gt;T. Wagner, R. Feger, A. Stelzer, Johannes Kepler University Linz, Linz, Austria</td>
<td><strong>EuRAD08-03</strong>&lt;br&gt;Analytical Modeling and Numerical Validation of Forward Scattering for Radar Applications&lt;br&gt;M. T. Falconi, D. Coriote, D. Pastina, A. Galli, F. T. Marzano, P. Lombardo, Sapienza University of Rome, Rome, Italy</td>
<td><strong>EuRAD09-03</strong>&lt;br&gt;Precision Approach Radar, Azimuth Antenna Unit&lt;br&gt;V. Zavodny, P. Kopecky, Eldis Pardubice Ltd, Pardubice, Czech Republic</td>
<td><strong>EuRAD10-03</strong>&lt;br&gt;Infuence of Internal Structure on Landmine Radar Signatures&lt;br&gt;F. Lombard, H. D. Griffiths, A. Balleri, University College London, London, United Kingdom, Cranfield University, Cranfield, United Kingdom</td>
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<td><strong>EuRAD07-05</strong>&lt;br&gt;Improved ESPRIT Method Used for 2D-DOA Estimation in Tracking Radars&lt;br&gt;Y. Fayad, C. Wang, Q. Cao, Nanjing University of Aeronautics and Astronautics, Nanjing, China</td>
<td><strong>EuRAD08-05</strong>&lt;br&gt;Design of Impulse UWB Transmitters using IF Direct Conversion, Built with General Purpose Instrumentation&lt;br&gt;A. Papo-Ceneda, V. Gómez-Pena, J. Jimeño-Martí, A. Bianzo-de-Campo, W. Hernandez, D. Segovia-Vargas, Universidad Politécnica de Madrid (UPM), Madrid, Spain</td>
<td><strong>EuRAD09-05</strong>&lt;br&gt;Measurement of MSSR Transmitters using IF Direct Conversion, Built with General Purpose Instrumentation&lt;br&gt;A. Parra-Ceneda, V. Gonzávez-Pérez, J. Jimeño-Martí, A. Bianzo-de-Campo, W. Hernando, D. Segovia-Vargas, Universidad Politécnica de Madrid (UPM), Madrid, Spain</td>
<td><strong>EuRAD10-05</strong>&lt;br&gt;Permanent Scatterers in Space-surface Bistatic SAR using Beidou-2/Compass-2 as Illuminators: Preliminary Experiment Results and Analysis&lt;br&gt;Z. Teng, T. Zhang, W. Tian, C. Hu, Beijing Institute of Technology, Beijing, China</td>
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**THURSDAY**
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<td><strong>EuRAD11</strong>&lt;br&gt;Target Localisation and Tracking&lt;br&gt;Chair: Laith Danoon, Manchester University&lt;br&gt;Co-Chair: M. Mayazzura Ruggiano, Thales Netherlands</td>
<td><strong>EuRAD12</strong>&lt;br&gt;Polarimetric Radar and Applications&lt;br&gt;Chair: Felix Yanovsky, National Aviation University of Ukraine&lt;br&gt;Co-Chair: Mike Cherniakov, University of Birmingham</td>
<td><strong>EuRAD13</strong>&lt;br&gt;EW and Radar&lt;br&gt;Chair: Andy Stove, Stove Specialties&lt;br&gt;Co-Chair: Krzysztof Kulpa, Warsaw University of Technology</td>
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<td><strong>EuRAD11-01</strong>&lt;br&gt;Modeling Range-Only Multistatic Radar Target Detection with Interval Characterisation&lt;br&gt;W. Al Mashhadani, L. Danoon, A. Brown, University on Manchester, Manchester, United Kingdom</td>
<td><strong>EuRAD12-01</strong>&lt;br&gt;Design and Demonstration of a Full Polarimetric Sensor for Surface Texture Characterisation&lt;br&gt;C. Erhart, T. Letz, T. Walter, H. Muntz, P. Hügler, R. Weigel, University of Applied Sciences Ulm, Ulm, Germany, University of Ulm, Ulm, Germany, Friedrich Alexander University of Erlangen-Nuremberg, Erlangen, Germany</td>
<td><strong>EuRAD13-01</strong>&lt;br&gt;Radar Resource Management Study for Multifunction Phased Array Radar&lt;br&gt;M. Schikorr, U. Fuchs, M. Bockmair, Airbus DS Electronics and Border Security GmbH, Ulm, Germany</td>
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<td><strong>EuRAD11-02</strong>&lt;br&gt;An Enhanced Wavefront Extraction Algorithm for Super-Resolution Ultra Wideband Radar Systems Based on Correlation&lt;br&gt;B. Frederich, D. Dmyanov, T. Schultz, L. H. Willims, University Duisburg-Essen, Duisburg, Germany</td>
<td><strong>EuRAD12-02</strong>&lt;br&gt;Copula Analysis of Full Polarimetric Weather Radar Complex Signals&lt;br&gt;F. J. Yanovsky, A. N. Rudakova, R. B. Sinitsyn, Y. A. Averyanova, National Aviation University of Ukraine, Kiev, Ukraine</td>
<td><strong>EuRAD13-02</strong>&lt;br&gt;A Fast ELINT Receiver Design&lt;br&gt;A. Alparslan, K. Yegin, 'Tubitak, Kocaeli, Turkey, 'Ege University Faculty of Engineering, Izmir, Turkey</td>
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<td><strong>EuRAD11-03</strong>&lt;br&gt;Positioning of Moving Non-Line-of-Sight Targets Behind a Corner&lt;br&gt;T. Johansson, A. Andersson, M. Gustafsson, S. Nilsson, Swedish Defence Research Agency (FOI), Linköping, Sweden</td>
<td><strong>EuRAD12-03</strong>&lt;br&gt;Test and Validation of Particle Classification Based on Meteorological Model and Radar Simulator&lt;br&gt;N. Roberto, E. Adroso, S. Baldini, S. Licchi, A. Lupidi, F. Cuccoli, L. Barcaroli, L. Facheris, ISAC, Rome, Italy, CMT, Pisa, Italy, University of Florence, Firenze, Italy</td>
<td><strong>EuRAD13-03</strong>&lt;br&gt;Real-Time Channel Emulator for Radar-Altimeters Characterization&lt;br&gt;A. Parisi, M. Mouhamedou, C. Decroze, D. Carzaniga, S. Talliet, G. Geneste, XLIM Research Institute, Limoges, France, Thales Communications &amp; Security, Brive La Gaillarde, France</td>
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<td><strong>EuRAD11-05</strong>&lt;br&gt;Multi-target Tracking Based on δ-GLMB Filter with Amplitude Information&lt;br&gt;C. Yuan, J. Wang, S. Wei, H. Xiang, Beihang University, Beijing, China</td>
<td><strong>EuRAD12-05</strong>&lt;br&gt;W-Band Digital Variable Polarized Monopulse Measurement Radar&lt;br&gt;Z. Li, Y. Xiao, G. Zhao, S. Lu, H. Sun, R. Tao, Beijing Institute of Technology, Beijing, China</td>
<td><strong>EuRAD13-05</strong>&lt;br&gt;A Novel Full Duplex Active Countermeasure System for Artificial Target Generation&lt;br&gt;P. Ratna, ASL, Hyderabad, India</td>
</tr>
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EuRAD14
Automotive and Vehicular Radar Applications
Chair: Christian Waldschmidt, University of Ulm
Co-Chair: Chris Duff, University of Manchester

11:20 - 11:40
EuRAD14-01
Pedestrian Recognition using 79 GHz Radars for Intersection Surveillance
W. Liu, T. Kasahara, M. Yasugi, Y. Nakagawa, Panasonic System Networks Co., Ltd., Yokohama, Japan

11:40 - 12:00
EuRAD14-02
Enhancement of Doppler Resolution for Chirp-Sequence Modulated Radars
F. Roos1, M. Barjenbruch2, N. Appenrodt3, J. Dickmann3, C. Waldschmidt1, 1Ulm University, Ulm, Germany, 2Daimler AG, Stuttgart, Germany, 3Daimler AG, Ulm, Germany

12:00 - 12:20
EuRAD14-03
RCS Characteristics of Street Curbs and the Applications in Automotive Radar Classification
A. Ioffe1, W. Doerr1, H. Yan1, D. Vu1, Delphi Deutschland GmbH, Wuppertal, Germany, 1Delphi Automotive, Agoura Hills, United States

12:20 - 12:40
EuRAD14-04
A High Bandwidth Radar Target Simulator for Automotive Radar Sensors
M. Engelhardt1, F. Pfeiffer2, E. Biebl1, 1TU München, München, Germany, 2Perisens GmbH, Garching bei München, Germany

12:40 - 13:00
EuRAD14-05
Repeated Symbols OFDM-MIMO Radar at 24 GHz
G. Hakobyan1, M. Girma1, X. Li, N. Tammireddy1, B. Yang1, 1Robert Bosch GmbH, Stuttgart, Germany, 1University of Stuttgart, Stuttgart, Germany

EuRAD15
EuRAD Closing Session
Chair: David Daniels, EuRAD 2016 Chair
Co-Chair: Albert Huizing, EuRAD 2016 Co-Chair

13:00 - 14:20
Lunch in Lounge
14:20 - 14:25
Invited Speaker Introduction
David Daniels
14:25 - 15:25
Early History of Bistatic Radar
Professor Hugh Griffiths, UCL, UK
Professor Hugh Griffiths, THALES/Royal Academy of Engineering Chair of RF Sensors in the UCL Department of Electronic and Electrical Engineering. Professor Griffiths has led radar research at UCL for more than 20 years. His group carried out some of the first experiments in passive radar, and recently published first results on the statistical nature of bistatic radar sea clutter. He is a past recipient of the IEEE Nathanson Award and the Maxwell and Mountbatten Premium Awards of the IEE, and he was elected to Fellowship of the Royal Academy of Engineering in 1997. In studying the history of radar, it is apparent that several of the earliest experiments were bistatic. One reason for this is that the transmit-receive switch was not invented till WW2. It is interesting therefore to examine some of the earliest bistatic radar experiments in the light of our current knowledge and experience. The paper and presentation will describe Appleton’s 1924 experiments to measure the height of the ionosphere (also the first FM radar), Watson-Watt’s celebrated Daventry Experiment in 1935, and the German WW2 Klein Heidelberg system, which used the British Chain Home radars as its illumination source and which was the first proper operational bistatic radar.
15:25 - 15:45
EuRAD Awards Ceremony
Chair: Ali Rezazadeh, EuMW 2016 Awards Chair
EuRAD Best Paper Award
EuRAD Young Engineer Prize
15:45 - 15:55
Closing of EuRAD 2016
David Daniels, EuRAD 2016 Chair
15:55 - 16:00
Invitation to EuRAD 2017 in Nuremberg
Martin Vossiek, FAU Erlangen-Nuremberg, EuRAD 2017 Chair
Welcome from the Workshop and Short Courses Chair

The EuMW 2016 organising committee is pleased to be able to offer an extensive and diverse programme of workshops and short courses throughout the entire week.

The wide ranging programme of half-day and full-day workshops and short courses has been chosen to cover a range of important topics of interest to the whole EuMW community. Theoretical and technological aspects are covered along with current and developing system applications. Key themes highlighted by the programme include: 5G communications; GaN, CMOS and SiGe technologies and their applications in the mm-wave and THz bands; additive manufacturing and 3D printing; developments in space based technologies, including satellite communication on the move and wireless power transfer; and automotive, multistatic and space based radar. Fundamentals of power amplifiers are introduced in a short course, whilst advanced power amplifier themes, such as waveform engineering, GaN developments and mm-wave/THz power generation, are covered in a series of workshops.

We are very grateful to all the organisers, presenters and authors of workshop and short course materials for their hard work and dedication before and during the conference.

Each workshop and short course is individually endorsed by one or two of the conferences making up EuMW. However, they are available and accessible to any scientist or engineer wishing to gain a broader perspective on microwave and RF systems and devices, or to learn about a new specialism within our broad field. Workshop organisers have been asked to provide plenty of time within their events for discussion and interaction, and we hope that you will benefit from participating in the international networking opportunity that this presents.

This year the pattern of workshops and short courses differs from that of previous years in that there are sessions on Tuesday and Thursday, and many more on Friday, but none on Sunday. The EuMIC endorsed sessions are scheduled on Wednesday onwards, after the end of the main EuMIC conference sessions. The mixture of Friday workshops and short courses includes sessions endorsed by each of the three conferences. We are confident that this structure will enable you to find at least one workshop or short course to incorporate into your schedule for the week, to enhance your conference experience in London.

Slides for the workshops and short courses will be provided electronically at the conference on a separate USB stick, for those who register for one or more of them. No hard copies of the slides will be provided. There will also be a facility for workshop and short course delegates to download the slides approximately two weeks before the conference. Instructions for the download process will be provided after you have registered.

Peter Gardner
Workshops and Short Courses Chair
**WM01**

Reconfigurable RF & Microwave Passive Components for Emerging Wireless Systems

**Organisers:**
Roberto Gómez-García, University of Alcalá, Madrid, Spain
Dimitra Psychogiou, Purdue University, West Lafayette, IN, USA

**Abstract**

Latest trends towards the development of modern frequency-agile multi-mode RF front-ends for emerging wireless applications (e.g., software-defined-radio (SDR) transceivers for 5G and multi-functional radars) create new challenges in the field of reconfigurable microwave electronics as enabling technologies. New requirements especially extend to the area of Tunable RF/microwave passive components (e.g., filters for signal-band pre-selection and interference mitigation, phase shifters, matching networks, and antennas) as they can be found in basically all high-frequency transmitter and receiver chains. The aim of this workshop is to provide an overview of the most recent research findings in the exciting area of reconfigurable RF/microwave passive components. This includes the development of sophisticated Tunable RF/microwave passive devices that exploit advanced materials and non-conventional techniques for tuning, such as Liquid Crystal (LC), Barium Strontium Titanate (BST), multi-layer low-temperature co-fired ceramic (LTCC), and microfluidic principles to cover frequency ranges starting at the microwave range and covering up to the sub-THz band with advantages in terms of frequency agility, power handling, and DC-power-bias saving. Advances at the circuit-architecture level through several examples of unprecedented reconfigurable passive devices, such as RF-power-dependent reconfigurable filters, multiplexers and Tunable high-Q filters based on controllable cavities and hybrid acoustic-lumped-element technologies, will be presented. Moreover, the implications and expected operational benefits from the integration of these adaptive RF/microwave passive components in fully-Tunable RF front-ends will be discussed.

**Programme**

*09:00 - 09:10 Welcome and Introduction*

*09:10 - 09:55 Tunable RF and Microwave Component Technologies Based on Functional Materials*
Holger Maune and Rolf Jakoby, Technische Universität Darmstadt, Germany

*09:55 - 10:40 LTCC Based Tunable and Reconfigurable Microwave Components*
Atif Shamim, King Abdullah University of Science & Technology, Saudi Arabia

*10:40 - 11:20 Coffee Break*

*11:20 - 12:10 Microwave and Millimetre Wave Adaptive Components and Radios*
Tauno Vähä-Heikkilä, MilliLab, Finland

*12:10 - 13:00 Agile Front Ends for Mobile Radios*
Arthur Morris, WiSpry, Inc., USA

*13:00 - 14:20 Lunch Break*

*14:20 - 15:10 Adaptive RF front-End Filtering Solutions*
Dimitrios Peroulis, Purdue University, USA

*15:10 - 16:00 Reconfigurable Microwave Planar Filters*
Jia-Sheng (Jason) Hong, Heriot-Watt University, UK

*16:00 - 16:40 Coffee Break*

*16:40 - 17:15 Multiband Tuneable Filters and Antennas with Innovative Technologies*
Pierre Blondy, XLIM, University of Limoges, France

*17:15 - 17:50 RF-Power-Dependent Reconfigurable Filters and Multiplexers for Frequency-Selective Limiting*
Andrew C. Guyette and Eric J. Naglich, Naval Research Laboratory, USA

*17:50 - 18:20 Microfluidically Tuneable Miniaturized Microwave Filters with Watt-level Power Handling*
Kamran Entesari, Texas A&M University, USA

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**WM02**  
**Millimetre-Wave Electronics for High Capacity Wireless Networks**

**Organisers:**  
Claudio Paoloni, Lancaster University  
Valerio Frascolla, Intel Deutschland GmbH

**Abstract**  
The quantum leap for high capacity everywhere will be born from a new generation of wireless networks at mm-wave frequencies. Only those frequency bands are wide enough to support the multigigabit data rate targeted by 5G networks. The challenge is formidable, due to the combination of a millimetre wave technology which is not yet completely mature and the link obstacles such as atmospheric attenuation, diffraction, range.

This workshop will offer the vision on the state of the art in the field of millimetre wave wireless networks through the latest update from renowned experts from operators, electronic manufacturers and academia. The complementary synergies of two large Horizon 2020 projects, mmMAGIC and TWEETHER, will disclose new routes for an integrated approach, for developing new electronic components and systems to define new architecture for anticipating the future of wireless communications.

This workshop is oriented to operators, service providers, manufacturers and academics in the field of wireless communications systems.

Four high calibre keynote speakers and six thematic talks will provide the audience an outstanding overview on millimetre wave wireless networks and stimulating concepts and materials for a lively and constructive discussion. We expect to seed a fresh vision for the future wireless communication paradigms.

A World Café will close the workshop to link ideas within a large group to leverage on the “collective intelligence” in the room: participants move among a series of small groups/tables where they continue the discussion in response to a set of questions, which are predetermined and focused on the specific goals of the workshop.

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**Programme**

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<td>Welcome and Introduction of the Workshop</td>
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<td>09:10</td>
<td>Keynote: Millimetre-Wave as the Key Technology to Solve the Backhaul and Front-Haul Bottleneck for the Next Generation Mobile Networks</td>
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<td></td>
<td>Renato Lombardi, Huawei, Italy</td>
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<tr>
<td>09:40</td>
<td>Millimetre-Wave Transceiver Design for Multi-Gigabit Mobile Backhaul Applications</td>
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<td>Chris Buck, Filtronic, UK</td>
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<td>10:00</td>
<td>MMC Chip-Set Development for Broadband W-Band Receivers and Transmitters</td>
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<td>Viktor Krozer, Goethe University of Frankfurt am Main, Germany</td>
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<td>10:20</td>
<td>TWEETHER - W-Band High Capacity Wireless Networks</td>
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<td>Claudio Paoloni, Lancaster University, UK</td>
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<td>10:40</td>
<td>Coffee Break</td>
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<tr>
<td>11:20</td>
<td>Keynote: Millimetre Wave Radio Systems - The Next Frontier</td>
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<td>Andy Sutton, BT, UK</td>
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<td>11:50</td>
<td>5G Architecture And Integration Solutions for an Edge-Less User Experience</td>
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<td>Krystian Safjan, Nokia Networks, Finland</td>
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<td>12:10</td>
<td>Round Table “Are the Millimetre Wave Technologies Mature for the Wireless Market?”</td>
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<td>13:00</td>
<td>Lunch Break</td>
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<td>14:20</td>
<td>Opening of the Second Part of the Workshop</td>
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<td>14:35</td>
<td>Keynote: The mmMAGIC Project: New frontiers in 5G Mobile Communications and Network Architecture Above 6 GHz</td>
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<td>Maziar Nekovee, Samsung, UK</td>
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<td>15:10</td>
<td>Radio Interface Design for mmwave Mobile Radio Access Networks</td>
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<td>Jian Luo, Huawei Technologies Dusseldorf GmbH, Germany</td>
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<td>15:35</td>
<td>6–100 GHz Channel Modeling for 5G: Perspective and Outcomes of mmMAGIC</td>
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<td>Wilhelm Kreuzen, Fraunhofer Heinrich-Hertz-Institute, Germany</td>
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<td>16:00</td>
<td>Coffee Break</td>
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<tr>
<td>16:40</td>
<td>Keynote: Millimeter Wave Antenna Technology Evolution: From Wi-Fi to 5G</td>
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<td>Alexander Maltsev, Intel Corporation, Germany</td>
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<tr>
<td>17:10</td>
<td>World Café</td>
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<td>18:00</td>
<td>Open Discussion and Concluding Remarks</td>
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Additive Manufacturing (AM) has the potential to change how future space products are designed, integrated and operated. This technology is considered already as a strategic technology approach for space applications. AM will enable design for performance, mass optimization and easy design changes while also massively reducing the design/manufacturing/assembly cycle costs as well as providing an environmentally friendly alternative to conventional machining. AM is also considered as key enabling technology for miniaturisation of complex small systems.

AM can be considered a breakthrough technology for the development of RF hardware. The use of this process allows the manufacture of RF hardware to achieve enhanced performance. RF, thermal and mechanical performance can be improved by using the additional design freedom provided by AM.

The assessment of different AM approaches for RF hardware has already started and will consider the whole process chain, including design, material supply, processing, post processing, qualification and verification, and standardisation. This assessment exercise is helping to identify already those AM approaches (materials, designs, processing, etc.) best suited for the manufacturing of RF hardware.

However, the goal of AM is not to replace well known and consolidated manufacturing approaches such as milling, but to exploit the additional freedom for advanced designs.

This workshop will be focused in three main aspects related to the use of AM for the manufacturing of RF hardware.

The first part will introduce the AM process and review its features. The suitability of AM for the space sector will be also addressed. In the second part, the impact of AM in satellite systems will be presented followed by the third part where some manufacturing approaches and real examples will be presented by companies and universities.
Wireless Power Transmission for Space Applications

Organisers:
Nuno Borges Carvalho, Instituto de Telecomunicacoes, Universidade de Aveiro, Portugal
Alessandra Costanzo, University of Bologna, Italy

Abstract
Wireless Power Transmission is a technology that has existed for many years. It goes back to Nichola Tesla. Nevertheless technology was not mature enough to consider it as a solution for high reliability requirements.

Recently the WPT technology gained a new breakthrough with a significant number of commercial applications appearing on earth-based applications, which created a wave of interest not only for near field WPT as is used in most of the earth-based solutions, but also for far field solutions which seems to have much more interest in space solutions where several techniques could be used with different legal framing.

In this workshop the main objective is to discuss and to explore WPT in space environments and address potential solutions for space applications, spanning from WPT satellites, WPT for space shuttles, WPT Technologies for Space Solar Power, Beam Efficiency of Beam-Type Wireless Power Transfer via Radio Wave with Phased Array.

The speakers cover different international quadrants, from USA, Japan and Europe. It is expected that the workshop talks and subsequent discussions would allow a new vision and promote ideas in this new emerging technology field.

Programme
09:00 - 09:10 Welcome
09:10 - 09:55 Opportunities, Challenges and Recent Advances in Wireless Power Technologies for Space Solar Power
Paul Jaffe, U. S. Naval Research Laboratory - Naval Center for Space Technology, Washington, USA
09:55 - 10:40 Impact of Modulation Scheme on Rectifier RF-DC Efficiency and Optimal Input Signal Control Technique
Kenjiro Nishikawa, Kagoshima University
10:40 - 11:20 Coffee Break
11:20 - 12:05 Circuit and System Solutions for Dynamic RF Energy Transfer
Alessandra Costanzo, DEI, University of Bologna
12:05 - 12:50 Powering up Space Probes
Nuno Carvalho, Instituto de Telecomunicacoes- Universidade de Aveiro
12:50 - 13:00 Open Discussion
13:00 - 14:20 Lunch Break
14:20 - 15:05 Autonomous WPT System with Multiple Controlled Propagation Directions for Receivers Distributed In 3D Space
Jerzy Michalski, SpaceForest, Gdansk, Poland
15:05-15:50 High-efficiency and Ultra-Compact Microwave Rectenna for Space Applications
Alexandru Takacs, CNRS, LAAS, Toulouse, France
16:00 - 16:40 Coffee Break
16:40 - 17:25 Beam Efficiency of Beam-Type Wireless Power Transfer via Radio Wave with Phased Array
Naoki Shinohara, Kyoto University, Japan
17:25 - 18:05 Optimization of WPT Systems Transmitting Digitally Modulated Signals and other Waveforms with Time-Varying Envelope
Apostolos Georgiadis and Bruno Franciscatto, CTTC, Barcelona, Spain and Drayson Technologies, UK
18:05 - 18:20 Open Discussion and Concluding Remarks
WM05
Microwave Passive and Active Devices with Integrated Filtering Functions

Organisers:
Yi Wang, University of Greenwich, UK
Michael J. Lancaster, University of Birmingham, UK

Abstract
Over the last few years, there has been some exciting work reported on integrating filtering functions in various passive, active components and antennas. Many novel circuit concepts and co-design techniques have been demonstrated, such as co-designed amplifiers and filters, integrated filter-antennas, filtering power dividers, couplers and all-resonator-based multiplexers with resonant junctions etc. Traditionally filters are designed independently assuming 50 ohm matching interfaces and interconnected with other RF components. However, using the integration approach, the interfaces can be entirely eliminated and the associated mismatching and performance degradation issues can be avoided. Additionally, the integration of circuit functions could lead to significant reduction of the circuit footprint.

It is not just about close proximity of two components. To realise embedded filtering functions, various integration schemes have been demonstrated. For passive components such as dividers and couplers, the transmission lines can be replaced with resonators or signal-interference filtering sections. For multiplexers, the signal distribution and matching networks can be replaced with one or multiple resonator-junctions. In antennas, the resonant radiating element can be utilised to form one resonant pole in a filter. In active components, the filter and amplifier can be co-designed and the matching network can be implemented using resonators.

This workshop will present the recent development of new circuit concepts, design methods and implementation techniques in this area. The speakers will outline the application potentials, design challenges and solutions. This will allow the audience to explore the opportunities presented by this emerging circuit technology.

Programme
09:00 - 09:10 Welcome
09:10 - 09:40 Co-Design of High-Q Tuneable Filters with Active Devices
D. Peroulis, Purdue University, West Lafayette, IN, USA
09:40 - 10:10 Integrated Filtering Power Dividers, Antennas and Arrays
Y. Wang, University of Greenwich, UK; S. Gao, University of Kent, UK
10:10 - 10:40 Compact Power Distributing Devices and Power Amplifiers with Integrated Filtering Response
X. Zhang, South China University of Technology, Guangzhou, China
10:40 - 11:20 Coffee Break
11:20 - 11:50 Waveguide Components Based on all Coupled Resonators
X. Shang, M. J. Lancaster, University of Birmingham, UK
11:50 - 12:20 Single/Multi-Band Power-Distribution and Impedance-Transformation Planar Circuits with Added Static and Reconfigurable Bandpass Filtering Functionality
R. Gomez-Garcia, University of Alcala, Madrid, Spain; D. Psychogiou and D. Peroulis, Purdue University, West Lafayette, IN, USA
12:20 - 12:50 Synthesis Techniques for Multiplexers and Multiport Selective Networks
G. Macchiarella, Politecnico di Milano, Italy
12:50 - 13:00 Open Discussion and Concluding Remarks

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WM06
Current and Future Use of Spectrum by PMSE - 3rd PMSE Workshop at EuMW

Organisers:
Georg Fischer, University of Erlangen-Nürnberg, Germany
Matthias Fehr, Co-President APWPT, Germany
Alan March, Co-President APWPT, United Kingdom

Abstract
PMSE (Program Making and Special Events) equipment has become, in particular, a fundamental element of our daily cultural life and wireless systems for audio, video and effect control are now essential tools for modern content production. They are employed in journalistic news coverage, sports events, theatres, by educational and cultural institutions, trade fairs, film productions, live music events, conference-centres, churches, sports clubs, etc.

PMSE is facing dramatic changes in its spectrum allocations worldwide and its coordination with other wireless services. On the other hand PMSE use and requirements regarding link availability, latency and quality are ever increasing. New techniques for spectrum management and transmission schemes are discussed in standardisation and regulation to meet these challenges.

In this workshop we would like to discuss with the participants the various types of PMSE applications, their spectrum use and impact of currently foreseeable changes in Radio Spectrum allocations. What decisions need to be taken at both a European and national level?

PMSE’s current status and its future outlook is discussed. The WS will start with an analysis of WRC-15 outcome on spectrum assignments for PMSE. As PMSE equipment is typically carried on body, a detailed look at the body effect will be taken. Results on absorption are needed for calculation of protection and interference levels. Studies on new spectra for compensation of lost spectrum at UHF will be presented. The driving forces behind increase of communications and fundamental limitations to consider from information theory perspective are discussed.

New PMSE technologies, i.e. the cognitive radio approach, were studied in industry and standards to ensure a high availability of PMSE links in the future. We discuss the advantages and possible limitations of such new PMSE technologies.

In the following we will also have a look at the socioeconomic benefit generated by the cultural and creative industry relying on PMSE.

The workshop will contain several panel rounds to allow for interactive discussion with the audience. A warm welcome to join our discussions!

Programme
Get Together will start 30 minutes ahead of official WS start
09:00 - 09:15 Welcome and Brief Introduction in the WS
Alan March, APWPT Co-President, UK

I. The Application PMSE
09:15 - 09:35 Short Introduction to PMSE
Norbert Hilbich, APWPT, Germany

II. PMSE as an Object of Science, Study Groups and Manufacturers
09:35 - 09:55 Outcome of WRC-15, Consequences for PMSE in international Working Groups and the possible Harmonisation Process(es)
Matthias Fehr, Co-President APWPT, Germany
09:55 - 10:20 PMSE Body Effect and Outlook for PMSE Operation at Higher Frequencies
Dr Ivica Stevanovic, BAKOM (Swiss federal authorities), Switzerland
10:20 - 10:40 How to Measure PMSE Live Spectrum Use?
Matthias Fehr, DKE AK731.0.8 in DIN and VDE, Germany, Andy Lillywhite
10:40 - 11:20 Coffee Break

11:20 - 11:40 The Suitability of Aircraft and Satellite Spectrum to Share with PMSE
Vaughan John, OFCOM, United Kingdom
11:40 - 12:00 Result of Spectrum Activities of ETSI and CEPT for Audio and Video PMSE
Brian Copsey, ASP and Chairman ETSI TG17WG3, UK

III. Effect of Changes
12:00 - 12:30 Analysis of Changes in PMSE spectrum - our Prediction for PMSE, operated under changed Conditions
Georg Fischer, University Nuernberg-Erlangen, Germany
12:30 - 13:00 Economic Value of the Culture and Creative Industry (in United Kingdom)
Peter Roberts, BEIRG, United Kingdom
13:00 - 14:20 Lunch Break
14:20 - 15:00 Panel Discussion: Changes in PMSE spectrum their Impact on Culture and Creative Segment
Can national PMSE regulation entirely support PMSE equipment user requirements in the future?

IV. Practical Needs
15:00 - 15:50 Discussion on Advantages of new PMSE Technologies and their possible Limitations
Wolfgang Bilz, Vice-President of APWPT, Germany
16:00 - 16:40 Coffee Break
16:40 - 17:30 Panel Discussion: Changes in PMSE spectrum allocations their impact on Cultural and Creative Segments.
17:30 - 17:40 Closing Remarks
Alan March, APWPT Co-President, United Kingdom
17:40 - 18:20 Meet the Presenter
New Developments for Satellite Communications on the Move

Organisers:
Patrick Schuh, Airbus Defence and Space
Arne Jacob, Hamburg University of Technology
Fabrizio De Paolis, European Space Agency, ECSAT, United Kingdom
David Seguin, European Space Agency, ESTEC, The Netherlands

Abstract
This workshop will focus on the various technology and product aspects associated with the advancement of RF/antenna systems for satellite communication on moving platforms (SatCom-on-the-move, SOTM). The workshop consists of two parts.

Part 1 will be aimed to provide a broad scope of the technologies for these new systems. Today and in future there will be an increasing demand for datalinks on moving platforms (“Internet-Everywhere”). New semiconductor technology (especially SiGe) and system concepts are key enablers for new planar antennas. Phased arrays play a major role in modern systems and include just about every aspect associated with the microwave community. Recently there were many new advancements in this field. Part 1 presentations have their focus on the MMIC and/or antenna design.

The SOTM market is booming especially in the area of Aeronautical applications, to which Part 2 is dedicated. Players like Viasat, Panasonic, Inmarsat, and many others are offering, or planning to offer, satellite based solutions for providing connectivity to airline passengers. Furthermore, there is an increasing interest towards Remotely Pilot Aircrafts (RPAs) relying on satellite communication. In this context, microwave component and system manufacturers are investing significant amounts of R&D resources in order to increase their competitiveness in the SatCom industry. Part 2 presentations will offer an overview of the different challenges to be faced by the microwave community.

Programme
09:00 - 09:10 Welcome and Introduction to Part 1
Patrick Schuh, Airbus DS Electronics and Border Security, Germany

09:10 - 09.40 Active Multiple Feed per Beam SatCom Antennas with GaN SSPA at K-Band
Arne Jacob, Hamburg University of Technology, Germany

09:40 - 10.10 Highly Integrated 20GHz/30GHz OFDM Package ICs for Low-Cost SatCom AESAs
David Corman, Ian Gresham, Anokiwave, USA

10:10 - 10.40 Wide-Angle Scanning Phased Array Antennas at Ka-Band
Tobias Chaloun, C. Waldschmidt, W. Menzel, F. Tabarani, H. Schumacher, University of Ulm, Germany

10:40 - 11:20 Coffee Break

11:20 - 11.50 Modular Panel Array for SatCom-on-the-Move Applications
Patrick Schuh, B. Schweizer, Th. Mueller, A. Mueller, M. Boeck, Airbus DS Electronics and Border Security, Germany

11:50 - 12.20 Techniques and Technologies for SatCom Antenna Systems
Frank van Vliet, S. Monni, M. van Wanum, R. Bolt, TNO, The Netherlands

12:20 - 12.50 Electronically Liquid Crystal-Based Beamsteering Antennas for SatCom-Aplications
M. Jost, C. Weickhmann, O. H. Karabey, H. Maune, R. Jakoby, Technical University of Darmstadt, Germany

12:50 - 13.00 Discussion and Concluding remarks for Part 1

13:00 - 14:20 Lunch Break

14:20 - 14:30 Welcome and Introduction to Part 2
Fabrizio De Paolis, European Space Agency, ECSAT, UK

14:30 - 14:50 Overview of SOTM Aeronautical Terminal Development at ViaSat.
Ferdinando Tiezzi, ViaSat Antenna Systems SA, Switzerland

Kim Gram, Cobham SatCom, Denmark

15:10 - 15:30 Integrating Microwave Components into the Wings of a Remotely Piloted Aircraft.
Joseph Barnard, Barnard Microsystems Ltd, UK

15:30 - 16:00 An Integrated Simulation Approach for SATCOM Phased Array Design.
Marc Rütschlin, CST - Computer Simulation Technology, UK

16:00 - 16:40 Coffee Break

16:40 - 17:00 Why Mechanically Scanned Antennas Have to Cope with a New Generation of Low Profile Aeronautical Terminals?
Raimondo Lo Forti, Space Engineering SpA (Airbus DS group), Italy

17:00 - 17:20 GaN Based, Passively Cooled L-Band SSPA for Avionics.
Suat Ayoz, Honeywell, Czech Republic

Anding Zhu, University College Dublin, Ireland

17:40 - 18:00 Millimetre-Wave Technologies for Next Generation Mobile Terminals.
George Goussetis, Heriot-Watt University, UK

18:00 - 18:20 Open Discussion and Concluding Remarks
WM08
Advances in Millimetre-Wave 3D Printing and MCM Technologies

Organisers:
Kamal K Samanta, AMWT Ltd, UK
Ali A Rezazadeh, University of Manchester, UK

Abstract
In parallel with military applications, recently, the commercial applications of millimetre-wave (mm-wave) frequency bands are growing rapidly, starting from high-speed wireless to radars and medical imaging and sensing. In a mm-wave system, interconnecting parasitics make a circuit/system assembly more complex and costlier than MMIC/MMIC. Multilayer/3D Multi-Chip-Module (MCM) and System-on-Package (SiP/SoP) techniques, in conjunction with additive and subtractive printing techniques, are producing an excellent solution for realizing compact microwave and mm-wave circuits and systems at a low cost and with ever-greater product functionality and reliability. The past decade has seen enormous development in this field, leading to novel and high-quality integrated component and circuit architectures with exceptional performance, flexibility, miniaturization and reliability, and enabling the challenging applications (including wireless comms, biomedical, IoT, energy harvesting and wireless power transfer) feasible and cost-effective. This very timely workshop will feature a range of presentations and will provide a comprehensive overview and understanding on important recent progress and state-of-the-art achievements in 3D/multilayer MCM technologies, including using additive printing (including Aerosol Jet and 3D printing) and subtractive techniques. The presentations will cover from advanced technology and material development to circuit and subsystem realization (including 5G E-band) for challenging microwave and mm-wave applications. The workshop will provide attendees a clear overview of the current and relevant research trends worldwide, in the field of multilayer/3D MCM (LTCC, LCP & IPD) and printing technologies. The workshop will also discuss in detail the major challenges, such as multifunction packaging, energy harvesting/transfer topologies and techniques, flexible platform and morphing/origami-based shape changing modules. It will also cover the very recent advancement in CMOS-based mm-wave smart RFICs for 5G nodes, 3D/2.5D MMICs, and the relative merits and application space for various techniques.

SCM01
The Basics of Travelling Wave Tube Amplifiers

Organisers:
Roberto Dionisio, European Space Agency
Claudio Paoloni, Lancaster University

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, like satellite communication systems and transponders, RADAR transmitters, EMC tester, jammers, etc..

So far solid state electronics is not able to respond to this quest, especially when tens of Watts in the millimetre-wave range are required. Travelling wave tube amplifiers (TWTs) are predicted to remain the only solution for high frequency, wide band and high power amplification in the near future. However, TWTs are "obscure" components for the vast majority of microwave designers.

The Short Course on The Basics of Travelling Wave Tube Amplifiers is conceived to give the attendees understanding of the latest state-of-the-art TWTAs operation with focus on high frequency space applications. It will start providing a summary of the main applications and related requirements impacting the amplifier design and will then address the basic principles of operation of the main functional building blocks with focus on slow wave structures. Then, to facilitate the comprehension of these blocks, the course will present a practical perspective of the application of available design tools. The attendees will be invited in an interactive discussion on all the steps comprising the design of a TWT from the synthesis of the requirements up to the performance verification.
The Application of Automotive Radar - the Further Development Towards Safety Features

Organisers:
Holger H. Meinel, Independent automotive Radar Expert
Juergen Dickmann, Daimler AG, Ulm, Germany

Abstract
Automotive radar has been on the road for several decades. 77GHz LRR and 24 GHz SRR units are produced and installed in millions these days. Even smaller cars are radar equipped today – the democratization process has already taken place (Starting with the introduction of CPA 2.0 at MB in 2012). Until recently automotive radar was employed for increased driving comfort, now a paradigm chance has occurred and it is used to enhance the safety of driving – to reduce the number of fatalities in road traffic. The changing requirements from detection and ranging towards radar based environmental understanding for highly automated and autonomous driving are deduced. The traditional segmentation in driving, manoeuvring and parking tasks vanishes at the driver less stage. Situation assessment and trajectory/manoeuvre planning needs to operate in another way: fast situational up-date, motion prediction of all kinds of dynamic objects, object dimension, ego-motion estimation, (self)-localisation and more semantic/classification information, which allows to put the static and the dynamic world into correlation and context with each other is mandatory. Furthermore, car construction will be changing from passive to active safety in the future. These developments, how they are implemented and how to foster them will be discussed in this workshop.

And – do not forget - radar is only one possible sensor, besides cameras and LIDAR, if we look into the future – to ADAS and autonomous driving. However, due to its very high weather independency radar has to be the backbone.

Programme
14:20 - 14:30 Welcome and Introduction
14:30 - 15:00 Automotive Radar: What to Develop to Meet Future Application
Juergen Dickmann, Daimler AG, Ulm, Germany
15:00 - 15:30 High-Resolution Automotive Radars for Safety Features and Automated Driving Function
Martin Kunert, Robert Bosch GmbH, Leonberg, Germany
15:30 - 16:00 The Evolution From CPA 2.0 to CPA 3.0
Florian Baumgärtner, Daimler AG, Sindelfingen, Germany
16:00 - 16:40 Coffee Break
16:40 - 17:10 Sensor Fusion - Radar and Lidar Combined
Peter Brosseit, Daimler AG, Ulm, Germany
17:10 - 17:40 Towards a Combined Real and Virtual Test Strategy for Radar Based Functions with Respect to ISO 26262 Road Vehicle - Functional Safety
Stefan-Alexander Scheider, University of Applied Science, Kempten, Germany
17:40 - 18:10 Diffusion or Non-Diffusion of Autonomous Driving - that is the Question. The "Step-By-Step" Approach to Foster the Acceptance in our Modern Society
Bela Peterson, Proton Motor Fuel Cell GmbH and Heiko Seif, Munich Business School, Germany
18:10 - 18:20 Open Discussion and Concluding Remarks

Programme
14:20 - 14:25 Welcome
14:25 - 15:05 Advanced and Distributed SAR Imaging Techniques
Pierfrancesco Lombardi, University of Rome "La Sapienza", Italy
15:05 - 15:45 Advanced and Distributed ISAR Imaging Techniques
Debora Pastina, University of Rome "La Sapienza", Italy
15:45 - 16:00 Near Range SAR
Motoyuki Sato, Tohoku University, Japan
16:00 - 16:40 Coffee Break
16:40 - 16:55 GPR and SAR Imaging
Motoyuki Sato, Tohoku University, Japan
16:55 - 17:30 Real - Aperture UWB Imaging
Alex Yarovoy, Delft University of Technology
17:30 - 18:10 mmW and Terahertz Technology
Dirk Nuesler, Fraunhofer HHI, Germany
18:10 - 18:20 Open Discussion and Concluding Remarks
**WW01**

Highly-Integrated Millimetre-Wave Systems for Small-Cell Backhaul Communication Applications

**Organisers:**
Dr. Vadim Issakov  infineon Technologies, Neubiberg, Germany

**Abstract**

The smartphone revolution has led to a growing demand in mobile data traffic which subsequently has resulted in increased throughput per user. The high mobile data requirements have led to the deployment of advanced 4G Long Term Evolution (LTE) networks by the mobile network operators and this is expected to grow further in the coming years with the introduction of the 5G standard. This will provide users with much higher data rates which will increase the data traffic drastically. The increasing data rate puts an enormous burden on the network operator’s backhaul networks. The bulk of today’s base-station infrastructure is not ready to support the required high data throughput using the existing microwave backhaul systems. Though optical fibre based backhaul networks can handle a huge data throughput, they are faced with the challenge of easy and cost-effective deployment. Millimetre-wave frequencies offer additional bandwidth required for high throughput requirements of future networks. E-band (71-76 and 81-86 GHz) provides up to 10 GHz of bandwidth. Additionally, in dense metropolitan area 9 GHz bandwidth in the V-band (57–66 GHz) can be used for small-cell backhaul applications.

The workshop will discuss the application and implementation of mm-wave systems for communications. Five speakers will present different aspects of mm-wave system requirements and circuit design considerations: top level overview of the 5G and backhaul applications; state of the art and beyond state of the art realization of highly integrated transceivers in advanced SiGe and CMOS technologies. Additionally, an outlook into the future mm-wave bands for backhaul communications will be given. A panel organised at the end will discuss issues collected during the talks.

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**Programme**

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<td>09:00</td>
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| 09:10  | **The Trends and Challenge of Microwave/Millimetre-wave in Future 5G Wireless Communication Networks**  
Renato Lombardi, Huawei Technologies,  
Milan Microwave Competence Center, Milan, Italy |
| 09:55  | **Circuits and System Architectures for 100+Gb/s Wireless Backhaul at W-, D- and J-Bands**  
Sorin P. Voinigescu and Stefan Shopov, ECE Department,  
University of Toronto |
| 10:40  | Coffee Break                                |
| 11:20  | **Modular 60-GHz Beamforming Transceiver in 130-nm BiCMOS for Scalable 5G Backhaul Solutions**  
Dietmar Kissinger, IHP, Frankfurt Oder, Germany |
| 11:50  | **Millimetre-wave CMOS circuits for 5G backhaul and access**  
Wim van Thillo, imec, Leuven, Belgium |
| 12:20  | **A V- and E-Band Single-Chip Packaged Transceiver for small-cell Backhaul Applications**  
Saverio Trotta, Samo Vehovc and Vadim Issakov Infineon Technologies, Neubiberg, Germany |
| 12:50  | Open Discussion and Concluding Remarks       |

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Duration: 09:00 to 18:20  Room: 12

WW02
Trends in CMOS RF ICs

Organisers:
Robert Bogdan Staszewski, University College Dublin, Ireland
Gernot Hueber, Affiliation: NXP Semiconductors, Austria

Abstract
With the advent of nano-scale CMOS technology, exciting new developments have recently taken place in the field of RF and mm-wave transmitters, receivers and frequency synthesizers. The low-voltage, fast speed, fine feature-size and low cost of the new technology have forever changed the way we design circuits, architectures and systems. Not only have the RF/mm-wave circuits taken different shapes from what has been taught in textbooks, but also their integration with digital processors have enabled new possibilities for digital assistance, offering autonomous built-in self-testing and self-calibration. This workshop gives an overview and samples of such latest developments.

Programme
09:00 - 09:05 Welcome
Gernot Hueber

09:05 - 09:55 Ultra-Low Power and Ultra-Low Voltage Wireless Transceivers for IoT
Robert Bogdan Staszewski, University College Dublin, Ireland

09:55 - 10:40 Passive Switching Techniques for Pushing Linearity and Selectivity in Advanced RF CMOS
Bram Nauta, University of Twente, The Netherlands

10:40 - 11:20 Coffee Break

11:20 - 12:10 Recent Advances in Radio ICs for Wireless Cubic-mm Sensor Nodes
David Wentzloff, University of Michigan, USA

12:10 - 13:00 Switched-Mode Nanoscale CMOS Power Amplifiers at RF/mm-wave Frequencies
Masoud Babaie, Delft University of Technology, The Netherlands

13:00 - 14:20 Lunch Break

14:20 - 15:10 A Wideband Single-PLL Multi-Channel and Multi-Band Car Radio Receiver with High-Resolution DS ADCs
Lucien Breems, NXP Semiconductors, The Netherlands

15:10 - 16:00 New system concepts stretching the requirements of RFICs
Aarno Pärssinen, University of Oulu; Finland

16:00 - 16:40 Coffee Break

16:40 - 17:30 Highly Integrated Front-End Modules based on Electrical-Balance Duplexers
Barend van Liempd, IMEC, Belgium

17:30 - 18:15 PLLs with ADC-Based TDC and mm-Wave PLLs
Teerachot Siriburanon, Tokyo Institute of Technology, Japan

18:15 - 18:20 Concluding Remarks

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EuMIC 2016
Power Amplifier Design Challenges and Solutions for Millimetre-Wave Radios

Organisers:
Vittorio Camarchia, Politecnico di Torino
Roberto Quaglia, Cardiff University
Matteo Oldoni, SIAE Microelettronica

Abstract
Constant striving towards higher data rates in modern communication systems and the foreseen revolution related to the forthcoming 5G mobile communications are laying the ground for an explosion of the millimetre-wave radio market. The reason? Frequency bands are wider, less overcrowded, and cheaper. Modulation schemes can be relaxed, while very directive antennas can be exploited to realize radio hops of several hundred meters.

On the other hand, the design of all the involved high frequency components is more demanding. The power amplifier, specifically, is a fundamental block of the transmitter for its impact on the overall performance of the entire system and hence poses severe challenges to the designer.

This workshop addresses the peculiar issues involved in the design of power amplifiers in this high-frequency scenario and compares them to the ones confronted with in the traditional microwave bands.

Experts coming from leading groups actively involved in mm-wave PA design will describe and comment upon solutions of choice and real-world examples, both in compound semiconductors (GaAs and GaN) and in Si-CMOS.

Recent Advances in GaN Power HEMTs Related to Thermal Problems and Low-Cost Approaches

Organisers:
Kazuya Yamamoto, Mitsubishi Electric Corp.
Hiroshi Okazaki, NTT DoCoMo R&D Labs.
Kenjiro Nishikawa, Kagoshima University

Abstract
As the market of GaN power HEMTs is growing rapidly, various kinds of technical problems of improving RF performance, thermal conductivity, reliability, cost, etc. are being discussed in major conferences. This workshop introduces and discusses recent advances in GaN HEMTs for microwave applications while focusing on thermal management and low-cost approaches from a viewpoint of actual product use. One reason is that the excellent RF power potential of GaN HEMTs is often restricted by thermal problems. Another reason is that a low-cost approach is one of the most significant key issues in making GaN HEMTs more popular in microwave markets. For these problems, a GaN-on-diamond structure is one of the most promising candidates to solve thermal problems. Plastic packaging techniques, the use of GaN-on-Si HEMTs, and GaN- and GaAs-based hybrid approaches are very effective in reducing the GaN HEMT production cost.

It may seem that such a theme similar to the above topics has already been discussed to date in some conferences. However, it is of great value to GaN PA designers, especially beginners or less-experienced designers, because this workshop allows the attendees to learn and understand the hottest topics and the latest results related to GaN RF power HEMTs at the same time. In addition, the number of GaN PA designers is currently increasing in manufacturers as well as R&D institutes and universities.

In this workshop, these topics, in addition to the fundamentals of GaN HEMT, will be presented by world-leading experts.
**WTh01**

Waveform Engineering in Power Amplifier Design

**Organisers:**
Roberto Quaglia, Cardiff University

**Abstract**
Waveform engineering is an old-school tool for the design of power amplifiers aiming to reach high efficiency. However, recent discoveries in the field of continuous modes, together with the need of combining high efficiency with bandwidth and linearity, have re-boosted the interest of the microwave community on this topic, leading to a substantial number of publications in the field.

This workshop provides an overview on waveform engineering techniques in the design of power amplifiers, and addresses specific hot questions from the microwave community. How do I realize in practice a matching network that engineers the waveform? How does the picture change when the device is saturated? How do I apply waveform engineering to Doherty power amplifiers? Can I simplify my waveform measurements using low frequency approximation?

Recognised experts in the field will provide answers, hints and suggestions on these widely discussed topics.

An appropriate amount of time will be given at the end of each talk to allow interaction between the audience and the presenters. A final 30 minutes round table involving all the presenters will be a further occasion to encourage the exchange of ideas.

**Programme**

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<th>Time</th>
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<tr>
<td>09:00</td>
<td>Welcome</td>
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<tr>
<td>09:10</td>
<td>Clipping Contours: A Tool for Power Amplifier Design</td>
<td>Roberto Quaglia - Cardiff University, UK</td>
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<tr>
<td>09:30</td>
<td>Low Frequency Waveform Measurements: From Theory to Power Amplifier Design</td>
<td>Prof. Paolo Colantonio - Universita Roma Tor Vergata, Italy</td>
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<tr>
<td>10:05</td>
<td>Waveform Analysis in Saturated Devices</td>
<td>Prof. Steve Cripps - Cardiff University, UK</td>
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<td>10:40</td>
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<td>11:20</td>
<td>Design Techniques for the Realisation of Continuous Power Amplifiers</td>
<td>Brian Merrick - University College Dublin, Ireland</td>
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<td>11:55</td>
<td>Waveform Engineering: a Key Concept in Successful Design of Advanced Doherty Power Amplifiers for Wireless Communications</td>
<td>Prof. Slim Boumaiza - University of Waterloo, Canada</td>
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<tr>
<td>12:30</td>
<td>Round Table and Concluding Remarks</td>
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**SCTh01**

Fundamentals of Microwave PA Design

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

**Abstract**
Semiconductor power amplifiers are key components of the circuitry that drives radio frequency 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 amplifier design. The course is an introductory one, aimed at graduate engineers who have moved into the field of RF design.

This short course features a range of presentations and will provide a comprehensive overview and basic understanding on recent important progress and novel state-of-the-art achievements in semiconductor power amplifiers. It will include fundamental concepts and state-of-the-art results on actual designs of a range of semiconductor power amplifiers using existing foundries. The presentations will also cover a variety of advanced topics, and will provide the attendees with a clear overview of the main streams of current and important research trends worldwide in this field. The short course will also focus on the major challenges, such as various non-linearity issues and how to address these in amplifier design. Very recent advances in semiconductor amplifiers and their applications will also be covered.

**Programme**

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<td>09:10</td>
<td>High Performance Semiconductor Devices for Power Amplifiers</td>
<td>Ali Rezazadeh, University of Manchester, UK</td>
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<tr>
<td>09:40</td>
<td>Small and Large Signal Models and Algorithms</td>
<td>Giorgio Leuzzi, Universita dell’Aquila, Italy</td>
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<tr>
<td>10:10</td>
<td>Design Techniques</td>
<td>Gijs van der Bent, TNO, The Netherlands</td>
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<tr>
<td>10:40</td>
<td>Coffee Break</td>
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<tr>
<td>11:20</td>
<td>High Efficiency Power Amplifiers for High Frequency Application</td>
<td>Franco Giannini, Paolo Colantonio, University of Roma Tor Vergata, Italy</td>
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<tr>
<td>11:50</td>
<td>Advanced Concepts for Power Amplifiers in Communication Systems</td>
<td>Paolo Colantonio, Alessandro, University of Roma Tor Vergata, Italy and University of Florence</td>
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<tr>
<td>12:20</td>
<td>IMD Control Issues in Power Amplifiers</td>
<td>Angel Mediavilla, University of Cantabria, Spain</td>
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<tr>
<td>12:50</td>
<td>Open discussion and concluding remarks</td>
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Abstract
The term ‘internet-of-things’ (IoT) was coined by Kevin Ashton in 1999. The central idea was to empower everyday objects with internet connectivity thus enabling pervasive and autonomous communication. The foundation of IoT is based on Weiser’s vision of profound software/hardware technologies that weave themselves into fabric of everyday life such that they become indistinguishable. The functionality and modalities of these technologies is distributed across a variety of interconnected objects. The inter-connectivity of these objects is pivotal as the collective intelligence of the IoT network emerges from simple object level interactions. In turn, such a collective intelligence can be credited with driving significant innovations in the context of various applications under the umbrella of smart homes and cities.

While IoT communication networks will be a corner stone for next generation connected smart cities, a clean slate and smart design is required for these networks. The aim of this workshop is to bring together leading industrial and academic researchers to discuss design issues, challenges and opportunities in the area of IoT communication networks. The workshop program is designed to cross-fertilize research ideas with microwave community. The distinguished invited speakers will highlight specific research challenges to various verticals (transport, health, retail etc.) and will discuss fundamental horizontal design issues.

Programme
09:00 - 09:05 Welcome
09:05 - 10:40 IoT Applications Panel
09:05 - 09:30 Talk #1: The Relevance of RF to Future Health - SPHERE and Beyond
Prof. Ian Craddock, University of Bristol & Toshiba Research Lab, Bristol, UK
09:30 - 09:55 Talk #2: oneTRANSPORT: A Real oneM2M Deployment to Reshape the Transport Sector
Dr. Rafael Cepeda, Interdigital, UK
09:55 - 10:20 Talk #3: IoT in-the-wild: Challenges and Opportunities
Dr. Hamed Haddadi, Queen Mary University, London, UK
10:20 - 10:40 Discussion and Q/A
10:40 - 11:20 Coffee Break
11:20 - 13:00 IoT Technologies
11:20 - 11:40 Machine-to-Machine Trust for the Internet of Everything
Prof. Alan Marshall, University of Liverpool, Liverpool, UK
11:40 - 12:00 5G Radio Access Technologies for Enabling IoT Networks
Dr. Maziar Nekovee, Samsung, UK
12:00 - 12:20 Real World Information Infrastructures Based on the Internet of Things
Dr. Alex Gluhak, Digital Catapult and IoTUK, UK
12:20 - 12:40 Smart Cities in the Age of Big Data and the Internet of Things
Dr. Payam Barnaghi, University of Surrey & 5GIC, Surrey, UK
12:40 - 13:00 IoT Research Outlook: Applications, Deployment Models and Socio-Technical Challenges
Dr. Syed Ali Raza Zaidi, University of Leeds, UK
Dr. Muhammad Imran, University of Surrey, UK
Tracy Keys, Digital Economy Theme, EPSRC
Dr. Alex Gluhak, Digital Catapult UK
Dr. Hamed Haddadi, QMUL, UK
Prof. Alan Marshall, University of Liverpool, UK
Prof. Ian Craddock, Toshiba Research Lab, UK
Dr. Rafael Cepeda, Interdigital, UK
Dr. Maziar Nekovee, Samsung, UK
Dr. Payam Barnaghi, University of Surrey, UK
WF02
Radar Performance in Clutter - Modelling, Simulation and Target Detection Methods

Organisers:
Simon Watts, UCL
Keith Ward, Igence Radar
Maria Greco, University of Pisa

Abstract
The workshop presents the latest advances in clutter modelling for radar and how these models are exploited in radar design and development. Most radars must contend with unwanted clutter returns in addition to those from targets of interest. The ability to characterise and model clutter in a manner that can be exploited by a radar designer is central to most phases of the life cycle of a radar, from initial concept, through design and development and up to final acceptance of a radar into service by a customer. The workshop will provide an overview of the ways in which clutter is modelled and how practical models are developed for use by radar designers. This is a continuously developing field and some of the latest results will be presented.

Clutter models are central to the development of advanced simulations of radar systems, which can be used for applications such as the development of new detection algorithms, the testing of real-time signal processing systems and interactive training systems. The exploitation of clutter models in radar system simulations will be described in the workshop. Finally, the development of detection systems for radar that are robust to all conditions relies heavily on the ability to accurately model the characteristics of targets, clutter and thermal noise. The workshop will describe the latest advances in methods for detection of targets embedded in clutter and noise.

Programme

09:00 - 09:05 Welcome
09:05 - 10:00 Radar Clutter Modelling
Simon Watts, UCL
10:00 - 10:40 Simulation of Clutter
Keith Ward, Igence Radar
10:40 - 11:20 Coffee Break
11:20 - 11:40 Simulation of Clutter (cont.)
Keith Ward, Igence Radar
11:40 - 12:40 Advanced Detection Schemes
Maria Greco, University of Pisa
12:40 - 13:00 Open Discussion and Concluding Remarks

WF03
Millimetre-Wave Technologies for 5G Mobile Networks and Short-Range Communications

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

Abstract
Millimetre-wave (mm-Wave) radio technology is seen as a key enabler for 5G wireless mobile networks and future high data-rate wireless communication systems. They will open access to the wide spectrum resources available from 10 GHz to 100 GHz and even beyond to provide multi-Gbps broadband access to mobile users, high-capacity wireless backbone links between access points/base-stations, and very high data-rate wireless solutions for short-range or long-range applications. These application fields are very active throughout the world with several significant demonstrations already done. Regarding mm-Wave applications in 5G mobile networks, standardization activities have already started in 3GPP and other standardization bodies, while first regulations are expected in 2018 at the 2018 ITU-R World Radio-communication Conference. Systems operating beyond 100 GHz are less mature and very much open to innovation using latest device and manufacturing technologies.

The workshop will include several talks by high-level experts from industry and academia who will present their vision on the role of mm-wave communications in 5G and the main needs/requirement in this domain, state-of-the-art radio and antenna realizations both below and above 100 GHz, and advanced concepts for sub-mmWave and THz communications.

Programme

09:00 - 09:10 Welcome
09:10 - 09:55 5G Mobile Communications above 6 Ghz: Timelines, Key Technologies and Recent R&D
Maziar Nekovee, Samsung R&D, United Kingdom
09:55 - 10:40 User Exposure at Millimetre Waves: Electromagnetic and Thermal Dosimetry in V-Band
Maxim Zhabodov, IETR - University of Rennes 1, France
10:40 - 11:20 Coffee Break
11:20 - 12:10 Cost Effective mm-Wave System Leveraging Silicon Technology and Digital Manufacturing
Cyril Luxey, University of Nice-Sophia Antipolis, France
Frédéric Gianesello, STMicroelectronics, France
12:10 - 13:00 Reconfigurable millimetre-wave transmitarray antennas for backhaul applications
Laurent Dussopt, CEA-LETI, France
13:00 - 14:20 Lunch Break
14:20 - 15:10 Hardware and System Design for Wireless Fibre in the Millimetre-Wave Band
Amin Arbabian, Stanford University, USA
15:10 - 16:00 300 GHz Fixed Wireless Links
Ingmar Kalfluss, University of Stuttgart, Germany
16:00 - 16:40 Coffee Break
16:40 - 17:30 THz Point to Point Links for Back-Hauling in Future Networks
Guillaume Ducourneau, IEMN, France
17:30 - 17:45 Open Discussion and Concluding Remarks
WF04
Fundamentals and Engineering Considerations of THz 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 and lead to new applications with enhanced functionality. 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 and national labs 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 Tunnelling, 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 and applications will also be presented.

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<td>Fundamentals and Latest Results on Nitride-Based Two-</td>
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<td>Planar Nanodiodes for THz Detection and Mixing</td>
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<td>THz Oscillators using Resonant Tunnelling Diodes and</td>
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<td>Rare-Earth-Doped GaAs THz Sources Driven at 1550 nm</td>
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<td>THz Field Effect Transistor Detector Arrays for Postal</td>
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<td>Security Imaging Applications</td>
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<td>Graphene-based THz optoelectronic devices</td>
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<td>High Performance THz Radiation Sources based on</td>
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<td>Plasmonic Photoconductors</td>
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WF04 Workshop and Short Courses - Friday
WF05
Advances in GaN Power Amplifiers: Linearity, Bandwidth and Efficiency

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

Abstract
Emerging microwave applications demand power amplifiers (PA) with ever greater linear power, bandwidth and efficiency, yet at a low cost. The new power systems, like wireless broadcast transmitter, radars (EW), EMC tester, jammers, etc., require the latest state-of-the-art semiconductor in combination with advanced design and integration technologies to deliver optimum performance. GaN is the superior candidate to meet these requirements; since its introduction, it has been creating many records, and there is much more potential to be better understood and utilized.

A GaN transistor delivers the highest level of power density, but owing to the small footprint, GaN PAs are thermally limited much below its capability. As a result, novel and efficient design and biasing technique, thermal management, selection of model/class of operation, etc., play very crucial roles to satisfy the new generation PA requirements. An amplifier operating in Class-A favors linearity and harmonics but suffers from efficiency and thermal load. On the other hand, Class-AB struggles to meet bias stability, gain, and linearity. At the same time, achieving linearization and modulation requirements with an extreme bandwidth for EMC/EW applications; meeting the bandwidth, linearity and efficiency in Doherty at high peak-to-average power ratios (PAPR) for telecom/mobile applications; and overcoming the effect of trapping/memory, raise several technical challenges to address.

This very timely workshop will highlight the important recent advancements in GaN-based circuit design, linearization, and system implementation. Most importantly, the workshop will aware the participants on the critical design issues with hints, technology challenges, and the latest state-of-the-art performance in terms of power, efficiency, linearity and bandwidth, which enabling advanced industrial applications from wireless communication (including LTE and replacement of LDMOS in base stations) to ultra-wideband EMC testers and RADARs. The speakers are the experts and are the leading contributors in both industrial and academic sectors.

Programme

09:00 - 09:10 Welcome

09:10 - 09:55 Design of Highly Efficient and Linear Power Amplifiers by Generalization of the Doherty Theory
William Hallberg*, Mustafa Özen*, Kristoffer Andersson*, David Gustafsson+ and Christian Fager*(Speaker).
*Chalmers University of Technology, Sweden; +Ericsson AB, Sweden

09:55 - 10:40 Doherty Amplifier Optimization Using Offset Line
Prof. Bumman Kim, University of Science and Technology (POSTECH), Korea

10:40 - 11:20 Coffee Break

11:20 - 11:50 Advanced GaN HEMT HPAs With Wider Than Decade Bandwidth
Dr. Kamal K Samanta, AMWT Ltd, UK

11:50 - 12:20 How to Truly Benefit from the Gan Performance Potential?!
Prof Leo de Vreede, Delft University of Technology, The Netherlands
Prof. Allen Katz, Linearizer Technology, Inc.; and Electrical/Computer Engineering at The College of New Jersey, USA

12:20 - 12:50 New Developments in Linearization of GaN Power Amplifiers
Prof. Allen Katz, Linearizer Technology, Inc. and Electrical/Computer Engineering at The College of New Jersey, USA

12:50 - 13:00 Open Discussion and Concluding Remarks
Organisers:
Thomas Zwick, Karlsruhe Institute of Technology
Ian Robertson, University of Leeds
Andy Longford, IMAPS UK

Abstract
Microelectronic packaging technology has advanced tremendously in recent years and microwave, millimetre-wave and terahertz systems can benefit particularly from the ability to integrate diverse active devices (Si, SiGe, GaAs, GaN, InP, etc.) and passive components into a cost-effective module. Millimetre-waves are of immense interest for 5G systems, both for wireless backhaul and for handsets, and 60 GHz band Wi-Fi modules are already available using system-in-package technology with integrated antenna arrays. This workshop will provide delegates with an understanding of a wide range of world-leading research and development that is pushing the boundaries of what can be achieved in terms of high power and high frequency packaging. This includes antenna-in-package techniques, wafer-level packaging, chip-on-chip and 3D stacking, substrate-integrated waveguides and low loss interconnects operating at frequencies up to the hundreds of GHz for wireless communications, short range radar and sensing applications.
WF07
Compact and High Performance Millimetre-Wave and THz Sources & Systems

Organisers:
Edward Wasige, University of Glasgow
Bruce Napier, Vivid Components Ltd
Wolfgang Templ, Nokia Bell Labs
Richard Hogg, University of Glasgow

Abstract
Europe is at the forefront of developing semiconductor-based millimetre-wave (mm-wave) and terahertz (THz) electronic and photonic technology platforms to address societal challenges, such as the ever-growing volume of data for mobile devices such as phones, laptops etc. which will soon require new ultra-broadband (multi-gigabit) wireless communications to easily and effectively access data-rich content, or for machine-to-machine communications as in data centres to handle the large volumes of data. Beyond communications, mm-wave/THz technologies can underpin imaging applications as required for inspection of concealed weapons or sensing applications as required in the identification of biological samples or chemical agents. Consequently, a host of technology options have been proposed for this frequency range, but those based on advanced semiconductor microwave monolithic integrated circuits (MMICs) and on resonant tunnelling diodes (RTDs) are being actively developed.

This workshop will discuss the RTD technology being developed on iBROW (http://ibrow-project.eu), a Horizon 2020 project on front-ends for short-range multi-gigabit wireless links and microwave-photonic interfaces for seamless links to the optical fibre backbone network. The discussions will be underpinned by an industrial perspective from an end-user, especially with regards to technical specifications as well as commercial considerations for future practical mm-wave/THz systems. Latest state-of-the-art results on RTD technology by other researchers including _2 THz oscillators and on the manufacturability of low-cost tunnelling devices will also be presented. Finally, results from other European projects TWEETHER (http://tweether.eu) & M3TERA (https://m3tera.eu) will also be presented. TWEETHER is developing a travelling-wave-tube based W-band technology for a transmission hub for point to multipoint wireless distribution with high capacity, while M3TERA is developing a micromachined (silicon) platform for the heterogeneous integration of terahertz components to enable high data rate short range wireless communications.
WF08
Microwave and Millimetre-Wave Technologies for Medical Diagnostics and Imaging

Organisers:
Panagiotos Kosmas, King’s College London, United Kingdom
Lorenzo Crocco, CNR-IREA, National Research Council of Italy, Institute for Electromagnetic Sensing of the Environment, Italy

Abstract
The application of microwave and mm-wave technologies for medical imaging and diagnostics is an emerging topic within the electromagnetic engineering community. Technological developments in this area have been accelerated by advancements in antenna design and fabrication, computational methods, imaging algorithms, as well as measurement techniques. In parallel to these developments, advances in hardware and increased accessibility of high-frequency technologies has paved the way to novel and very promising medical applications related to this portion of the electromagnetic spectrum.

This workshop features experts from Europe, USA, and China, who will offer the participants an up-to-date overview of recent progress and future perspectives in this field. The workshop presentations and discussions will describe microwave and mm-wave techniques, algorithms, and experiments covering:

- Medical diagnostic sensing, imaging, and monitoring
- Novel antennas and sensors for medical diagnostics
- Contrast-enhanced imaging
- Emerging applications such as communications and sensing at nanoscale

The workshop will be equally beneficial to young scientists and engineers who are interested in acquiring up to date knowledge about this emerging field, as well as academics and professionals who wish to embark on (or are already active in) this area.

Programme
09:00 - 09.20 Welcome and Introduction
09.20 - 10.00 Overview of Current State of the Art for Microwave and Mm-Wave Sensing and Imaging For Medical Applications
Panagiotis Kosmas, King’s College London, UK
10.00 - 10.40 Non-Invasive Glucose Sensing Using Transmission Measurements at 60 GHz
Themos Kallos, Mediwise Ltd UK, United Kingdom
10:40 - 11.20 Coffee Break
11.20 - 12.00 A Micromachined mm-Wave Skin Cancer Sensor: From Technology Development to Clinical Studies
Joachim Oberhammer, Microwave and THz Microsystems, KTH Royal Institute of Technology, Sweden
12.00 - 12.40 Subcutaneous Biosensors for Long-Term Continuous Health Monitoring and Management
Erdem Topsakal, Virginia Commonwealth University in Richmond, Virginia, USA
12.40 - 13.00 Open Discussion
13:00 - 14:20 Lunch Break
14.20 - 15.00 Magnetic Nanoparticles Contrast Enhanced Microwave Imaging
Ovidio Bucci, CNR-IREA, National Research Council of Italy, Institute for Electromagnetic Sensing of the Environment, Italy
15.00 - 15.40 Microwave Imaging for Clinical Monitoring and Follow-Up
Lorenzo Crocco, National Research Council of Italy (CNR) and Institute for Electromagnetic Sensing of the Environment (IREA), Italy
15.40 - 16.00 Open Discussion
16:00 - 16:40 Coffee Break
16.40 - 17.20 THz Channel Characterisation and Modelling for Nano-Scale Communication Networks Aimed at Healthcare Monitoring Applications
Akram Alomainy, Queen Mary University of London, United Kingdom
17.20 - 18.00 From H2020 CIRCLE to COST Action TD1301: Bridging the Gap Between Molecular Communication and Contrast-Enhanced Medical Imaging
Yifan Chen, Southern University of Science and Technology, China
18.00 - 18:20 Open Discussion and Concluding Remarks
WF09
Millimetre-Wave Transmission: Activities of the ETSI ISG MWT

Organisers:
Nader Zein, NEC Europe Ltd
Renato Lombardi, Huawei Technologies

Abstract
Microwave radio has been the main technology for many years in providing mobile backhaul and wireless transport systems and applications. With the increase in demand for capacity the use of mm-wave radio became essential in order to meet the new requirements for mobile and IP networks in the core and access. This increase in demand is estimated to grow at a much higher rate in the next 5 to 10 years to reach 1000 times the current network capacities. The role of mm-wave radio for wireless transport and wireless backhaul will become paramount in order to provide the capacity in the wireless transport network for 5G and future networks. The workshop is presented by the ETSI ISG mWT, whose members include operators, manufacturers and technology providers. The workshop will give some of the activities in the ISG mWT on future higher frequency bands (from 50 GHz up to 300 GHz) for large volume applications in: back-hauling; front-hauling to support mobile network implementation; wireless local loop; and emerging future services benefitting from high speed wireless transmission. The workshop will benefit new engineers and researchers interested in the development of the mm-wave technology and will give them insights into the future demand for mm-wave radio systems and good understanding to the real commercial applications and deployment scenarios.

WF10
Bistatic and Multistatic Radar

Organisers:
Mike Cherniakov, University of Birmingham
Pierfrancesco Lombardo, University of Rome La Sapienza
Debora Pastina, University of Rome La Sapienza
Marco Martorella, University of Pisa
Marina Gashinova, University of Birmingham
Chris Baker, Aveillant Ltd.

Abstract
Bistatic, Multistatic and Netted Radars represent a vibrant research area of modern radar and remote sensing technology. Over the last two decades this technology has been a focus of the worldwide radar community, with great but still not fully discovered potential for target detection, tracking and automatic recognition, as well as wide area surveillance and imaging. The workshop starts by introducing the basics of bi/multistatic/MIMO radar geometries and waveforms, and continues with specific problems of these radars, including real time observation, SAR and GMT modes. Automatic target classification is currently one of the most complex problems of radar technology and a possible solution is in the use of Inverse SAR and specifically Multistatic ISAR. ISAR from the basic to state-of-the-art stage will be discussed during the workshop and Mono and Multi Static ISAR performance will be compared. Since the 1970’s, stealth target detection is considered as the vital problem for defence and Forward Scatter Radar (FSR) is perhaps the only reliable solution for this. Various aspects of FSR will be considered during the workshop. Finally, radar networks, enabling large areas to be covered, are discussed. By this technology a more comprehensive and integrated picture of, for example, aircraft can be created, able to cope with rapidly increasing quantities of air traffic.
WF12
EPSRC Projects in Microwave, Millimetre-Wave and THz Research

Organisers:
Peter Gardner, University of Birmingham, UK

Abstract
To quote from its website: “The Engineering and Physical Sciences Research Council (EPSRC) is the UK’s main agency for funding research in engineering and the physical sciences. EPSRC invests around £800 million a year in research and postgraduate training, to help the nation handle the next generation of technological change.” For several years EPSRC has designated RF and Microwave Devices and RF and Microwave Communications as growth areas, and this policy is manifested in a current portfolio of grants in these areas totaling over £30M. In this workshop, the strategic direction, ambition and vision of EPSRC for RF and Microwave research will be presented and discussed, and a series of talks showcasing a cross section of current EPSRC funded projects will be given.
**Abstract**

The vast majority of high performance radars developed in the last two decades are based on electronic scanned arrays (ESA). Although their design and performance were understood and published in the early part of the 20th century, they only found wide application when government investment and consumer electronics provided the technology base to develop and field low cost high performance systems.

The objective of this short course is to provide an introduction to the theory and application of electronic scanned arrays. The focus will be antenna hardware and specifically radar antennas.

The presentation will describe the general design principles of aperture antennas applied to the specific case of ESA design. System applications will be discussed to set the framework for requirements allocation and flowdown.

ESA performance is largely determined by the selection and limitations of specific components. The presentation will discuss the contribution of radiating elements, T/R modules, monolithic microwave integrated circuits (MMICs), microwave distribution and packaging, to performance goals, including tradeoffs to meet size, weight, power and thermal dissipation constraints. Illustrations from existing satellite ESA systems will be described to illustrate the concepts discussed in the first part of the presentation. The presentation will conclude with a detailed comparison of an L-band system satellite system.

The advantages and disadvantages of ESA and reflector antennas as well as ESA feeds for reflectors will be compared and contrasted. Common ESA design issues will be described, including array partitioning and subarrays, lattice tradeoffs, feed design, causes and mitigation of sidelobes, beam steering approaches and techniques for beam shaping. Numerical examples using Matlab will illustrate performance of specific designs.

**Programme**

**Welcome**
- Antenna Architectures and Functional Partitioning
- Operational Examples
- Conceptual L-band Antennas
- Open discussion and concluding remarks

**Welcome**
- Fundamentals of Multibeam Antennas
- Multibeam Antenna Architectures (Part 1)
- Multibeam Antenna Architectures (Part 2)
- Discussion

**Organisers:**
John S Williams, The Aerospace Corporation
Piero Angeletti, European Space Agency

**Organisers:**
Piero Angeletti, European Space Agency
Giovanni Toso, European Space Agency
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, Satellite and Electronic Warfare Applications
- Material and Component Characterization
- Research and mm-wave/Terahertz Applications
- Printed Circuit Board & RF Circuit Design

If you would like to register to attend any of these workshops and/or book a meeting with a Keysight expert, please visit www.keysight.com/find/eumw2016 where you will also find detailed information on each individual session and a first look at the solutions Keysight will present this year at European Microwave Week 2016.

Tuesday 4th October 13:00 – 17:30

**Radar, Satellite and Electronic Warfare Applications**

Moderated by Darren Nicholls, EMEAI Marketing and Development Manager, Aerospace & Defense

Keysight is the world’s premier test and measurement provider. Using our expertise in metrology, simulation, and related services, we continue our tradition of providing high quality COTS equipment to the aerospace and defense industries. Our mission also remains the same: helping you focus where it counts. Through expertise in measurement science and test processes, we give you more time for the bigger issues: anticipating today’s mission and managing the transition to what comes next. This workshop will explore the available technological approaches for radar, EW signal and environment simulation as well as analysis measurement techniques.

13:00 - 13:45 Real-time Recordings of Wide Bandwidth EW Signals, Event Detection in Post Processing and Pulse Verification.

14:00 - 14:45 Generating Wideband, Multi-channel Radar Signals Using High-speed Arbitrary Waveform Generators

15:00 - 15:45 Enabling Satellite Ground Station Maintenance and Troubleshooting at KA band (26.5GHz to 40GHz)

16:00 - 16:45 Ensuring the Performance of Satellite Systems by Improving Measurement Integrity

17:00 - 17:30 Measuring the Ability of an Airborne Radar to Detect Moving Targets in the Presence of Surface Clutter and Jamming
Wednesday 5th October 09:30 – 13:15
Material and Component Characterization
Moderated by Giovanni D’Amore, EMEAI RF & MW Marketing Brand Manager

Engineers and Researchers working today in education, communications, wireless, aerospace and defence industries with functional, novel materials and their components are faced with increasingly complex measurement challenges and rapidly changing technology. A strong understanding in measurement techniques is essential for success. This workshop is covering the fundamentals of impedance measurements, explain the role of Keysight in material science and component testing, looking at the latest trend for measuring complex multi-function devices in an accurate and repeatable way, to conclude with a look at applications to characterize the electromagnetic properties of the material at microwave and mm-wave frequencies.

09:30 - 10:15 Keysight’s Role in material Science and Components Testing research: an overview
10:30 - 11:15 Advanced Applications for Complete Linear and Non-linear Characterization of Complex Devices
11:30 - 12:15 Devices and Material Characterization from DC to mm-wave and THz
12:30 - 13:15 Advanced Testing Solutions for Impedance measurements

Wednesday 5th October 13:30 – 17:00
Research and mm-wave/Terahertz Applications
Moderated by Giovanni D’Amore, EMEAI RF & MW Marketing Brand Manager

Research often goes beyond scientific discovery to become the discovery of new sciences. As you develop hypotheses, new theorems and theories to expand the world’s knowledge, confidence in measurements is paramount. In research laboratories around the world, Keysight Technologies, Inc. instrumentation and partnership has become an integral part of advanced experimental systems. As the world’s premier measurement company, Keysight works in close collaboration with engineers, scientists, and researchers around the globe to meet the communications, electronics challenges of today and tomorrow. This workshop highlights key research areas in which Keysight is involved such as 5G, IoT and mm-wave and THz application and the solutions that can help you meet your research and development objectives.

13:30-14:30 Exploring the challenge of low current and low power measurements in self-powered and battery powered devices for future wireless applications in IoT infrastructure
14:45-15:45 Generating and Analyzing mmWave Signals for Imaging Radar and Wideband Communications
16:00-17:00 Technology for the Emerging Terahertz Market

Thursday 6th October 09:30 – 11:30
Printed Circuit Board & RF Circuit Design
Moderated by Vincent Launois, EMEAI EEsof Market Development Manager

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 two aspects on how Keysight EDA software helps designers to build first pass correct PCBs & RF/MW circuits.

09:30 – 10:30 New Signal Integrity and Power Integrity tools SIPro & PIPro in ADS 2016
10:45 – 11:30 Silicon RFIC Design Through OpenAccess Interoperability in ADS 2016
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 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 modulation 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 modulation
- Fundamental specifications of RF and microwave generators

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

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 levels. Modulated signals and their envelope characteristics. The final part introduces some power measurement applications in various 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/LAN power sensors - standalone capabilities and applications

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 influences are. We will shed light on the different fading types and 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
- Watterson fading
- The microwave link

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

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

Location: Room 2
Technical Workshops

Tuesday 4th October 2016 11:15 – 12:00

Wideband Pulse Analysis with Digital Oscilloscopes
Pulsed signals are common in many applications such as radar or avionic systems. As the signal bandwidth in advanced radar systems has increased over the years, new measurement quantities as well as requirements on the measurement solutions have evolved. The workshop discusses the measurement solution and analysis feature for wideband and pulsed signals using a digital oscilloscope.

Tuesday 4th October 2016 14:00 – 15:15

Antenna Measurements at the New Test Chamber of Rohde & Schwarz
Rohde & Schwarz develops high-quality microwave measurement equipment, diverse test solutions and antenna systems. High-tech and ever advancing antenna systems require knowledge of 3D radiation characteristics over a wide bandwidth. An anechoic chamber not only enables the use of the near-field measurement technique with subsequent transformation into the far field, it also provides enhanced measurement accuracy and other advantages. The comprehensive Rohde & Schwarz antenna portfolio covers a wide range, including broadband antennas, omnidirectional and directional antennas. An off-the-shelf system cannot cover the diverse measurement requirements. The workshop presents the company’s choice of measurement system – a 14 m x 10 m x 8 m combined near-field/far-field antenna chamber featuring an 8-axis positioning system. It can handle AUTs up to 200 kg and measure an exceptionally wide frequency range of 200 MHz to 40 GHz. Near-field and far-field measurements in the test chamber are shown. The near-field to far-field transformation algorithm based on spherical multipoles and the one based on equivalent currents are introduced. The visualisation of the current distribution close to the aperture of an AUT will be demonstrated. Other techniques such as time gating, probe correction and echo suppression that are used at Rohde & Schwarz to further improve the accuracy of measurements are explained.

Wednesday 5th October 2016 12:30 – 13:15

Ensuring VNA Accuracy Using In-Line Calibration Modules
System error correction using a manual kit or an automatic calibration unit is typical in network analysis, and these calibrators must be screwed onto or unscrewed from the test ports. This involves considerable effort and the danger of operating errors, especially with multiport systems. It also raises the question of how long a calibration is valid, above all if the stability of the setup is affected by many cable glands, long cables or environmental influences. Even in systems with restricted access to the reference level, (re)calibration involves many tasks formerly addressed only by phase noise analyzers can now be covered

Wednesday 5th October 2016 13:30 – 14:15

Millimetre-Wave Measurement Challenges
Measurements at millimetre-wave frequencies are more demanding than at microwave frequencies. In addition to system error correction, active device characterization requires precise power calibration, which is a special challenge for on-wafer testing. The workshop gives an overview of the current status of millimetre-wave solutions, focusing on active device characterization and on-wafer calibration techniques.

Wednesday 5th October 2016 14:30 – 15:15

High-Speed Signal Integrity Measurements
In recent years, data rates for digital applications have continuously increased. Unlike previous generations, where channel tests were optional, today’s digital cables require compliance tests to achieve certification acceptance. An example of this is the evolving USB Type C standard. Previously, most of the compliance parameters were measured with an oscilloscope, whereas now the vector network analyzer is becoming the tool of choice. One of the driving factors in this development is the need for multiprotocol device tests. In this session we discuss the need for precise multiprotocol S-parameter measurements (e.g. crosstalk measurements such as FEXT, NEXT) and the steps involved in performing these. These measurements are the basis of a proper signal integrity analysis and are required for proper eye-diagram and jitter analysis. We will also present different de-embedding methods that counteract the impairments to the measurement results caused by the test fixture.

Wednesday 5th October 2016 15:30 – 16:30

The progress of advanced driver assistance systems (ADAS) is leading to an increasing number of radar systems in the automotive industry. Radar-based ADAS features include adaptive cruise control, pre-crash protection and collision warning systems. The global trend for automotive radars are E-band systems operating at center frequencies between 77 GHz and 79 GHz depending on the geographical region, with wideband modulation using FM chirp waveforms to reach good target resolution. The workshop gives a survey of recent trends in the development of automotive radar systems. A test solution capable of generating and analyzing frequency-modulated continuous wave (FMCW) radar signals in the E-band is presented. This solution uses an ultrawideband chirp sequence modulation with up to 2 GHz bandwidth and demonstrates radar signal analysis and how glitches in the signal can be identified. The following topics are covered:

- Radar waveforms
- Wideband signal analysis
- Automatic detection of hopping parameters
- Automatic detection of chirp parameter
- One-box solution for spectrum analysis up to 85 GHz.

Thursday 6th October 2016 12:30 – 13:15

Advanced Phase Noise Measurement for CW and Pulsed Signals
Accurate and fast phase noise measurements are a common requirement for developing and testing oscillators and synthesizers used in radar and communications equipment. While medium-performance phase noise measurements can be conducted with spectrum analyzers, high sensitivity measurements of a modern low phase noise radar oscillator requires the use of a dedicated phase noise test set. In the case of pulsed signals or the additional requirement for additive phase noise measurements, setting up and calibrating these test sets can be a very complex task. The workshop reviews the fundamental concepts of measuring phase noise and introduces a new technique that provides state-of-the-art measurement sensitivity and speed for phase noise measurements. The combination of very good internal reference signal sources, high-performance analog-to-digital converters and signal processing creates a measurement tool for all needs of modern phase noise measurements, including CW and pulsed phase noise, additive phase noise and AM noise.

Thursday 6th October 2016 13:30 – 14:15

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.
National Instruments Workshops

- Free to attend -

Location: Room 6

Tuesday 4th October 12:00 – 16:00

**AWR Design Forum (ADF) / NI AWR Software User Group Meeting**

Overview:

ADF – in conjunction with NI AWR Design Environment User Group Meeting - is scheduled for Tuesday, 4 October. Spend time to learn about NI solutions 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 NI AWR Design Environment™ product portfolio of Microwave Office, Visual System Simulator™, AXIEM, Analyst™ and AntSyn™ as well as co-simulation with LabVIEW. Customers and partners will also be presenting how they use these software solutions to realize end product design.

Agenda:

12:30 - 13:00 Antenna Synthesis Capabilities and Preview of New Features
Andrew Wallace, AWR Group, NI

13:00 - 13:30 Advanced GaN Transistor Modelling for High Power MMICs
Dr. Jonathan Leckey, MACOM

13:30 - 14:00 GaN MMIC and Packaging Design at Thales UK
Rashed Fazaldin, Thales

14:00 - 14:15 Coffee Break

14:15 - 14:45 System Level Simulation Using Simplified MHV PA Model
Dr. Tony Gasseling, AMCAD Engineering

14:45 - 15:15 A New Nonlinear Modeling Approach for the Analysis of Massive MIMO and Phased Array Transmitter Impairments
Dr. Christian Fager, Chalmers University

15:15 - 15:45 A Cooperative Software and Measurement Framework for RF PA Design and Linearization
Geneviève Baudoin, ESIEE

15:45 - 16:00 Closing, Raffle and Q&A

16:00 - 17:00 Happy Hour at NI booth #4

To view the complete agenda and to register, visit: www.awrcorp.com/eumw2016

Wednesday 5th October 14:00 – 17:00

**Hands-on: Rapid Prototyping of Real Time Wireless Systems**

In today’s competitive wireless research space, the ability to prototype ideas quickly on hardware using real signals is more important than ever. Attendees will gain hands-on experience with National Instruments’ integrated hardware and software platform for rapid prototyping of real-time wireless systems using the NI LabVIEW Communications System Design Suite (LabVIEW Communications) and the NI USRP RIO FPGA-based software defined radio. The final result will be the attendee’s ability to design, simulate, and prototype a 5-MHz LTE-based real-time OFDM link on a high performance FPGA, and transmit data over the air using the link designed on the NI USRP RIO. This industrial design workshop will cover the most important aspects of the idea-to-prototype flow in a single tool, including floating-point simulation, floating-point to fixed-point conversion, HW/SW partitioning, performance-complexity tradeoffs, and finally verification and testing on an FPGA-based software-defined radio. Note: No prior experience with FPGA’s or NI hardware or software tools is required.

To register, please visit: http://uk.ni.com/eumw
National Instruments SPONSORED Workshops

- Free to Attend -

- Course Completion Requires Full Day Attendance -

Location: Room 6

Thursday 6th October 09:30 - 16:00

From Bits to Waves: Building a Modern Digital Radio in 1 Day

Overview:
In this fun and interactive workshop hosted by Dr. David Ricketts of North Carolina State University, participants will learn the basic theory of modern digital radios as well as the RF circuits and system used to build them. After an introductory session on digital radios, participants will select an RF building block to design and build. There will be short mini-classes (run in parallel) on each component: double balanced mixer, microstrip filters, low noise amplifiers, power amplifiers, baluns, etc. The radios will operate in the ISM 920 MHz band. After the mini-classes, each participant will design their RF component using NI AWR software. In the afternoon, the designs will be transferred to PCB via a simple "PCB in a bag" method and each component built and tested using a simple VNA. The workshop will conclude with a full radio test of at transmitter and receiver.

To view the complete agenda and to register, visit: www.awrcorp.com/eumw2016

EuMW MICROAPPS 2016

- Free to attend -

Welcome to the sixth annual European Microwave Week Microwave Application Seminars (MicroApps). MicroApps will be held from Tuesday, 4 October through to Thursday, 6 October 2016. MicroApps are sponsored by National Instruments, Rohde & Schwarz and Horizon House and will take place in the MicroApps Auditorium (stand 17), which is located within the exhibition floor making it a convenient stop while attending EuMW.

MicroApps allow EuMW exhibitors to 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 presentations provide engineers with insight into products and techniques that aim to aid them with their everyday work.

Sponsored by:

MICROAPPS 2016 London

MicroApps Highlights

- A wide range of practical application topics describing novel products and processes.
- Keynotes presented by leading industry persons.
- Exhibition Only Badges or Conference Badges provide for free access.
- Complimentary USB containing all presentations.

We look forward to seeing you at EuMW MicroApps 2016 (stand 17)!

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 - Monday

<table>
<thead>
<tr>
<th>Room</th>
<th>09:00-10:40 Coffee Break</th>
<th>11:20-13:00 Lunch</th>
<th>14:20-16:00 Coffee Break</th>
<th>16:40-18:20</th>
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<tbody>
<tr>
<td>Room 7</td>
<td>EuMIC04 OPENING SESSION</td>
<td>EuMIC05 GaN Devices</td>
<td>EuMIC11 Graphene &amp; III-V Devices</td>
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<tr>
<td>Room 8</td>
<td>EuMIC06 Millimetre-Wave Low Noise Amplifiers</td>
<td>EuMIC12 Millimetre-Wave Transceiver Components</td>
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<td>Room 9</td>
<td>EuMIC07 Millimetre-Wave and THz Transceiver Components</td>
<td>EuMIC13 VCOs and Synthesizers</td>
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<td>Room 10</td>
<td>EuMIC01 Si-based Transceiver Building Blocks</td>
<td>EuMIC08 CMOS Based Transceiver Components</td>
<td>EuMIC14 GaN Power Amplifiers</td>
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<td>Room 11</td>
<td>EuMIC02 High Efficiency and Linear Power Amplifiers</td>
<td>EuMIC09 Doherty and Envelope Tracking Amplifier Solutions</td>
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<td>Room 12</td>
<td>EuMIC03 Novel Characterization Techniques for Microwave Devices</td>
<td>EuMIC10 Modelling of Thermal and Trapping Effects in HEMTs</td>
<td>EuMIC15 Device Modelling of Microwave FETs</td>
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<td>Room 2</td>
<td>WM01 Recconfigurable RF &amp; Microwave Passive Components for Emerging Wireless Systems</td>
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<td>Room 3</td>
<td>WM02 Millimetre-Wave Electronics for High Capacity Wireless Networks</td>
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<td>Room 4</td>
<td>WM03 Additive Manufacturing for RF Passive Hardware</td>
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<td>Room 6</td>
<td>WM04 Wireless Power Transmission for Space Applications</td>
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<td>Room 14</td>
<td>WM05 Microwave Passive and Active Devices with Integrated Filtering Functions</td>
<td>WM08 Advances in Millimetre-Wave 3D Printing and MCM Technologies</td>
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<td>Room 15</td>
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<td>SCM01 The Basics of Travelling Wave Tube Amplifiers</td>
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<td>Room 16</td>
<td>WM06 Current and Future Use of Spectrum by PMSE - 3rd PMSE Workshop at EuMW</td>
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<td>Room 17</td>
<td>WM07 New Developments for Satellite Communications on the Move</td>
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**Conference Centre**

- EuMW
- EuroMic
- Joint EuMC/ EuMW
- Joint EuMC/ EuMIC
- Joint EuMC/ EuRAD
- Joint EuMC/ EuRAD
# Conference Sessions Matrix - Tuesday

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<tr>
<th>Room</th>
<th>09:00-10:40</th>
<th>Coffee Break</th>
<th>11:20-13:00</th>
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<td>Room 7</td>
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<td>EuMC03 IoT, UWB and Wireless Sensor Networks</td>
<td>EuMC05 Millimetre-Wave Antennas</td>
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<td>EuMC04 Systems and Applications I</td>
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<td>EuMC19 Millimetre-Wave Signal Generation</td>
<td>EuMC20 CLOSING SESSION</td>
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<td>Room 1</td>
<td>EuMC/EuMC01 Special Session: ARMMIS RF and Microwave Society Selected Papers</td>
<td>EuMC/EuMC03 THz Photonics Electronic Components and Systems</td>
<td>EuMC07 Lossy and Multi-Band Filters</td>
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<td>Room 4</td>
<td>EuMC01 Waveguide and SW Components</td>
<td>EuMC/EuMC04 Components for Receivers</td>
<td>EuMC08 Advanced 5G Technologies</td>
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<td>Room 13</td>
<td>EuMC/EuMC02 RF MEMS Components and Packaging</td>
<td>EuMC/EuMC05 Multi-Functional Tuneable Filters for Wireless Applications</td>
<td>EuMC09 Novel Electromagnetic Techniques for Microwave Components</td>
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<td>Room 14</td>
<td>EuMC16 CMOS and BiCMOS Power Amplifiers</td>
<td>EuMC/EuMC06 Packaged and Integrated High-Power Amplifiers</td>
<td>EuMC10 Digital Predistortion</td>
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<td>Room 15</td>
<td>EuMC17 Novel Modeling Techniques for Microwave Circuit Design</td>
<td>EuMC/EuMC07 Packaging and Multi-chip Modules</td>
<td>EuMC11 Passive Couplers and Dividers</td>
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<td>Room 16</td>
<td>EuMC02 Antenna Substrates</td>
<td>WTu01 The Application of Automotive Radar – The Further Development Towards Safety Features</td>
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<td>Room 17</td>
<td>EuMC18 High Power and TR Modules - GaN Based Components</td>
<td>WTu02 Radar Imaging - VHF to THz</td>
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<td>Exhibition Hall</td>
<td>EuMC Poster01</td>
<td>Welcome</td>
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## CONFERENCE SESSIONS MATRIX - WEDNESDAY

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<td>09:00-10:40</td>
<td>Coffee Break</td>
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**Attendees:**

- EuMC
- EuMW
- EuMIC
- EuRAD
- Joint EuMC/ EuMW
- Joint EuMC/ EuMIC
- Joint EuMC/ EuRAD

**Conferences:**

- EuMC (European Microwave Conference)
- EuMW (European Microwave Week)
- EuMIC (European Microwave Integrated Circuits Conference)
- EuRAD (European Radar Conference)

**Events:**

- WW01: Highly-Integrated Millimetre-Wave Systems for Small-Cell Backhaul Communication Applications
- WW02: Trends in CMOS RF ICs
- WW03: Towards 0.7 THz SiGe HBT Technology – the DOTSEVEN Project
- WW04: Power Amplifier Design Challenges and Solutions for Millimetre-Wave Radios
- WW05: Recent Advances in GaN Power HEMTs Related to Thermal Problems and Low-Cost Approaches
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Note: All Exhibitor Workshop rooms are located within the conference area on Level 3
European Microwave Week

Venue overview

ICC Capital Suite - Level 3
- Rooms 1-17
- Exhibitor Workshops: Rooms 2, 3 & 6
- EuMC Plenary: Rooms 7-12
- Poster panels (Monday & Friday)
- Coffee breaks (Monday & Friday)
FLOOR PLAN

ExCeL London

Prince Regent for ICC London

Conference Centre

Entrance

East Entrance

Registration
Exhibition Entrance
Delegate Bags

Exhibition Halls
S20 - S23

South Event Halls
S20 - S23
Poster panels (Tuesday – Thursday)
Coffee breaks (Tuesday – Thursday)
MicroApps – S20

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