# Commission B, Fields and Waves
# Activity Report
# March 2014 – July 2014

## 1 iWAT 2014

**2014 International Workshop on Antenna Technology**

The International Workshop on Antenna Technology (iWAT) is an annual forum for the exchange of information on the research and development of innovative antenna technologies. There are two tracks at iWAT, the invited track and the interactive track. All the presentations in the invited track are delivered by prominent researchers, and the presentations in the interactive track were delivered by oral presentations. Celebrating its tenth anniversary, iWAT2014 was held at Four Points by Sheraton, Darling Harbour, Sydney.

### 1.1 Statistics

Date: March 4–6, 2014
Venue: the Four Points by Sheraton Sydney, Darling Harbour, Sydney, Australia
Web Page: http://www.iwat2014.org/index.php
Invited Talks: 38
Oral Talks: 129
Poster Talks: 0

### 1.2 Technical sessions

- Small Antennas
    1. Adaptive (smart) arrays
    2. Antennas on/in IC packages
    3. Arrays
    4. Broadband antennas
    5. Conformal antennas
    6. Embedded antennas
    7. MEMS/Nano technology for antennas
    8. Millimeter Wave and THz antennas
    9. Modeling and simulations
    10. Miniaturization of antennas
    11. Non-Foster/active elements
    12. Nano-antennas
    13. Reconfigurable antennas
    14. Reflect arrays
    15. Ultra-wideband (UWB) antennas
- Innovative Structures and Materials
    1. Analysis and design of EM materials

2. Artificial magnetic conductors (AMC)
3. Bi-anisotropic materials
4. Electromagnetic anisotropy
5. Electromagnetic bandgap (EBG)
6. Fractal structures
7. Frequency selective surfaces (FSS)
8. Novel features of EM materials
9. Single and double negative metamaterial
10. Superconducting material

- Applications

1. Automotive systems
2. Bluetooth/W-LAN (PDAs, laptops)
3. Body-centric wireless communications
4. GPS systems
5. Medical applications
6. MIMO systems
7. Mobile wireless systems
8. Power harvesting
9. RFID/Sensors
10. UWB communication and radar systems
11. Wireless communication systems

- Handheld Devices, Base Stations

1. Radar systems
2. mm-Wave/ TeraHertz communications and imaging
3. Satellite communications
4. EMC

# 2 EuCAP 2014

**The 8th European Conference on Antennas and Propagation**

EuCAP 2014 is the 8th European Conference on Antennas & Propagation organised by the European Association on Antennas and Propagation (EurAAP) since 2006. The previous successful editions took place in Nice, Edinburgh, Berlin, Barcelona, Rome, Prague and Gothenburg. The average attendance is around 1000 delegates.

EuCAP is supported by the top level Associations in Antennas and Propagation, thus fostering true collaboration at European and global levels. The conference combines a diversity of formats:

- Plenary sessions with invited keynote papers
- Oral sessions (both convened and contributed)
- Posters (presented in same central area as the exhibition)
- Workshops, short courses
- Exhibition (in large hall in the center of everything)

## 2.1 Statistics

Date: April 6–11, 2014
Venue: World Forum in The Hague, The Netherlands
Web Page: http://www.eucap2014.org/
Invited Talks: 12
Oral Talks: 732
Poster Talks: 365

## 2.2 Technical sessions

- New Antenna Systems Involving Metamaterials and Metasurfaces
- Microfluidic Technology for Flexible and Reconfigurable Antennas
- Theory and Applications of Magnetodielectric Materials in Antenna Design
- Medical and Biological Applications of EMF
- Millimetre‐Wave, Submillimetre‐Wave and TeraHertz Antennas
- Indoor Channels and Systems
- Memorial Session for Professor Pertti Vainikainen
- Reflector, Feed Systems and Components
- Tropospheric Propagation
- Radio Climatolog
- Imaging and Inverse Scattering
- Multiple‐Beam Antennas, Beamforming and Data Processing
- Ultra‐Wideband Antennas and Time‐Domain Techniques
- Passive, Multiband and Small Antenna Element
- Antenna Measurement Techniques
- Multiple Beam Antennas
- Theory and Applications of Graphene in Antenna and Microwave Engineering
- Integral Equations in Electromagnetics
- Medical and Biological Applications of EMF 2
- Antennas and Propagation in Wireless Efficient Smart Buildings
- Modelling Propagation for Millimetre‐Wave Wireless Communications
- Frequency and Polarisation Selective Surfaces
- Array‐Antenna Design and Technology
- Satellite Tropospheric Propagation
- Phased Array Systems for Defence Applications
- Mm‐Wave Antenna Systems
- Slotted‐Wave, Guided‐Wave and Leaky‐Wave Antennas
- Emerging Techniques for Multiband and Wideband Antennas
- Body Centric Issues
- Tropospheric Channel

- Antenna and RF Material Characterization Techniques and Facilities
- Reflector, Feed Systems and Components
- Millimetre‐Wave, Submillimetre‐Wave and TeraHertz Antennas
- Antenna Systems and Architectures
- Advanced RF Materials, Metamaterials and EBG
- Analytical Methods and Numerical Techniques in Electromagnetic Theory
- Metamaterials
- Some New Perspectives in Metamaterials
- Square Kilometer Array
- Compressive Sensing in Electromagnetics
- Wideband Channel Modelling for Satellite and Aeronautical Communication Links
- Slotted‐Wave, Guided‐Wave and Leaky‐Wave Antenna
- Pulsed‐Field Radio: Potentialities and Implementation
- Analytical Methods in Electromagnetic Theory
- Electromagnetics in the Medical Arena: Therapeutic Applications
- Antennas and Propagation Challenges in Short Range Radio Application
- Ray Tracing Deterministic Modelling for Future Wireless Systems
- Reflectarrays and Transmitarrays
- Multipactor, Passive Intermodulation and Corona in Antennas
- Array‐Antenna Analysis and Synthesis
- AMTA/EurAAP Measurements/Automotive, Telematics and Defense Antenna Testing
- Novel Advances in Reconfigurable Systems
- Wearable Antennas
- Electromagnetic Energies, an Emerging Tool in Computational Electromagnetics
- Reflectarrays, Transmitarrays and FSSs
- Fabrication of Fabric Based Frequency Selective Surfaces (FSS)
- Beamforming and Signal Processing
- Adaptive and Reconfigurable Antennas
- Wire Antennas, Baluns and Associated Circuits
- Array Antennas
- Antenna Interaction, Coupling and RCS
- Slotted‐Wave, Guided‐Wave and Leaky‐Wave Antennas
- Terahertz and Optical Antennas
- Parallel Time Domain Solvers for Electrically Large Transient Scattering Problems
- Mobile Channel Modelling
- Propagation Channel Modeling for Wideband Radio Systems
- Mobile Channel Modellin
- Ray Tracing Propagation Modelling: Future Prospects

- Advanced Design and Optimization Techniques for Phased Arrays
- Body Centric Propagation
- Multiband and Wideband Antennas
- Advanced RF Materials, Metamaterials and EBG
- Satellite and Aerospace Antenna Testing
- Land Mobile Satellite Channels
- Scattering, Diffraction and RCS
- Antenna Interaction and Coupling
- Domain Decomposition Methods and Macro‐Basis Functions for Integral Equations
- Advanced RF Materials, Metamaterials and EBG
- Low Exposure in Mobile and Wireless Communications Systems
- MIMO, Antenna Diversity, Smart and Signal Processing Antennas
- Adaptive and Reconfigurable Antennas
- Antennas and Receivers for Astronomy and Cosmology
- On‐the‐Move Antenna Systems
- Measurements/Antenna Diagnostics and Post Processing
- THz Enabling Technologies and Application
- Multiband and Wideband Antennas
- Ionospheric Propagation
- Mobile Propagation
- Active and Integrated Antennas
- Modulated Metasurface Antennas
- Data Domain Modelling for Antenna Analysis and Design
- Scattering, Diffraction, RCS Measurement and Processing
- MIMO, Antenna Diversity, Smart and Signal Processing Antennas
- RF Sensors, RFIDs and Power Scavenging
- Active Antennas, Integrated Antennas, Lens Antennas and Radomes
- Mobile and Ionospheric Channels
- Ultra‐Wideband Antennas and Time‐Domain Techniques
- Multiband, Wideband, Electrically Small and Dielectric Resonator Antennas
- Advanced Applications
- Resonant Optical Antennas
- Antenna Measurements (AMTA)
- Technology‐Based Analysis of Probe Array Systems for Rapid Near‐Field Imagery and Dosimetry
- Antenna Measurements (AMTA)
- Nano Antennas
- Electromagnetic Theory and Numerical Techniques
- Multiband and Wideband Antennas

- Propagation for Small Cell Deployment
- Non‐uniform Arrays ‐ from Concepts to Implementation
- Dielectric Resonator Antennas
- Imaging and Diagnostic Measurement Techniques and Algorithms
- Lens Antennas & Radomes
- MIMO, Antenna Diversity, Smart and Signal Processing Antennas
- Antenna Systems and Architectures
- Millimetre‐Wave, Submillimetre‐Wave and TeraHertz Antennas
- Numerical Techniques in Electromagnetic Theory Session type: Regular Application track: Fundamental Research Room: Mississippi
- Antennas & Propagation for Body Environments
- Cellular Urban Propagation
- Channel Measurements and Models for Cognitive Radio Applications
- OTA Measurements of Wireless Devices
- Realism in Existing MIMO OTA Test Methods
- Antennas for Radio Astronomy and Space Applications
- Space‐Time Channel Models for Earth‐Space and UAV Links
- Advances in Measurement Implementations
- Data Acquisition, Imaging Algorithms and Processing Methods
- Applications of Antennas and Propagation to Mining and Geoscience
- Array‐Antennas Analysis and Synthesis
- RF Sensors
- Passive, Multiband and Small Antenna Elements
- Software Parallelization, High Performance Computing and Cloud Computing Efforts in Electromagnetics

# 3 IEEE APS 2014 and USNC-URSI 2014

**The 2014 IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting**

The 2014 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting was held jointly July 6–11, 2014, at the Memphis Cook Convention Center in Memphis, Tennessee, USA. The symposium and meeting are cosponsored by the IEEE Antennas and Propagation Society (AP-S) and the U.S. Committee of the International Union of Radio Science (USNC-URSI) Commissions A, B, C, D, E, F, G, and K. The joint meeting was intended to provide an international forum for the exchange of information on state-of-the-art research in antennas, propagation, electromagnetics, and radio science.

### 3.1 Statistics

Date: July 6–12, 2014
Venue: Memphis, Tennessee, USA.
Web page: http://www.2014apsursi.org/
Total Session Number: 177
Oral Presentations: 1400
Poster Presentations: 180
Short Course: 13

### 3.2 Technical sessions

- Computational Modeling of Stochastic Uncertainty in Electromagnetic Components and Systems
- Methods and ApplicationsAdditive Manufacturing in Antenna Technologies
- Novel Metamaterial Surfaces and Related Physical Phenomena
- Antenna Analysis, Design, and Optimization
- Antenna Design and Optimization
- Nano-enabled Antennas and EM Devices
- mm-Wave Antennas and Systems
- Techniques in Electromagnetic Theory
- Advances in Antenna Arrays
- Propagation and Remote Sensing in Complex and Random Media
- Microwave Imaging Techniques
- Communication Systems and Sensor Networks
- Medical Applications of Antennas
- Finite-Difference Methods
- Tomography and Imaging
- Antenna Metrology
- Complex and Artificial Electromagnetic Analysis and Design - In Honor of Professor Mario Sorolla
- Electromagnetic Properties of Structured Surfaces
- Broadband Wires, Slots, Horns, and Lenses
- Printed UWB Antennas
- Slotted Waveguide Antennas and Arrays
- Novel Antenna Structures
- Volumetric Electromagnetic Materials
- Wideband Arrays
- Propagation in Underground Environments
- Atmospheric and Ionospheric Propagation Characterization
- Antennas for Mobile Communication Applications
- Miniaturization of Antennas
- Advanced Antenna Measurements

- Antenna Design and Optimization Techniques
- Wearable and Implantable Antennas
- 3D/Additive and Inkjet-Printed Antennas
- Guided-Wave Metamaterial Structures
- Small Antennas for Mobile Platforms
- Antenna and System Design for Wireless Communication
- Advances in Antenna Feed Circuits and Structures I
- Atoms, Antennas, Materials: Metrology and Imaging
- MIMO Communication and Radar Systems
- Propagation Modeling and Measurements
- Medical Imaging and Sensing
- Finite-Difference Time-Domain Methods I
- Hybrid Numerical Methods
- Millimeter Wave Small Antennas
- Broadband Dual-polarized and CP Printed Antennas
- Metamaterial Antennas and Applications
- Dielectric Resonator Antennas from Non Conventional Material
- Dielectric Resonator for MIMO Applications and Arrays
- Optimization Driven Design Ballroom B-E
- Enhancement of Dielectric Resonator Antenna Characteristics
- Wideband Dielectric Resonator Antennas
- Reconfigurable and Foldable Antennas
- Wireless Power Transfer
- Broadband Fractal and Metamaterial-based Antennas
- Advances in the Development of Diagnostic and Therapeutic Microwave Systems I
- A History of the Society and Its Technology
- Antennas Loaded With Metamaterials
- Non-traditional Reconfigurability, Tuning, and Steering Methods
- Designing Small Antennas
- Vehicular Antennas and Communications
- Antenna Theory and Design
- Advanced Materials and Metrology
- Advances in Antenna Feed Circuits and Structures II
- Inverse Scattering and Imaging I
- MIMO Antennas for Mobile Devices
- Propagation Channel Emulation and Characterization in Complex Environments
- Propagation Channel Characterization for On-Body Networks
- Finite-Difference Time-Domain Methods II

- Advanced and Hybrid Method of Moments Techniques
- Design and Optimization of Antennas and Antenna Components
- Novel Analytical and Numerical Techniques for Electromagnetics
- Numerical Methods for Antennas
- Fast Methods
- Millimeter-wave Lenses and Beam Shaping Applications
- Algebraic and Kernel-Dependent Solvers for Integral Equations
- Transformation Electromagnetics and Graded Metasurfaces
- Tunable and Multiband Antennas I
- Reflectarray and Array Elements
- Emerging Antenna Concepts for UWB Systems
- Antenna Theory, Design, and Measurements
- Inverse Scattering and Imaging II
- Graphene, Carbon Nanotubes, and Nanowires
- Outdoor Propagation Channels for Mobile Communications
- Antennas for Biomedical Applications
- EM Noise and Wireless Power Transfer
- Characteristic Mode Analysis: Theory and Applications
- Education and Simulation Tools
- Sub- and Super-strates for Phased Arrays
- Frequency Selective Surfaces I
- Frequency Selective Surfaces II
- Fabry-Perot Resonator Antennas
- Reconfigurable Frequency Selective Surfaces
- Antennas and Sensors for Body-Centric Applications
- Inkjet-Printed Antennas
- Materials and Propagation Measurements
- Phased Array Design and Characterization
- Antennas and Sensors for Unmanned Air Systems
- Multi-Scale and Multi-Physics Solvers I
- Metamaterial Structures for EM and Acoustics
- Tunable and Multiband Antennas II
- Beamsteerable Reflectarray and Reflectarrays working at mmW, THz, or Infrared
- Slotted and Guided Wave Antennas I
- Microstrip Antenna Arrays
- Inverse Scattering and Imaging III
- Multi-Antenna Systems for Wireless Communications
- Indoor Propagation Channels for Wireless Communications

- RF and Microwave Medical Devices Design and Exposure Analysis
- Guided Waves and Waveguiding Structures
- Pixelated and Switchable Antennas
- Advances in the Development of Diagnostic and Therapeutic Microwave Systems II
- Applications of Phased Arrays
- Advances in Integral Equation Modeling
- Integral Equations
- Integral Equations for Scattering Analysis
- Volume Integral Equation Methods
- Fast and Efficient Integral Equations
- Materials for Printed and Microstrip Antennas
- Electromagnetic Dosimetry and Exposure Assessment
- Phased Array Calibration and Near Field Sampling
- Antenna, System, and Spectrum Sharing Issues in Cognitive Radio and Cognitive Radar
- Localized Waves: Theory, Experiment, and Applications
- Active, Non-reciprocal or Non-linear Metamaterials
- Frequency Reconfigurable Antennas
- Slotted and Guided Wave Antennas II
- RFID Sensors and Systems
- Log Periodic and Spiral Antennas
- RF and Microwave Systems for Wireless Power Transmission
- Microstrip Antennas and Printed Devices
- Novel Circuits, Structures, and Materials
- Phased Array Synthesis and Beamforming
- Numerical Methods and Acceleration Algorithms
- Multi-Scale and Multi-Physics Solvers II
- Transmit Array
- Ultra Wideband Antennas and Arrays
- Fast Integral Equation Solvers
- Novel Integral Equation Formulations
- Preconditioners and Stable Discretizations for Integral Equations
- Reflector and Lens Antennas
- Wideband and Multiband Antennas
- Wireless Power Transfer Systems, Challenges, and Applications
- Theory of Characteristic Modes for Antenna System Design in Wireless Communications
- Pattern Reconfigurable Antennas
- Reflector Antenna
- Slotted and Guided Wave Antennas III

- Antennas for RFID Systems
- Electromagnetic Interaction and Coupling
- Antenna Near Field and Mutual Coupling
- Propagation and Scattering in Random or Complex Media
- Wideband Printed Antennas
- Propagation Phenomena and Effects
- Exotic Scattering Features of Metamaterials
- Metamaterial Structures for Antenna Enhancement
- Nanoscale Electromagnetics I
- Accelerated Computing Methods for Numerical Electromagnetics I
- High Frequency and Asymptotic Methods I
- High Frequency and Asymptotic Methods II
- Domain Decomposition and New Developments in Finite Element Analysis
- Time-Domain Finite Element and Discontinuous Galerkin Methods
- NanoScale Electromagnetics II
- Layered Band Gap Antennas
- Devices and Methods for Remote Sensing
- Accelerated Computing Methods for Numerical Electromagnetics II
- Novel Antenna Systems for Space and Ground Applications
- Numerical Weather Prediction Supporting Electromagnetic Wave Propagation Modeling
- Complex Materials and Non-Foster Circuits for Antenna Radiation, Scattering and Measurement Control
- Reconfigurable Arrays
- Innovative Antenna Designs
- Frequency Selective Surfaces and Metasurfaces
- Estimation and Detection
- EM and EMC Metrology
- Printed Circuits and Front-Ends
- Printed and Planar Antennas
- Antenna Arrays
- Time-Domain Methods
- Remote Sensing of the Earth
- Advances in RFID Sensing
- EBG and Terahertz Radiating Elements
- Theoretical Electromagnetics
- Wireless Communication Devices and Propagation
- Time-domain Arrays for Innovative Communication and Sensing Systems
- Electromagnetic Band Gap Structures

- Adaptive, Active, and Smart Antennas
- Antenna Theory and Measurements
- Scattering and Diffraction
- Ultra Wideband Antennas
- Printed Antenna Applications
- Microstrip Antennas
- Wideband, Multiband, and Circularly Polarized Microstrip Antennas
- Numerical Methods for Transient Phenomena
- Biomedical Imaging and Detection
- Terahertz Antennas, Systems, and Interconnects
- Arrays of Small Antennas

# 4 Future Conferences

## 4.1 ICEAA and IEEE APWC 2014

The 2104 International Conference on Electromagnetics in Advanced Applications, and IEEE–APS Topical Conference on Antennas and Propagation in Wireless Communications
Date: August 3–9, 2014
Venue: Palm Beach, Aruba.
Web page: http://www.iceaa-offshore.org

## 4.2 URSI GASS 2014

31th URSI General Assembly and Scientific Symposium
Date: August 16–23, 2014
Venue: Beijing Cnference Center, Beijing, China
Web page: http://chinaurisigass.com

## 4.3 35th PIERS in Guangzhou

The 35th PIERS 2013 in Guangzhou, China
Date: August 25–28, 2014
Venue: TBD
Web page: http://www.piers.org/

## 4.4 APMC 2014

The 2014 Asia-Pacific Microwave Conference
Date: Nov. 4–7, 2014
Venue: Sendai International Center, Sendai, Japan
Web Page: http://www.apmc2014.org