

**ICEAA '12  
IEEE APWC  
EEIS '12**



**CAPE TOWN, SOUTH AFRICA  
2-7 September 2012**



# ICEAA '12 IEEE APWC '12 EEIS '12

*Organized by*

POLITECNICO DI TORINO  
UNIVERSITY OF STELLENBOSCH

*In cooperation with*

IEEE Antennas and Propagation Society  
URSI, the International Union of Radio Science

Istituto Superiore Mario Boella  
sulle Tecnologie dell'Informazione  
e delle Telecomunicazioni

Torino Wireless Foundation  
COREP

*Sponsored by*

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**FINAL PROGRAM**

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<b>Roberto D. Graglia</b>	Politecnico di Torino, Italy
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## WELCOME TO THE CONFERENCES

On behalf of the Steering Committee, of the Organizing Committee and of the Scientific Committee, it gives us great pleasure to welcome all participants to the fourteenth edition of ICEAA (International Conference on Electromagnetics in Advanced Applications), to the second edition of IEEE APWC (the IEEE-APS Topical Conference on Antennas and Propagation in Wireless Communications), and the first edition of EEIS (the URSI Electromagnetic Environment and Interference Symposium). These three conferences share a common organization, registration fee, submission site, workshops and short courses, and social events.

These Conferences together have a wide scope, which includes all kinds of advanced applications in Electromagnetics and new technology developments. Broad areas are covered, ranging from Cognitive Radio to Electromagnetic Compatibility and Intentional Electromagnetic Interference, from Antennas, Propagation, and Components Technologies to Radar Cross Section and Asymptotic Techniques, from Electromagnetic Applications to Biomedicine to Computational Electromagnetics, from Wireless Communications to Metamaterials and Nano-magnetism. This year, the conferences feature a particularly strong focus on radio astronomy; South Africa will be co-hosting the Square Kilometer Array radio telescope and there are sessions focusing on precursor instruments and planning for the SKA, and new phased array feed technologies. There is also a workshop on the latter.

The three conferences altogether feature 32 special sessions organized by renowned experts and a total of 46 sessions. (Two sessions are ICEAA-EEIS joint sessions.) In particular, the ICEAA 2012 Conference program consists of 33 sessions including 24 Special Sessions; the IEEE APWC 2012 Conference program consists of 11 sessions including 6 special sessions; the EEIS Conference program consists of 4 sessions including 3 Special Sessions. More than 350 papers are scheduled, out of the 455 submitted. As in previous ICEAA editions invited papers will be presented at the three Conferences, giving recent information on the state of the art and new technologies. A half-day short course on "Balun Designs for RF and Microwave Applications" will be held on Friday morning, September 7, by Prof. J.H. Cloete of the University of Stellenbosch, South Africa. Another half-day short

course on “Practical Aspects of EMC for Engineers” will also be held on Friday morning September 7, by Prof. C. Christopoulos of the University of Nottingham, UK. We also welcome two IEEE AP-S Distinguished Lecturers, Prof. P.-S. Kildal, Chalmers University of Technology, Sweden, and Dr. Arun K. Bhattacharyya, Northrop Grumman Corporation, USA, who will be presenting plenary lectures at the Conferences.

The 2012 Conferences are organized by the Politecnico di Torino, Italy and the University of Stellenbosch, South Africa. The Politecnico di Torino, a State University founded in 1859, is one of the major technical universities in Italy. The Politecnico currently numbers 30,000 students, with about one third of the 16,000 students in Engineering that follow curricula in Information Engineering. The University of Stellenbosch is one of South Africa’s leading research-intensive universities, and has recently been listed on several of the Top 500 international lists. Proclaimed as a University in 1918, it originated in a Theological Seminary, coincidentally also founded in 1859.

The Conferences are held at the Southern Sun Cape Sun hotel and conference centre. The hotel lies in the centre of the Cape Town CBD, and is complemented by spectacular views over Table Mountain, Robben Island, Table Bay and the striking Green Point Stadium, rebuilt for the 2010 World Cup. It is ideally located as a base for visiting the many attractions in Cape Town and environs.

We look forward to seeing you in Cape Town in September.

**Roberto D. Graglia**

*Chairman of the ICEAA - IEEE APWC - EEIS 2012 Organizing Committee*

**David B. Davidson**

*Chairman of the ICEAA - IEEE APWC - EEIS 2012 Local Organizing Committee*

# GENERAL INFORMATION

## DATES AND LOCATION

The conferences will be held from 3rd to 7th September 2012, at the Southern Sun Cape Sun, Strand Street, Cape Town (see map).

GPS Co-ordinates: 33°55'17.29" S | 18°25'18.73" E

Directions: From airport (CPT) take N2 to Cape Town. Follow until Strand Street turnoff to the city. Cross 3 traffic lights & Hotel is on left side.

## OFFICIAL LANGUAGE

The official language will be English. No simultaneous translation will be provided.

## PROCEEDINGS

At the registration, each participant will receive a copy of the Conference Proceedings.

## REGISTRATION FEE

The ICEAA, IEEE APWC and EEIS conference share a common organization, registration fee, submission site, workshops and short courses, and social events. The registration fee is 7200 South African Rand (ZAR) per person, VAT included. The registration fee for IEEE members is ZAR6800 per person, VAT included. Full registration is required of all participants, including members of the Conference Committees, Session Chairs and Authors. A non-refundable registration for each paper has been required from the corresponding author at the time of submission of the contribution in final form. The registration fee includes attendance to all sessions, luncheons and coffee breaks, welcome reception, banquet, and participants' briefcase containing the Conference Proceedings and other material.

## REGISTRATION AT THE CONFERENCE

A registration desk will be located in front of the Franschoek Room (across the VOC room entrances as indicated on the floorplan attached) on the 3rd floor of



the Hotel's conference centre on Sunday 2 September from 15:00 – 17:00. For the duration of the conference, accompanying persons and late registrants may register, or pre-registrants may pick up conference materials, at the following times: Monday: 8:00÷15:30, Tuesday through Thursday: 8:30÷15:30. The accompanying person fee is ZAR1200.00 (±120,00 Euro) and includes only the welcome reception and banquet.

## **MEALS AND REFRESHMENTS**

Coffee breaks and luncheons are included in the registration fee. Luncheons will be served in the hotel.

### **WELCOME RECEPTION**

**Sunday September 2, from 6:00 to 8:30pm**

A welcome function will be held on Sunday evening, 2nd September at Baía Restaurant on V & A Waterfront for all delegates and registered accompanying persons that indicated attendance. Transportation arrangements will be available at the conference registration desk.

### **BANQUET**

The banquet/gala dinner will be held on Wednesday evening, 5th September at Pigalle Greenpoint Restaurant, Cape Town, for all delegates and registered accompanying persons that indicated attendance. Transportation arrangements will be available at the conference registration desk.

### **PARKING**

Parking is available in the Picbel Parkade located diagonally across the hotel on Strand Street and complimentary parking vouchers may be collected from the registration desk on a daily basis. The parking voucher received at the parkade entrance must be retained and handed in, together with the complimentary voucher as payment.

### **AUDIOVISUAL EQUIPMENT**

Each meeting room will be equipped with a notebook

computer. Other equipment will be available only upon written request to the Organizing Committee, to be received before August 3. The presenting authors will not be allowed to use their personal computer for presentation; only the computer of the meeting rooms can be used for presentation.

## **INTERNET CONNECTION**

The Conference Centre features WI-FI Internet access. Limited access will be given free of charge for the duration of the conference to all delegates.

## **MESSAGES**

During the Conference, messages may be directed to participants via Email ([iceaa12@iceaa.polito.it](mailto:iceaa12@iceaa.polito.it)) or [neldar@sun.ac.za](mailto:neldar@sun.ac.za) or [hanrik@sun.ac.za](mailto:hanrik@sun.ac.za) or telephone +27 (0)21 488 4222/3 during conference hours.

Messages will be posted at the notice board at the registration desk in front of the VOC rooms of the hotel's conference centre.

## **TRANSPORTATION**

Cape Town International Airport (<http://www.acsa.co.za/index.asp>) is located about 20km east of the centre of the city, and may be reached by bus or taxi. There are convenient non-stop flights to several of the main European airports (Amsterdam, Frankfurt, London); there are regular connections to O R Tambo International Airport (Johannesburg), South Africa's main port of entry, from which there are excellent connections worldwide.

Airport transfers can be arranged directly through the hotel or via Destination alliance. Contact: Karen Salter, Tel: +27 (0)21 802 0982 or +27 (0) 21 762 4901; or see [www.destinationalliance.co.za](http://www.destinationalliance.co.za)

## **WEATHER**

During September, the weather in the Western Cape is varied. The number of daylight hours in Cape Town during September rises from eleven and a half hours at the beginning of the month to twelve and a half daylight hours by the end of September. Cape Town's climate in August is sometimes rainy, sometimes sunny - but

never boring. Typical temperatures during September are around 9°C at night and 20°C during the day (48 and 67°F), but can fluctuate substantially. The wind is blustery rather than gale force as it changes from a predominantly north-westerly direction to the south-easterly wind typical of Cape Town's summer months. Please see <http://www.climateandweather.com/weather-in-cape-town-in-september> for more details.

## **WHAT TO PACK**

Visitors to Cape Town in spring should pack for three seasons. Light raincoats or jackets are essential, as are cool summery clothes for the warm spring days. Evening functions and restaurants generally require smart casual clothes, but jeans and a light jersey will easily suffice at most late night venues. The weather can change very rapidly, and it also varies significantly with local geography; the weather can be quite different on opposite sides of Table Mountain, and it can be very cold on top of the mountain.

## **WHAT'S ON IN AND AROUND CAPE TOWN IN SEPTEMBER**

One of the most popular reasons for visiting Cape Town in spring are the flower festivals. There are a number of great flower festivals a short day trip from Cape Town. Some of the most popular festivals take place along the West Coast, particularly in Clanwilliam, Darling, Tulbagh and Caledon. September is a great time to view whales and their calves at the Hermanus Whale Festival. The Franschoek Uncorked festival also takes place in spring; visitors can enjoy live entertainment, wine tasting and art exhibitions. Visitors, particularly those travelling with children, can also take part in strawberry picking in and around the Cape Winelands.

## **HOTEL RESERVATIONS**

A number of hotel rooms in the conference hotel have been reserved for the period of the conference. Please use the form available on <http://www.iceaa-offshore.org/>. A credit card number is required to guarantee reservations.

## ACCOMPANYING PERSON PROGRAMME

For the latest information on the Accompanying Person Programme and other Social Events please check <http://www.iceaa-offshore.org/>, or refer to the Conference registration desk.

## OTHER ACTIVITIES

There are a number of activities in Cape Town throughout the year, especially in arts and culture. We invite you to visit the website <http://www.whatsonincapetown.com/> to search for the activities of your choice.

## USEFUL ADDRESSES

*For technical and scientific aspects:*

### **ICEAA Secretariat**

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*For logistics aspects:*

### **CONSULTUS**

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ICEAA - IEEE 2012 Conference

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*For hotel reservations:*

### **Tsogo Sun Cape Sun**

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Phone: +27 (0)21 488 5100

## TECHNICAL EXHIBITION

A technical exhibition will be held in the area near the Conference Rooms. Exhibitors and others requiring further information on this matter should contact CONSULTUS (contact details above).

## **ICEAA - IEEE APWC - EEIS 2012 YOUNG SCIENTIST AWARD**

A certificate and a prize of ZAR 8000 will be awarded to the young scientists (aged not more than thirty-six as of June 8, 2012) who have earned a Ph.D. or equivalent degree and has authored the best ICEAA or IEEE APWC or EEIS paper in terms of content and impact on Electromagnetics. The finalists for this Award must present their paper in a special poster session scheduled for Monday afternoon, September 3 2012, in the coffee-break area. In case of eligible coauthors who are registered participants at ICEAA - IEEE APWC - EEIS, each awardee will receive a certificate and the cash award will be shared equally among them. The winner(s) of the ICEAA - IEEE APWC - EEIS 2012 Young Scientist Award will be announced at the Conference Banquet on Wednesday evening, September 5, 2012. Since the award announcement and presentation are made at the Banquet, all candidates are expected to attend the Banquet.

### ***SHORT COURSE ON* BALUN DESIGNS FOR RF AND MICROWAVE APPLICATIONS**

Prof. Johannes H. Cloete of the Department of Electrical and Electronic Engineering, University of Stellenbosch, South Africa, will hold a half-day short course on Balun Designs for RF and Microwave Applications, on Friday morning, September 7. Participants may register for this short course on the conference registration form or at the conference registration desk. The cost of the short course is ZAR 750 (VAT included).

### ***SHORT COURSE ON* PRACTICAL ASPECTS OF EMC FOR ENGINEERS**

Prof. Christos Christopoulos of the School of Electrical and Electronic Engineering, University of Nottingham, UK, will hold a half-day short course on Practical Aspects of EMC for Engineers, on Friday morning, September 7. Participants may register for this short course on the conference registration form or at the conference registration desk. The cost of the short course is ZAR 750 (VAT included).

# CONFERENCE SCHEDULE

**MONDAY, SEPTEMBER 3**  
**ROOM VOC NORTH**

## Formal Opening

10:20 ÷ 11:20

### Plenary address by IEEE AP-S Distinguished Lecturer P.-S. Kildal

*Chalmers University of Technology, Sweden*

#### OTA-MIMO Measurements in Reverberation Chamber: New Developments and Appropriate System Models including OFDM



**SUMMARY:** The reverberation chamber has during the last 10 years been developed into a fast, accurate and cost-effective instrument for emulating rich isotropic multipath and thereby characterizing small antennas and wireless terminals Over-The-Air (OTA) during fading. The lecture will summarize previous developments regarding how to measure efficiency, diversity gain, maximum available MIMO capacity, total radiated power and receiver sensitivity. The theory for the description of the channel will be presented, including also the uncertainty by which efficiency-related parameters can be measured. Most of the lecture will be devoted to throughput measurements of complete systems with MIMO capability, such as for WLAN 802.11n, LTE and WiMAX. The lecture will also explain how the time and frequency domain characteristics of the chamber (Doppler spread, time delay spread, coherence bandwidth) can be determined, and controlled to become similar to those in real-life environments, so that both frequency-selective and frequency-flat fading can be tested. A new simple theoretical model for throughput of LTE device with MIMO and OFDM frequency diversity will be presented, showing excellent agreement with measurements. The lecture will also describe how throughput curves are related to diversity gains that are obtained from user-distributed CDFs, and how a related diversity gain can be defined also for pure Line-of-Sight (LOS) environments when the randomness of the orientation of the user and his wireless device is taken into account.

11:20 ÷ 12:20

### Plenary address by IEEE AP-S Distinguished Lecturer A. K. Bhattacharyya

*Northrop Grumman Corporation, USA*

#### Efficient Shaped Beam Synthesis in Phased Arrays and Reflectors



**SUMMARY:** Shaped beam array synthesis invites considerable attentions because arrays offer in-orbit reconfigurability, which is an attractive feature for communication and broadcasting satellites. In this talk, we present a brief overview of commonly used beam shaping algorithms. This is followed by the Projection Matrix Method of synthesis. The Projection Matrix method relies on orthogonal projection of the desired far field intensity vector onto the space spanned by the far field intensity vectors of the array elements. It is found that for a uniform convergence of the solution the far field sample space must be extended beyond the coverage region, otherwise the projection matrix becomes ill-conditioned. A general guideline for the far field sample space is provided. The method, with necessary amendments, is then employed successfully for a reflector surface synthesis. The method is found to be several times faster than the gradient search method commonly used for beam synthesis. Numerical results for array and shaped reflector syntheses are shown and the advantages are discussed.

13:40 ÷ 14:40

## MONDAY, SEPTEMBER 3

ROOM VOC NORTH	ROOM VOC SOUTH	ROOM CONSTANTIA	ROOM STELLENBOSCH	ROOM PAARL
<p><b>Session 1 ICEAA</b></p> <p><b>Organized by D.B. Davidson and H.C. Reader</b></p> <p>Radio Astronomy (including SKA)</p> <p>Chairs: D. B. Davidson, H.C. Reader</p> <p>8:00 ÷ 18:00</p>	<p><b>Session 2 ICEAA</b></p> <p><b>Organized by M.N. Georgieva- Grosse and G. N. Georgiev</b></p> <p>Modern Problems of Mathematical and Computational Electromagnetics and their Advanced Applications</p> <p>Chairs: M.N. Georgieva- Grosse, G. N. Georgiev</p> <p>8:00 ÷ 16:40</p>	<p><b>Session 4 IEEE APWC</b></p> <p><b>Organized by Y. Wen</b></p> <p>EMC and its Technologies</p> <p>Chair: Y. Wen</p> <p>8:00 ÷ 16:20</p>	<p><b>Session 6 ICEAA</b></p> <p>Inverse scattering, RCS and asymptotic techniques</p> <p>Chairs: H. Kruger, M. Okoniewski</p> <p>8:20 ÷ 10:00</p>	<p><b>Session 8 IEEE APWC</b></p> <p><b>Organized by M. Hein and W. Wiesbeck</b></p> <p>Ultra-wideband Systems for Biomedical Diagnostics</p> <p>Chairs: M. Hein, W. Wiesbeck</p> <p>8:00 ÷ 10:00</p>
	<p><b>Session 3 ICEAA</b></p> <p><b>Organized by M.N. Georgieva- Grosse and G. N. Georgiev</b></p> <p>Advanced Applications of the Mathematical and Computational Electromagnetics</p> <p>Chairs: M.N. Georgieva-Grosse, G. N. Georgiev</p> <p>16:40 ÷ 17:40</p>	<p><b>Session 5 ICEAA</b></p> <p><b>Organized by A. Boag</b></p> <p>Fast Computational Methods</p> <p>Chairs: A. Boag, R. Kastner</p> <p>16:20 ÷ 18:00</p>	<p><b>Session 7 ICEAA</b></p> <p><b>Organized by A. Alu' and A. Yaghjian</b></p> <p>Electromagnetic Theory of Metamaterials</p> <p>Chairs: S. Tretyakov, A. Yaghjian</p> <p>14:40 ÷ 18:00</p>	<p><b>Session 9 ICEAA</b></p> <p><b>Organized by G. Manara and P. Pathak</b></p> <p>Numerical, Asymptotic and Hybrid Methods</p> <p>Chairs: G. Manara, P. Pathak</p> <p>14:40 ÷ 17:20</p>

Coffee break 10:00÷10:20

Lunch break 12:20÷13:40

Coffee break 15:40÷16:00

**POSTER SESSION FOR YOUNG SCIENTIST AWARD 14:40÷18:00**

## TUESDAY, SEPTEMBER 4

ROOM VOC NORTH	ROOM VOC SOUTH	ROOM CONSTANTIA	ROOM STELLENBOSCH	ROOM PAARL
<p><b>Session 10 IEEE APWC</b></p> <p><b>Organized by H. Nakano</b></p> <p>Multiband, Wideband, and Functional Antennas Part I</p> <p>Chairs: H. Iwasaki, H. Nakano</p> <p>8:00 ÷ 14:40</p>	<p><b>Session 14 ICEAA</b></p> <p><b>Organized by M. Ivashina, R. Maaskant, and K. Warnick</b></p> <p>Imaging Arrays for Radio Astronomy</p> <p>Chairs: M. Ivashina, R. Maaskant, K. Warnick</p> <p>8:00 ÷ 16:20</p>	<p><b>Session 16 ICEAA</b></p> <p><b>Organized by R.D. Graglia and D.R. Wilton</b></p> <p>Computational Electromagnetics</p> <p>Chairs: R. D. Graglia, D. R. Wilton</p> <p>8:00 ÷ 15:40</p>	<p><b>Session 18 ICEAA-EEIS</b></p> <p>EM Theory</p> <p>Chairs: A.K. Mishra, G. Perona</p> <p>8:00 ÷ 12:20</p>	<p><b>Session 21 EEIS</b></p> <p><b>Organized by C. Christopoulos</b></p> <p>Complexity and Uncertainty in EMC Studies</p> <p>Chairs: C. Christopoulos, K. K. Stavrakakis</p> <p>8:40 ÷ 10:00</p>
<p><b>Session 11 ICEAA</b></p> <p>Electromagnetic Properties of Materials</p> <p>Chairs: A. R. Baghai-Wadji, A. Leicht</p> <p>14:40 ÷ 15:40</p>			<p><b>Session 19 ICEAA</b></p> <p><b>Organized by G. Franceschetti and N. Shinohara</b></p> <p>Wireless Power Transmission</p> <p>Chairs: G. Franceschetti, N. Shinohara</p> <p>13:40 ÷ 15:40</p>	<p><b>Session 22 ICEAA</b></p> <p><b>Organized by D.I.L. de Villiers and P. Meyer</b></p> <p>Modelling of Complex Electromagnetic Devices</p> <p>Chairs: D.I.L. de Villiers, P. Meyer</p> <p>10:20 ÷ 11:40</p>
<p><b>Session 12 ICEAA</b></p> <p>EM Measurements</p> <p>Chairs: C. Baer, B. Will</p> <p>16:00 ÷ 17:20</p>	<p><b>Session 15 ICEAA</b></p> <p>Electromagnetic Modeling of Devices and Circuits</p> <p>Chairs: F. Gronwald, M. Pereira</p> <p>16:20 ÷ 18:00</p>	<p><b>Session 17 ICEAA</b></p> <p><b>Organized by B. de Hon and R. Remis</b></p> <p>Imaging, Inversion and Optimization</p> <p>Chairs: B. de Hon, R. Remis</p> <p>16:00 ÷ 18:00</p>	<p><b>Session 20 ICEAA</b></p> <p><b>Organized by K. Ito</b></p> <p>Electromagnetics for Medical Applications</p> <p>Chairs: K.P. Esselle, K. Ito</p> <p>16:00 ÷ 17:40</p>	
<p><b>Session 13 ICEAA</b></p> <p>Optoelectronics and Photonics Chair: C. Fisher</p> <p>17:20 ÷ 18:00</p>				
<p>Coffee break 10:00÷10:20</p> <p>Lunch break 12:20÷13:40</p> <p>Coffee break 15:40÷16:00</p>				



## WEDNESDAY, SEPTEMBER 5

ROOM VOC NORTH	ROOM VOC SOUTH	ROOM CONSTANTIA	ROOM STELLENBOSCH
<p><b>Session 23 IEEE APWC</b></p> <p>Wireless Networks</p> <p>Chairs: A.A. Lysko, J du Toit</p> <p>8:00 ÷ 10:00</p>	<p><b>Session 26 IEEE APWC</b></p> <p>Antennas and Arrays - I</p> <p>Chairs: S. Barbin, L. Matekovits</p> <p>8:00 ÷ 11:40</p>	<p><b>Session 29 ICEAA</b></p> <p><b>Organized by J. Jin and B. Shanker</b></p> <p>Recent Advances in Integral Equation and Finite Element Methods</p> <p>Chairs: J. Jin, B. Shanker</p> <p>8:00 ÷ 11:40</p>	<p><b>Session 31 ICEAA</b></p> <p><b>Organized by P. Russer</b></p> <p>Network Methods Applied to Electromagnetic Field Computation</p> <p>Chairs: P. Russer, S. Wane</p> <p>8:00 ÷ 11:40</p>
<p><b>Session 24 IEEE APWC</b></p> <p>Channel Modeling</p> <p>Chairs: P. Degauque, T. Tjelta</p> <p>10:20 ÷ 12:20</p>	<p><b>Session 27 EEIS</b></p> <p><b>Organized by D.V. Giri</b></p> <p>HPEM: Environments, Modeling and Measurements</p> <p>Chairs: D.V. Giri, R. L. Gardner</p> <p>11:40 ÷ 15:20</p>	<p><b>Session 30 IEEE APWC</b></p> <p><b>Organized by H. Nakano</b></p> <p>Multiband, Wideband, and Functional Antennas Part II</p> <p>Chairs: H. Nakano, O. Quevedo-Teruel</p>	<p><b>Session 32 ICEAA</b></p> <p><b>Organized by J. Simpson</b></p> <p>Bioelectromagnetics</p> <p>Chairs: M. Hasan, P. Meaney</p> <p>11:40 ÷ 15:00</p>
<p><b>Session 25 ICEAA</b></p> <p><b>Organized by I. Bogaert and P. Lagasse</b></p> <p>Frontiers in Integral Equation Methods</p> <p>Chairs: I. Bogaert, P. Lagasse</p> <p>13:40 ÷ 16:20</p>	<p><b>Session 28 ICEAA</b></p> <p>EMC/EMI/EMP</p> <p>Chairs: D.V. Giri, R. L. Gardner</p> <p>15:20 ÷ 17:00</p>	<p>Chairs: H. Nakano, O. Quevedo-Teruel</p>	<p><b>Session 33 ICEAA</b></p> <p>EM Applications to Biomedicine</p> <p>Chairs: M. Hasan, P. Meaney</p> <p>15:00 ÷ 16:40</p>
<p>Coffee break 10:00÷10:20 Lunch break 12:20÷13:40 Coffee break 15:40÷16:00</p>			

**Gala dinner  
at Pigalle Greenpoint Restaurant,  
Western Cape, Cape Town: 19:00**

## THURSDAY, SEPTEMBER 6

ROOM VOC NORTH	ROOM VOC SOUTH	ROOM CONSTANTIA	ROOM STELLENBOSCH	ROOM PAARL
<p><b>Session 34 ICEAA</b></p> <p><b>Organized by L. Klinkenbusch and K. Langenberg</b></p> <p>Fields and Waves</p> <p>Chairs: L. Klinkenbusch, K. Langenberg</p> <p>8:00 ÷ 11:20</p>	<p><b>Session 36 ICEAA</b></p> <p><b>Organized by R. Maaskant and R. Mittra</b></p> <p>Recent Advances in Computational EM</p> <p>Chairs: R. Maaskant, R. Mittra</p> <p>8:00 ÷ 12:20</p>	<p><b>Session 39 IEEE APWC</b></p> <p><b>Organized by D. Baker and J. Cloete</b></p> <p>Antennas and Propagation, Systems and Applications</p> <p>Chairs: D. Baker, J. Cloete</p> <p>8:00 ÷ 12:20</p>	<p><b>Session 42 ICEAA</b></p> <p><b>Organized by M.M. Botha and T. Rylander</b></p> <p>Finite Methods</p> <p>Chair: M.M. Botha</p> <p>8:20 ÷ 10:00</p>	<p><b>Session 46 IEEE APWC</b></p> <p><b>Organized by Y. Rahmat-Samii and J.L. Volakis</b></p> <p>Celebrating Sixty Years of Geometrical Theory of Diffraction</p> <p>Chairs: Y. Rahmat-Samii, J.L. Volakis</p> <p>8:00 ÷ 10:00</p>
<p><b>Session 35 ICEAA</b></p> <p>Antennas and Arrays - II</p> <p>Chairs: W.P. du Plessis, A.V. Raisanen</p> <p>11:20 ÷ 16:20</p>	<p><b>Session 37 IEEE APWC</b></p> <p><b>Organized by J. Joubert and W. Odendaal</b></p> <p>Multi-band and UWB Antennas - I</p> <p>Chairs: J. Joubert, W. Odendaal</p> <p>13:40 ÷ 17:00</p>	<p><b>Session 40 ICEAA</b></p> <p><b>Organized by C. Caloz</b></p> <p>Nano- Electromagnetics: Novel Materials, Phenomena and Devices</p> <p>Chairs: C. Caloz, T. Rozzi</p> <p>13:40 ÷ 17:20</p>	<p><b>Session 43 ICEAA</b></p> <p><b>Organized by E. Marx and A. Osipov</b></p> <p>Advanced Electromagnetics</p> <p>Chair: A. Osipov</p> <p>10:20 ÷ 12:20</p>	<p><b>Session 44 ICEAA</b></p> <p><b>Organized by J. Arnold and P. Smith</b></p> <p>Mathematical Advances in Electromagnetics</p> <p>Chairs: J. Arnold, P. Smith</p> <p>13:40 ÷ 16:20</p>
<p><b>Session 38 IEEE APWC</b></p> <p>Multi-band and UWB Antennas - II</p> <p>Chairs: J. Joubert, W. Odendaal</p> <p>17:00 ÷ 18:00</p>	<p><b>Session 41 ICEAA</b></p> <p>EM Applications to Nanotechnology</p> <p>Chairs: C. Caloz, T. Rozzi</p> <p>17:20 ÷ 18:00</p>	<p><b>Session 45 ICEAA-EEIS</b></p> <p><b>Organized by T. Clarke and D. Erricolo</b></p> <p>Effects of EM pulses on Digital Systems</p> <p>Chairs: T. Clarke, D. Beetner</p> <p>16:20 ÷ 18:00</p>	<p>Coffee break 10:00÷10:20 Lunch break 12:20÷13:40 Coffee break 15:40÷16:00</p>	

## FRIDAY, SEPTEMBER 7

ROOM PAARL	ROOM CONSTANTIA
<p data-bbox="232 220 384 247">Short Course on</p> <p data-bbox="190 277 428 329"><b>Balun Designs for RF and Microwave Applications</b></p> <p data-bbox="216 390 400 441"><b>Lecturer: Johannes H. Cloete</b></p> <p data-bbox="252 498 363 525">8:20 ÷ 12:20</p>	<p data-bbox="650 220 802 247">Short Course on</p> <p data-bbox="632 277 821 329"><b>Practical Aspects of EMC for Engineers</b></p> <p data-bbox="619 390 835 441"><b>Lecturer: Christos Christopoulos</b></p> <p data-bbox="671 498 782 525">8:20 ÷ 12:20</p>

# FINAL PROGRAM

Monday, September 3, 2012, room VOC North

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**Session 01 - ICEAA**  
**RADIO ASTRONOMY (INCLUDING SKA)**  
**Organized by D.B. Davidson and H.C. Reader**

Chairs: D.B. Davidson, H.C. Reader

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8:00 - 8:20

**AN OVERVIEW OF ELECTROMAGNETICS, SIGNAL PROCESSING, IMAGING AND CALIBRATION FOR MEERKAT**

*D.B. Davidson, Stellenbosch University, South Africa;*  
*J. Jonas, Rhodes University, South Africa*

8:20 - 8:40

**THE DESIGN OF THE MEERKAT DISH OPTICS**

*I.P. Theron, EMSS Antennas, South Africa;*  
*R. Lehmensiek, EMSS Antennas, South Africa;*  
*D.I.L. de Villiers, Stellenbosch University, South Africa*

8:40 - 9:00

**AN UPDATE ON THE MECHANICAL AND EM PERFORMANCE OF THE COMPOSITE DISH VERIFICATION ANTENNA (DVA-1) FOR THE SKA**

*G. E. Lacy, National Research Council, Canada;*  
*M. Fleming, Minex Engineering Corp., United States;*  
*L. Baker, Cornell University, United States;*  
*W. Imbriale, Jet Propulsion Laboratory, United States;*  
*G. Cortes-Medellin, Cornell University, United States;*  
*B. Veidt, G. J. Hovey, National Research Council, Canada;*  
*D. DeBoer, University of California at Berkeley, United States*

9:00 - 9:20

**MEETING MEERKAT'S SIGNAL PROCESSING CHALLENGES**

*J. Manley, F. Kapp, S. Malan, SKA-South Africa, South Africa*

9:20 - 9:40

**COMPRESSED SENSING IMAGING WITH THE KAT-7 ARRAY**

*L.C. Schwardt, SKA South Africa, South Africa*

9:40 - 10:00

**UNDERSTANDING THE IMPACT OF BEAMSHAPES ON RADIO INTERFEROMETER IMAGING PERFORMANCE**

*O.M. Smirnov, Department of Physics and Electronics, Rhodes University, South Africa;*  
*B.S. Frank, Astrophysics, Cosmology and Gravity Centre (ACGC), Department of Astronomy, University of Cape Town, South Africa;*  
*I.P. Theron, EMSS Antennas, South Africa;*  
*I. Heywood, Astrophysics, Department of Physics, University of Oxford, United Kingdom*

14:40 - 15:00

**MEERKAT RFI ENVIRONMENT MODELING AND METROLOGY**

*H. C. Reader, A. J. Otto, P. S. van der Merwe, P. G. Wiid, J. A. Andriambelosen, A. R. Botha, Univ. of Stellenbosch, South Africa*

15:00 - 15:20

**SYSTEM DESIGN FOR SKA CAPABLE APERTURE ARRAYS**

*A.J. Faulkner, P. Alexander, University of Cambridge, United Kingdom; J.G Bij de Vaate, ASTRON, Netherlands*

15:20 - 15:40

**APERTURE ARRAYS FOR THE SQUARE KILOMETRE ARRAY**

*J.G. Bij de Vaate, ASTRON, Netherlands; A.J. Faulkner, Cambridge University, United Kingdom*

16:00 - 16:20

**SCANNING PERFORMANCE OF SKA-LOW SPARSE ARRAY CONFIGURATIONS INCORPORATING REALISTIC ELEMENT PATTERNS AND SKY NOISE CONTRIBUTIONS**

*A. El-Makadema, The University of Manchester, United Kingdom; N. Razavi-Ghods, University of Cambridge, United Kingdom; A.K. Brown, The University of Manchester, United Kingdom*

16:20 - 16:40

**CHARACTERIZATION OF SKA-AALOW ANTENNA ELEMENTS IN THE ARRAY ENVIRONMENT**

*C. Raucy, ICTEAM, UCL, Belgium; E. de Lera Acedo, N. Razavi-Ghods, University of Cambridge, United Kingdom; C. Craeye, ICTEAM, UCL, Belgium*

16:40 - 17:00

**A HIGH PERFORMANCE PLANAR PHASED ARRAY FOR WIDE FIELD OF VIEW APPLICATIONS**

*Y. Zhang, A. Brown, The University of Manchester, United Kingdom*

17:00 - 17:20

**OPTIMAL SKA ANTENNA CONFIGURATION USING GENETIC ALGORITHMS**

*A. Gauci, J. Abela, University of Malta, Malta; K. Zarb Adami, University of Oxford, United Kingdom*

17:20 - 17:40

**EMC CERTIFICATION OF A DIGITAL RADIO ASTRONOMY RECEIVER – A CASE STUDY**

*F. Schlagenhauser, B. Crosse, D. Emrich, S. Tingay, P. Hall, ICRAR, Australia*

17:40 - 18:00

**REDUCING CELLULAR INTERFERENCE IN THE KAROO RADIO-ASTRONOMY RESERVE**

*G. Mayhew-Ridgers, P.A. Van Jaarsveld, Vodacom (Pty) Ltd., South Africa*

**Session 02 - ICEAA**  
**MODERN PROBLEMS OF MATHEMATICAL AND**  
**COMPUTATIONAL ELECTROMAGNETICS AND THEIR**  
**ADVANCED APPLICATIONS**  
**organized by M.N. Georgieva-Grosse and G. N. Georgiev**  
Chairs: M.N. Georgieva-Grosse, G. N. Georgiev

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8:00 - 8:20

**ON THE CLASS OF B1 NUMBERS: DEFINITION,  
NUMERICAL MODELING, DOMAIN OF EXISTENCE AND  
APPLICATION**

*M. N. Georgieva-Grosse, Consulting and Researcher in Physics  
and Computer Sciences, Germany; G. N. Georgiev, University of  
Veliko Tirnovo, Bulgaria*

8:20 - 8:40

**FULL WAVE MODELLING OF VLF WAVE SCATTERING  
AND PROPAGATION IN CURVILINEAR STRATIFIED  
IONOSPHERE**

*N.G. Lehtinen, T.F. Bell, L. Qiu, M.B. Cohen, Stanford University,  
United States; U.S. Inan, Stanford University; Koc University,  
Turkey*

8:40 - 9:00

**FAST FULL-WAVE ANALYSIS OF WIDEBAND CIRCULAR  
ANTENNA ARRAYS DEVOTED TO ACCURATE  
DIRECTION-FINDING AND POLARIMETRY**

*R. Sarkis, C. Craeye, Univeristé Catholique de Louvain, Belgium*

9:00 - 9:20

**A HYBRID PROJECTIVE METHOD FOR ANALYSIS OF  
ELECTROMAGNETIC SCATTERING FROM DOUBLY  
PERIODIC DIELECTRIC STRUCTURES**

*O.N. Smolnikova, Moscow Aviation Institute, Russia;  
S.P. Skobelev, Radiophysika, Russia*

9:20 - 9:40

**A MULTI-SCALE APPROACH TO COMPUTATIONAL  
PHOTONICS**

*A. Quandt, R. Warmbier, G.S. Manyali, University of the  
Witwatersrand, South Africa*

9:40 - 10:00

**ON THE APPLICABILITY OF THE SURFACE  
EQUIVALENCE THEOREM INSIDE ENCLOSURES**

*O. Franek, M. Sørensen, H. Ebert, G. F. Pedersen, Aalborg  
University, Denmark*

14:40 - 15:00

**ADVANCED COMPUTATIONAL METHODS FOR  
ANALYSIS OF THE CIRCULAR WAVEGUIDE COMPLETELY  
FILLED WITH AZIMUTHALLY MAGNETIZED FERRITE:  
REVIEW OF RECENT RESULTS**

*G. N. Georgiev, University of Veliko Tirnovo, Bulgaria;*

*M. N. Georgieva-Grosse, Consulting and Researcher in Physics and Computer Sciences, Germany*

15:00 - 15:20

**THE PROPAGATION OF ELECTROMAGNETIC WAVES IN THE WAVEGUIDE WITH SPACE-TIME PERIODIC INSERT**

*E. A. Gevorkyan, Moscow State University of Economics, Statistics and Informatics, Russia*

15:20 - 15:40

**INVESTIGATIONS INTO INTER-RELATIONS BETWEEN SPHERICAL RADIATION PATTERNS AND SAR DISTRIBUTION PRODUCED BY SELECTED DESIGNS OF WEARABLE TEXTILE ANTENNAS**

*T. Maleszka, P. Kabacik, Wroclaw University of Technology, Poland*

16:00 - 16:20

**COMPUTATIONAL PLASMONICS FOR COMPLEX DIELECTRIC MATERIALS**

*R. Warmbier, A. Quandt, G. Manyali, University of the Witwatersrand, South Africa*

16:20 - 16:40

**DESIGN AND MATERIALS FOR ACTIVE INFRARED WAVEGUIDES BASED ON HYBRID/ORGANIC MATERIALS**

*S. Penna, Università degli studi di Roma Tor Vergata, Italy; P.S.B. André, Universidade de Aveiro, Portugal; H.V. Baghdasaryan, State Engineering University of Armenia, Armenia; G.M. Tosi Beleffi, Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione-Ministero dello Sviluppo Economico, Italy*

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Monday, September 3, 2012, room VOC South

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**Session 03 - ICEAA**

**ADVANCED APPLICATIONS OF THE MATHEMATICAL AND COMPUTATIONAL ELECTROMAGNETICS**

**organized by M.N. Georgieva-Grosse and G. N. Georgiev**

Chairs: M.N. Georgieva-Grosse, G. N. Georgiev

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16:40 - 17:00

**CUT-OFF CHARACTERISTICS OF THE NORMAL TE<sub>0N</sub> MODES IN THE CIRCULAR WAVEGUIDE CONTAINING AN AZIMUTHALLY MAGNETIZED FERRITE CYLINDER AND A DIELECTRIC TOROID**

*M. N. Georgieva-Grosse, Consulting and Researcher in Physics and Computer Sciences, Germany; G. N. Georgiev, University of Veliko Tirnov, Bulgaria*

17:00 - 17:20

**PHOTONIC BAND STRUCTURES OF COMPLEX DIELECTRIC MATERIALS**

*A. Quandt, University of the Witwatersrand, South Africa; H.A.M. Leymann, Universitaet Magdeburg, Germany*

17:20 - 17:40

**ASSUMPTIONS ON THE CHARACTERISTIC PARAMETER OF THE COAXIAL FERRITE WAVEGUIDE PHASE SHIFTER AND ITS APPLICATION**

*M. N. Georgieva-Grosse, Consulting and Researcher in Physics and Computer Sciences, Germany; G. N. Georgiev, University of Veliko Tirnov, Bulgaria*

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Monday, September 3, 2012, room Constantia

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**Session 04 - IEEE APWC  
EMC AND ITS TECHNOLOGIES  
organized by Y. Wen**

Chair: Y. Wen

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8:00 - 8:20

**HARMONIC CURRENT ELIMINATION FOR SINGLE-PHASE RECTIFIERS BASED CARRIER PHASE-SHIFT**

*Jin Huang, Yang Lu, Bo Zhang, China Academy of Railway Sciences, China*

8:20 - 8:40

**GPS/COMPASS BASED TRAIN INTEGRATED POSITIONING METHOD FOR HIGH-SPEED RAILWAYS**

*J. Liu, BUAA & BJTU, China; B.G. Cai, BJTU, China; Y.P. Wang, BUAA, China; J. Wang, BJTU, China; W. Shangguan, BJTU, China*

8:40 - 9:00

**A ROI SETTING METHOD FOR VEHICLE DETECTION IN URBAN ENVIRONMENT**

*Zhong-li Wang, Beijing Jiaotong University, China*

9:00 - 9:20

**CHANNEL FADING STATISTICS IN HIGH-SPEED MOBILE ENVIRONMENT**

*Yinghong Wen, Beijing Jiaotong University, China; Yunshuang Ma, 2CSR Qingdao Sifang Locomotive & Rolling Stock Co., Ltd., China; Xiaoyan Zhang, Xiaoyun Jin, Fenglan Wang, Beijing Jiaotong University, China*

9:20 - 9:40

**CHAOTIC SVPWM CONTROL AND ITS APPLICATION IN EMI SUPPRESSION FOR PV INVERTERS**

*Hong Li, Fei Lin, Beijing Jiaotong University, China; Zhong Li, Wolfgang Halang, Fernuniversitaet in Hagen, Germany; Bo Zhang, South China University of Technology, China*

9:40 - 10:00

**RESEARCH AND SIMULATION OF CAR-FOLLOWING MODEL BASE ON CVIS**

*Cai Bai Gen, Chai Lin Guo, Shangguan Wei, Wang Jian, BJTU, China*



14:40 - 15:00

**RESEARCH ON SIMULATION TECHNOLOGY OF HLA-BASED COOPERATIVE VEHICLE-INFRASTRUCTURE SYSTEM**

*Shangguan Wei, Cai Baigen, Li SiHui, Wang Jian, BJTU, China*

15:00 - 15:20

**RESEARCH ON STATISTICAL PARAMETERS OF INTERFERENCE FOR DIGITAL RADIO**

*J.B. Zhang, Y.H. Wen, K.S. Zhou, Z.H. Tan, Y. Zhu, EMC lab., Beijing Jiaotong University, China*

15:20 - 15:40

**CONNECTED VEHICLE GID TRANSMISSION AND RECEPTION TEST WITH DSRC**

*Jian Wang, Beijing Jiaotong University, China; C. Shankwitz, A. Menon, University of Minnesota, United States; Baigen Cai, Wei Shangguan, Beijing Jiaotong University, China*

16:00 - 16:20

**IMPEDANCE MATCHING OF COMPOUND ABSORBER'S IMPACT ON CHARACTERISTIC OF ANECHOIC CHAMBER**

*Meng Xiao, The Fifth Electronics Research Institute of the Ministry of Industry and Information Technology, China; Ying-hong Wen, Beijing Jiaotong University, China*

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Monday, September 3, 2012, room Constantia

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**Session 05 - ICEAA  
FAST COMPUTATIONAL METHODS**

**Organized by A. Boag**

Chairs: A. Boag, R. Kastner

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16.20 - 16.40

**FAST SURFACE INTEGRAL EQUATION FORMULATIONS FOR LARGE-SCALE CONDUCTORS, METAMATERIALS, AND PLASMONIC PROBLEMS**

*J.M Taboada, University of Extremadura, Spain; M.G. Araújo, University of Vigo, Spain; J. Rivero, University of Extremadura, Spain; D.M. Solís, University of Vigo, Spain; L. Landesa, University of Extremadura, Spain; F. Obelleiro, University of Vigo, Spain*

16:40 - 17:00

**AN  $O(N_s N_t \log^2 N_t)$  METHOD FOR EVALUATING CONVOLUTIONS WITH THE TIME DOMAIN PERIODIC GREEN'S FUNCTION**

*D. Dault, N. V. Nair, B. Shanker, Michigan State University, United States*

17:00 - 7:20

**TRANSIENT NEAR-FIELD TO FAR-FIELD TRANSFORM BASED ON A MULTILEVEL SURFACE DECOMPOSITION SCHEME**

*A. Shlivinski, Ben-Gurion University of the Negev, Israel; A. Boag, Tel-Aviv University, Israel*

17:20 - 17:40

**INTEGRAL EQUATION FORMULATIONS BASED ON A  
GENERALIZED EQUIVALENCE PRINCIPLE**

*A. Boag, Tel Aviv University, Israel; V. Lomakin, University of  
California, San Diego, United States*

17:40 - 18:00

**FDTD STABILITY CRITERIA DERIVED IN THE Z-  
TRANSFORM DOMAIN**

*R. Kastner, Tel Aviv University, Israel; O. Harpaz, Tel Aviv  
University, Israel*

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Monday, September 3, 2012, room Stellenbosch

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**Session 06 - ICEAA  
INVERSE SCATTERING, RCS AND ASYMPTOTIC  
TECHNIQUES**

Chairs: H. Krüger, M. Okoniewski

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8:20 - 8:40

**THE INTRINSIC INFORMATION OF METAL DETECTOR  
RAW DATA AND HOW TO USE IT FOR HUMANITARIAN  
DEMINEING**

*H. Krüger, H. Ewald, University of Rostock, Germany*

8:40 - 9:00

**ANGULAR GLINT OF COMPLEX TARGETS FOR HIGH  
RANGE RESOLUTION RADAR**

*M. Sui, X. Xu, Beihang University, China*

9:00 - 9:20

**ACCELERATED FDTD TECHNIQUE FOR MARINE  
CONTROLLED SOURCE ELECTROMAGNETIC IMAGING**

*D. Pasalic, Acceleware Ltd, Canada; M. Okoniewski, University  
of Calgary/Acceleware, Canada*

9:20 - 9:40

**NEW MODELS FOR RADAR TARGETS AND  
BACKGROUND COUPLING**

*H.J. Mametsa, A. Bergès, ONERA DEMR, France; J. Rahm,  
E. Zdansky, A. Örbom, FOI, Sweden; C. Cochin, B. Maréchal,  
DGA Information Superiority, France*

9:40 - 10:00

**IMPACT OF RAIN ON MICROWAVE RADARS**

*C.T. Mulangu, S. Malinga, TJO Afullo, University of Kwazulu  
Natal, South Africa*

**Session 07 - ICEAA**  
**ELECTROMAGNETIC THEORY OF METAMATERIALS**

**Organized by A. Alu' and A. Yaghjian**

Chairs: S. Tretyakov, A. Yaghjian

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14:40 - 15:00

**HOMOGENIZATION OF METAMATERIALS FROM A BLOCH MODE PERSPECTIVE**

*C. Rockstuhl, C. Menzel, T. Paul, F. Lederer, Abbe Center of Photonics, Friedrich-Schiller-Universität Jena, Germany*

15:00 - 15:20

**EFFECTIVE RESPONSE OF METASURFACES: FROM PERIODICAL TO RANDOM STRUCTURES**

*M. Albooyeh, D. Morits, S. Tretyakov, Aalto University, Finland*

15:20 - 15:40

**LINEAR AND NONLINEAR COUPLING IN METAMATERIALS**

*D. Powell, Australian National University, Australia*

16:00 - 16:20

**ON ELECTROMAGNETIC FIELDS IN SKEWON-AXION MEDIA**

*I.V. Lindell, Aalto University, Finland*

16:20 - 16:40

**COMPUTATION OF THE ONE-DIMENSIONAL FREE-SPACE PERIODIC GREEN'S FUNCTION FOR LEAKY WAVES USING THE EWALD METHOD**

*V.R. Komanduri, D.R. Jackson, University of Houston, United States; F. Capolino, University of California, Irvine, United States; D.R. Wilton, University of Houston, United States*

16:40 - 17:00

**PROPERTIES OF FLOQUET-BLOCH SPACE HARMONICS IN 1D PERIODIC MAGNETO-DIELECTRIC STRUCTURES**

*O. Breinbjerg, Technical University of Denmark, Denmark*

17:00 - 17:20

**ANISOTROPIC REPRESENTATION FOR SPATIAL DISPERSION IN PERIODIC METAMATERIAL ARRAYS**

*A.D. Yaghjian, Research Consultant, United States; A. Alu, University of Texas, United States; M.G. Silveirinha, University of Coimbra, Portugal*

17:20 - 17:40

**MAXIMUM AND MINIMUM TRANSMITTANCE OF A STRUCTURE CONTAINING N IDENTICAL PAIRS OF LEFT- AND RIGHT-HANDED MATERIALS**

*M. Ubeid, Mohammed Shabat, Islamic University of Gaza, Egypt; M. Sid-Ahmed, Sudan University of Science and Technology, The Republic of The Sudan, Sudan*

17:40 - 18:00

**PLANE WAVE SCATTERING FROM DNG METAMATERIAL OF SEMI-ELLIPTICAL BOSS ABOVE A CONDUCTING PLANE**

*M. I. Hussein, United Arab Emirates University, United Arab Emirates*

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Monday, September 3, 2012, room Paarl

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**Session 08 - IEEE APWC  
ULTRA-WIDEBAND SYSTEMS FOR BIOMEDICAL  
DIAGNOSTICS**

**organized by M. Hein and W. Wiesbeck**

Chairs: M. Hein, W. Wiesbeck

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8.00 - 8.20

**ON- AND IN-BODY PATH LOSS MODELS BASED ON ANTENNA DE-EMBEDDING**

*D. Manteuffel, University of Kiel, Germany; M. Grimm, University of Kiel, Germany*

8:20 - 8:40

**ADVANTAGES OF PSWF-BASED MODELS FOR UWB SYSTEMS**

*W. Dullaert, H. Rogier, F. Boeykens, Ghent University - INTEC, Belgium*

8:40 - 9:00

**A PLANAR NEAR-FIELD MEASUREMENT SYSTEM OF UWB ANTENNAS FOR MEDICAL DIAGNOSTICS**

*Xuyang Li, K. Chu Sam, W. Wiesbeck, T. Zwick, Karlsruhe Institute of Technology, Germany*

9:00 - 9:20

**ULTRA-WIDEBAND ACTIVE ARRAY IMAGING FOR BIOMEDICAL DIAGNOSTICS**

*M.A. Hein, M. Helbig, M. Kmec, J. Sachs, F. Scotto di Clemente, Germany; R. Stephan, Ilmenau University of Technology, Germany; M. Hamouda, T. Ussmueller, R. Weigel, University of Erlangen, Germany; M. Robens, R. Wunderlich, S. Heinen, RWTH Aachen University, Germany*

9:20 - 9:40

**SPECTRAL IMAGING FOR COMPLEX CLINICAL BREAST STRUCTURES**

*P. Meaney, A. Golnabi, M. Pallone, N. Epstein, Dartmouth College, United States; P. Kaufman, Dartmouth-Hitchcock Medical Center, United States; S. Geimer, K. D. Paulsen, Dartmouth College, United States*

9:40 - 10:00

**UWB RADAR BASED CARDIAC MOTION DETECTION IN MEDICAL DIAGNOSTIC**

*O. Kosch, Physikalisch-Technische Bundesanstalt (PTB), Germany; F. Scotto di Clemente, M.A. Hein, Ilmenau University of Technology, Germany; F. Seifert, Physikalisch-Technische Bundesanstalt (PTB), Germany*

**Session 09 - ICEAA**  
**NUMERICAL, ASYMPTOTIC AND HYBRID METHODS**  
**organized by G. Manara and P. Pathak**

Chairs: G. Manara, P. Pathak

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14:40 - 15:00

**AN EFFICIENT TECHNIQUE FOR THE ANALYSIS OF UNCONVENTIONAL PERIODIC SURFACES**

*R. Caso, A. Buffi, P. Nepa, G. Manara, University of Pisa, Italy*

15:00 - 15:20

**SCATTERING BEHAVIOR COMPARISON FOR FIELD AND CURRENT BASED HIGH-FREQUENCY APPROXIMATION METHODS**

*R. Brem, T. F. Eibert, TU München, Germany*

15:20 - 15:40

**SPARSE BASIS EXPANSIONS FOR COMPRESSIVE SENSING OF ELECTROMAGNETIC SCATTERING PATTERNS COMPUTED USING ITERATIVE PHYSICAL OPTICS**

*R.J. Burkholder, A. N. O'Donnell, Ohio State University, United States; W.O. Coburn, U.S.Army Research Laboratory, United States; C.J. Reddy, Applied EM, Inc., United States*

16:00 - 16:20

**NUMERICAL ASSESSMENT OF HIGH-FREQUENCY MUTUAL COUPLING BETWEEN SOURCES ON CONVEX SURFACES WITH VARIABLE CURVATURES**

*D. Chatterjee, University of Missouri Kansas City, United States; C.J. Reddy, Applied EM, Inc., United States*

16:20 - 16:40

**SPURIOUS FIELDS SUPPRESSION IN OVERLAPPING DOMAIN DECOMPOSITION METHODS**

*T. Peng, K. Sertel, J. L. Volakis, The Ohio State University, United States*

16:40 - 17:00

**A UNIFORM GEOMETRICAL THEORY OF DIFFRACTION FOR RADIATION AND COUPLING ASSOCIATED WITH ANTENNAS ON A SMOOTH CONVEX IMPEDANCE SURFACE**

*P. H. Pathak, The Ohio State University, United States; K. Phaebua, King Mongkut's Institute of Technology Ladkrabang, Thailand*

17:00 - 17:20

**OPTICAL FIELD ENHANCEMENT FOR HEAT-ASSISTED MAGNETIC RECORDING SYSTEM USING PHOTONIC CRYSTAL WAVEGUIDE**

*O. Watcharakitchakorn, R. Silapunt, King Mongkut's University of Technology Thonburi, Thailand*

**Session 10 - IEEE APWC  
MULTIBAND, WIDEBAND, AND FUNCTIONAL ANTENNAS  
PART I**

**Organized by H. Nakano**

Chairs: H. Iwasaki, H. Nakano

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8:00 - 8:20

**EFFECTS OF DIELECTRIC AND MAGNETIC MATERIALS  
ON ANTENNA PERFORMANCES OF VERY SMALL  
NORMAL-MODE HELICAL ANTENNAS**

*Y. Yamada, N. Michishita, National Defense Academy, Japan;  
K. Ochiyama, NDA, Japan; K. Mouri, NDA, Japan*

8:20 - 8:40

**PERFORMANCES OF UWB ANTENNA AND ARRAY**

*Dau-Chyrh Chang, Chao-Hsiang Liao, Communication  
Research Center, Oriental Institute of Technology, Taiwan*

8:40 - 9:00

**ISSUES AND CHALLENGES OF LTE ANTENNA DESIGNS  
FOR USB-DONGLE DEVICE**

*N. I. Mohamed, T. A. Rahman, C. Y. Leow, Universiti Teknologi  
Malaysia, Malaysia*

9:00 - 9:20

**WEARABLE FINGER DUAL BAND ANTENNA FOR BAN**

*T. Watanabe, H. Iwasaki, Shibaura Institute of Technology,  
Japan*

9:20 - 9:40

**CIRCULARLY POLARIZED SPIRAL ANTENNA USING A  
DOUBLE NEGATIVE PROPERTY**

*H. Nakano, J. Miyake, M. Oyama, Y. Oishi, T. Sakurada,  
J. Yamauchi, Hosei University, Japan*

9:40 - 10:00

**DIELECTRIC LOADING EFFECT ON 140-GHZ LTCC SIW  
SLOT ARRAY ANTENNA**

*Junfeng Xu, Zhi Ning Chen, Xianming Qing, Institute for  
Infocomm Research, Singapore; Wei Hong, Southeast  
University, China*

10:20 - 10:40

**ONE-DIMENSIONAL BEAM SCANNING REFLECTOR  
ANTENNA FOR SMALL SATELLITE APPLICATIONS**

*M. Takikawa, Y. Inasawa, Y. Konishi, Mitsubishi Electric  
Corporation, Japan*

10:40 - 11:00

**NEGATIVE-REFRACTIVE-INDEX TRANSMISSION-LINE  
METAMATERIAL-LOADED DIPOLE ANTENNAS**

*M.A. Antoniadou, University of Queensland, Australia;  
G.V. Eleftheriades, University of Toronto, Canada*

11:00 - 11:20

**DESIGN OF ANTENNAS WITH SPATIAL DIVERSITY FOR WIMAX TERMINALS ON A HIGH-SPEED TRAIN**

*Chi-Fang Huang, Yu-Wei Tien, Tatung University, Taiwan; Chang-Lan Tsai, Industrial Technology Research Institute, Taiwan*

11:20 - 11:40

**SIX-PORT BASED HIGH-RESOLUTION SMART ANTENNA ALIGNMENT SENSOR**

*G. Vinci, F. Barbon, S. Lindner, R. Weigel, A. Koelpin, University of Erlangen-Nuremberg, Germany*

11:40 - 12:00

**UWB ANTENNA WITH MULTIPLE CONTROLLED REJECTION-BANDS**

*N. Guan, R. Hosono, Fujikura Ltd., Japan; K. Yashiro, Chiba Univ., Japan*

12:00 - 12:20

**MODELING AND DESIGN OF 2-ELEMENT DUAL-BAND CERAMIC CHIP HANDSET ANTENNAS**

*A.S. Andrenko, Fujitsu Laboratories LTD., Japan*

13:40 - 14:00

**DIRECTIONAL BROADBAND PLANAR SLOT ANTENNA FED BY DUAL-OFFSET TRI-PLATE LINES ON DOUBLE-LAYER SUBSTRATE IN 20GHZ BAND**

*K. Sakakibara, A. Hasegawa, H. Hori, N. Kikuma, H. Hirayama, Nagoya Institute of Technology, Japan*

14:00 - 14:20

**DESIGN AND BANDWIDTH ENHANCEMENT OF CIRCULARLY POLARIZED APERTURE ANTENNAS USING L-SHAPED PROBE**

*T. Fukusako, S. Yamaura, Kumamoto University, Japan*

14:20 - 14:40

**DESIGN OF DUAL-BAND CIRCULARLY POLARIZED DIELECTRIC RESONATOR ANTENNA USING A HIGHER-ORDER MODE**

*H.S. Ngan, X.S. Fang, K.W. Leung, The State Key Laboratory of Millimeter Waves and Department of Electronic Engineering, City University of Hong Kong, Kowloon, Hong Kong, China*

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Tuesday, September 4, 2012, room VOC North

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**Session 11 - ICEAA  
ELECTROMAGNETIC PROPERTIES OF MATERIALS**

Chairs: A. R. Baghai-Wadji, A. Leicht

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14:40 - 15:00

**DETERMINATION OF DIELECTRIC PERMITTIVITY AND LOSSES UP TO 67 GHZ**

*M. Jenning, S. Fraedrich, S. Mastalerz, D. Plettemeier, TU Dresden, Germany*

15:00 - 15:20

**A POLYNOMIAL APPROACH APPLIED TO THE HODGDON MODEL TO DESCRIBE THE HYSTERESIS LOOPS OF SIFE**

*A. Leicht, J. Fischer, M. Albach, Friedrich-Alexander-University of Erlangen-Nuremberg, Germany*

15:20 - 15:40

**AUTOMATED DIAGONALIZATION OF MAXWELL'S EQUATIONS: THEORY, IMPLICATIONS AND APPLICATIONS**

*A. R. Baghai-Wadji, RMIT University, Australia*

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Tuesday, September 4, 2012, room VOC North

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**Session 12 - ICEEA  
ELECTROMAGNETIC MEASUREMENTS**

Chairs: C. Baer, B. Will

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16:00 - 16:20

**A SIMULATION STUDY TO VERIFY THE EFFECTS OF AIR WAVES IN SEA BED LOGGING FOR SHALLOW WATER**

*A. Shafie, N. Yahya, M. Abdulkarim, Universiti Teknologi PETRONAS, Malaysia*

16:20 - 16:40

**PSEUDO TRANSMISSION MEASUREMENT CONCEPT FOR THE VOLUME FRACTION DETERMINATION OF RICE IN A PNEUMATIC CONVEYING SYSTEM**

*C. Baer, M. Vogt, T. Musch, Ruhr-Universität Bochum, Germany*

16:40 - 17:00

**APPLICATION OF THE THRU-NETWORK-LINE SELF-CALIBRATION METHOD FOR FREE SPACE MATERIAL CHARACTERIZATIONS**

*B. Will, I. Rolfes, Ruhr-University Bochum, Germany*

17:00 - 17:20

**A BACKGROUND AND TARGET SIGNAL SEPARATION TECHNIQUE FOR EXACT RCS MEASUREMENT**

*X. Xu, Beihang University, China*

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Tuesday, September 4, 2012, room VOC North

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**Session 13 - ICEEA  
OPTOELECTRONICS AND PHOTONICS**

Chair: C. Fisher

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17:20 - 17:40

**TRANSIENT SIMULATION OF CYLINDRICAL LASER CAVITIES CONTAINING ACTIVE MEDIA**

*C. Fischer, Universitaet Paderborn, Germany;  
R. Schuhmann, TU Berlin, Germany*



17:40 - 18:00

**LED-SPECTROSCOPY BASED ON MULTI QUANTUM WELL EMITTER**

*M. Degner, H. Ewald, University of Rostock, Germany*

Tuesday, September 4, 2012, room VOC South

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**Session 14 - ICEAA  
IMAGING ARRAYS FOR RADIO ASTRONOMY  
organized by M. Ivashina, R. Maaskant, K. Warnick**

Chairs: M. Ivashina, R. Maaskant, K. Warnick

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8:00 - 8:20

**A BROADBAND 512-ELEMENT FULL CORRELATION IMAGING ARRAY AT VHF (LEDA)**

*L.J. Greenhill, Harvard University, United States;*

*D. Werthimer, University of California Berkeley, United States;*

*G.B. Taylor, University of New Mexico, United States;*

*S.W. Ellingson, Virginia Tech, United States*

8:20 - 8:40

**ASKAP PAF ADE - ADVANCING AN L-BAND PAF DESIGN TOWARDS SKA**

*G. Hampson, A. Macleod, R. Beresford, CSIRO Astronomy and Space Science, Australia; M. Brothers, CSIRO ICT Centre, Australia; A. Brown, CSIRO Astronomy and Space Science, Australia; J. Bunton, C. Cantrall, CSIRO ICT Centre, Australia; R. Chekkala, W. Cheng, R. Forsyth, R. Gough, CSIRO Astronomy and Space Science, Australia; S. Hay, CSIRO ICT Centre, Australia; J. Kanapathippillai, D. Kiraly, M. Leach, N. Morison, S. Neuhold, P. Roberts, CSIRO Astronomy and Space Science, Australia; R. Shaw, CSIRO ICT Centre, Australia; A. Schinckel, M. Shields, J. Tuthill, CSIRO Astronomy and Space Science, Australia*

8:40 - 9:00

**THE MEERKAT ARRAY AND ITS DIGITAL SIGNAL PROCESSOR**

*J. Manley, F. Kapp, SKA-South Africa, South Africa*

9:00 - 9:20

**PROGRESS IN HIGH SENSITIVITY PHASED ARRAY FEEDS FOR LARGE SINGLE-DISH RADIO TELESCOPES**

*K. F. Warnick, T. Webb, M. Adhikari, B. D. Jeffs, M. Elmer, V. Asthana, M. Fuller, BYU, United States; C. Jin, Y. Wu, NAOC, China; A. Roshi, R. Fisher, NRAO, United States*

9:20 - 9:40

**DEVELOPMENT OF MULTI-STAGE FILTER BANKS FOR ASKAP**

*J. Tuthill, G. Hampson, CSIRO Astronomy and Space Science, Australia; J. Bunton, CSIRO ICT Centre, Australia; A. Brown, S. Neuhold, T. Bateman, L. de Souza, CSIRO Astronomy and Space Science, Australia; J. Joseph, CSIRO ICT Centre, Australia*

9:40 - 10:00

**DEVELOPMENT OF A LOW-NOISE ACTIVE BALUN FOR A DUAL-POLARIZED PLANAR CONNECTED-ARRAY ANTENNA FOR ASKAP**

*R. Shaw, Y. Ranga, S. Hay, CSIRO, Australia*

10:20 - 10:40

**SKALA: A LOG-PERIODIC ANTENNA FOR THE SKA**

*Eloy de Lera Acedo, University of Cambridge, United Kingdom*

10:40 - 11:00

**ASTRONOMICAL CALIBRATION AND ANALYSIS OF DATA OBTAINED WITH PHASED-ARRAY FEED RADIO TELESCOPES**

*T.A. Oosterloo, Netherlands Institute for Radio Astronomy, Netherlands*

11:00 - 11:20

**POLARIMETRIC CALIBRATION RESULTS OF AN APERTIF PHASED ARRAY FEED**

*W.A. van Cappellen, S.J. Wijnholds, Netherlands Institute for Radio Astronomy (ASTRON), Netherlands*

11:20 - 11:40

**CALIBRATION AND FIELD FLATTENING FOR SINGLE DISH ASTRONOMICAL PHASED ARRAY FEED RADIO CAMERA IMAGING**

*M. Elmer, B.D. Jeffs, K.F. Warnick, Brigham Young University, United States; D.A. Rosh, J.R. Fisher, National Radio Astronomy Observatory, United States*

11:40 - 12:00

**STOCHASTIC WAVE SENSING WITH LOGARITHMIC PERIODIC CIRCULAR ANTENNA ARRAYS**

*J. Russer, G. Scarpa, P. Lugli, P. Russer, Technical University Munich, Germany*

12:00 - 12:20

**CHARACTERISTIC BASIS FUNCTION PATTERNS -- A NOVEL EXPANSION METHOD FOR THE FAST AND ACCURATE PREDICTION OF ANTENNA ARRAY BEAMS**

*R. Maaskant, M.V. Ivashina, Chalmers, Sweden*

13:40 - 14:00

**EFFICIENT AND ACCURATE EM SIMULATION OF LARGE ARRAY ANTENNAS AND IMAGING SYSTEMS**

*W. Simon, A. Lauer, A. Wien, S. Otto, IMST, Germany*

14:00 - 14:20

**TOWARDS THE UNDERSTANDING OF THE INTERACTION EFFECTS BETWEEN REFLECTOR ANTENNAS AND PHASED ARRAY FEEDS**

*O.A. Lupikov, R. Maaskant, M. Ivashina, Chalmers University of Technology, Sweden*

14:20 - 14:40

**A GENERAL APPROACH TO THE DESIGN OF PLANAR ARRAY ANTENNAS FOR FORMING OF MULTIPLE ORTHOGONAL BEAMS**

*S. P. Skobelev, Radiphyzika, Russia*

14:40 - 15:00

**TOWARDS A UNIFORM EVALUATION OF THE SCIENCE QUALITY OF SKA TECHNOLOGY OPTIONS: POLARIMETRIC ASPECTS**

*T. D. Carozzi, Onsala Space Observatory, Chalmers University, Sweden; M. V. Ivashina, Chalmers University, Sweden*

15:00 - 15:20

**FAST SIMULATION OF FOCAL PLANE ARRAYS MADE OF 3D VIVALDI ANTENNAS**

*R. Sarkis, Univeristé catholique de Louvain, Belgium; Bruce Veidt, NRC, Canada; C. Craeye, Univeristé catholique de Louvain, Belgium*

15:20 - 15:40

**PERFORMANCE EVALUATION OF FAR FIELD PATTERNS FOR RADIO ASTRONOMY APPLICATIONS THROUGH THE USE OF THE JACOBI-BESSEL SERIES**

*A. Young, Stellenbosch University, South Africa; R. Maaskant, M.V. Ivashina, Chalmers University of Technology, Sweden; D.B. Davidson, Stellenbosch University, South Africa*

16:00 - 16:20

**SEVERAL NEW ULTRA-WIDEBAND ANTENNA SYSTEMS FOR RADIO TELESCOPES AND INDUSTRY SENSOR IMAGING PROCESS**

*J. Yang, Chalmers University of Technology, Sweden; J Yin, Norwegian Univ. of Science and Technology (NTNU), Norway; M. Pantaleev, Y. Yu, T. McKelvey, S.S. Fayazi, H.-S. Lui, Chalmers University of Technology, Sweden*

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Tuesday, September 4, 2012, room VOC South

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**Session 15 - ICEAA  
ELECTROMAGNETIC MODELING OF DEVICES AND  
CIRCUITS**

Chairs: F. Gronwald, M. Pereira

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16:20 - 16:40

**SYMMETRICAL RESPONSE FILTER DESIGN APPLYING THE BARTLETT'S THEOREM AND USING RIBLET'S COUPLERS**

*J. R. Montejo-Garai, C.A. Leal-Sevillano, Universidad Politecnica de Madrid, Spain; J.A. Ruiz-Cruz, Universidad Autonoma de Madrid, Spain; J.M. Rebolgar, Universidad Politecnica de Madrid, Spain*

16:40 - 17:00

**DESIGN AND ANALYSIS OF SLOT COUPLED CAVITY FOR WIDE BAND BAND-STOP FILTER APPLICATION**

*S. Das, R. K. Gayen, Indian School of Mines - Dhanbad, India*

17:00 - 17:20

**ON EQUIVALENT CIRCUIT REPRESENTATIONS FOR RADIATING SYSTEMS BY MEANS OF COMPLEX-VALUED NETWORK ELEMENTS**

*F. Gronwald, Hamburg University of Technology, Germany;  
J. Nitsch, S. Tkachenko, Otto-von-Guericke-University  
Magdeburg, Germany*

17:20 - 17:40

**ELECTROMAGNETIC MODELS OF INTEGRATED CIRCUITS WITH COUPLED MAGNETIC CIRCUITS**

*D. Ioan, G. Ciuprina, C.B. Dita, M.I. Andrei, Polytechnic  
University of Bucharest, Romania*

17:40 - 18:00

**SYNTHESIS OF NONUNIFORM TEM-MODE DIRECTIONAL COUPLERS WITH ARBITRARY COUPLING RESPONSE**

*M. R. Pereira, H. M. Salgado, INESC TEC / Faculdade de  
Engenharia da Universidade do Porto, Portugal; J. R. Pereira,  
Instituto de Telecomunicacoes Universidade de Aveiro, Portugal*

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Tuesday, September 4, 2012, room Constantia

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**Session 16 - ICEAA  
COMPUTATIONAL ELECTROMAGNETICS  
organized by R.D. Graglia and D.R. Wilton**

Chairs: R.D. Graglia, D.R. Wilton

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8:00 - 8:20

**NONCONFORMAL FETI-DP METHODS FOR NUMERICAL ANALYSIS OF LARGE-SCALE ELECTROMAGNETIC PROBLEMS**

*M. F. Xue, J. M. Jin, University of Illinois at Urbana-Champaign,  
United States*

8:20 - 8:40

**FAST SOLUTION OF FINITE ELEMENT/BOUNDARY INTEGRAL PROBLEMS EMPLOYING HIERARCHICAL GREEN'S FUNCTION INTERPOLATION COMBINED WITH MULTILEVEL FAST MULTIPOLE METHOD**

*D. T. Schobert, T. F. Eibert, TU Muenchen/HFT, Germany*

8:40 - 9:00

**EFFICIENT TECHNIQUES BASED ON THE CBFM FOR THE ANALYSIS OF ON-BOARD ANTENNAS**

*J. Laviada, M. Rodriguez-Pino, F. Las-Heras, J. Gutierrez-Meana,  
Universidad de Oviedo, Spain*

9:00 - 9:20

**THE METHOD OF MANUFACTURED SOLUTIONS FOR THE VERIFICATION OF MOM CODES**

*R.G. Marchand, D.B. Davidson, Stellenbosch University, South  
Africa*

9:20 - 9:40

**CIRCULANT PRECONDITIONERS FOR DOMAIN INTEGRAL EQUATIONS IN ELECTROMAGNETICS**

*R.F. Remis, Delft University of Technology, Netherlands*

9:40 - 10:00

**ANALYTICAL COMPUTATION OF IMPEDANCE INTEGRALS WITH POWER-LAW GREEN'S FUNCTIONS**

*I. Bogaert, Ghent University, Belgium*

10:20 - 10:40

**COMMENTS ON THE CONSTRUCTION OF NEAR-SINGULARITY CANCELLATION TRANSFORMATIONS FOR TRIANGLE DOMAINS**

*M.M. Botha, University of Stellenbosch, South Africa*

10:40 - 11:00

**CHARACTERISTIC MODE ANALYSIS OF ARBITRARY ELECTROMAGNETIC STRUCTURES USING FEKO**

*D. Ludick, E. Lezar, U. Jakobus, EM Software & Systems - S.A. (Pty) Ltd, South Africa*

11:00 - 11:20

**EFFICIENT ELECTROMAGNETIC CHARACTERIZATION AND OPTIMIZATION OF A 1D RECONFIGURABLE PERIODIC CONFIGURATION IN MICROSTRIP TECHNOLOGY**

*L. Matekovits, Politecnico di Torino, Italy; M. Bercigli, R. Guidi, IDS Ingegneria Dei Sistemi S.p.A., Italy*

11:20 - 11:40

**APPLICATION OF TIME-DOMAIN BIE TO SUB-WAVELENGTH SCATTERING BODIES WITH FINITE CONDUCTIVITY**

*N. Cinosi, M. Bluck, S.P. Walker, Imperial College London, United Kingdom*

11:40 - 12:00

**A COMPARISON OF THE FDTD ALGORITHM IMPLEMENTED ON AN INTEGRATED GPU VERSUS A GPU CONFIGURED AS A CO-PROCESSOR**

*R.G. Ilgner, D.B. Davidson, University of Stellenbosch, South Africa*

12:00 - 12:20

**A SURFACE-INTEGRAL-EQUATION APPROACH TO THE PROPAGATION OF WAVES IN EBG-BASED DEVICES**

*V. Lancellotti, A.G. Tijhuis, Technical University of Eindhoven, Netherlands*

13:40 - 14:00

**SOLUTION OF LARGE-SCALE WIDEBAND EM WAVE SCATTERING PROBLEMS USING FAST FOURIER TRANSFORM AND THE ASYMPTOTIC WAVEFORM EVALUATION TECHNIQUE**

*V. Pham-Xuan, D. Trinh-Xuan, Dublin City University, Ireland; I. De Koster, K. Van Dongen, TU Delft, Netherlands; M. Condon, C. Brennan, Dublin City University, Ireland*

14:00 - 14:20

**EFFICIENCY OF THE NOVEL HYBRID METHODS BASED ON MAGNETIC FIELD INTEGRAL EQUATIONS**

*M.A. Buzova, SONIIR, Russia*

14:20 - 14:40

**NUMERICAL MODELING OF THE RADAR SIGNATURE OF ROCKET EXHAUST PLUMES**

*B.F. Denozière, D.G. Gueyffier, J.S. Simon, ONERA, France*

14:40 - 15:00

**SOMETHING DIFFERENT - CACHING APPLIED TO CALCULATION OF IMPEDANCE MATRIX ELEMENTS**

*A.A. Lysko, Council for Scientific and Industrial Research, South Africa*

15:00 - 15:20

**DESIGN AND CONSTRUCTION OF COMPUTATIONAL TOOLS EXCLUSIVELY BASED ON MAXWELL'S EQUATIONS**

*A. R. Baghai-Wadji, RMIT University, Australia*

15:20 - 15:40

**THE DEVELOPMENT OF HIERARCHICAL BASES OF THE ADDITIVE KIND FOR CORNER SINGULARITIES IN TRIANGULAR CELLS**

*R. D. Graglia, Politecnico di Torino, Italy; A. F. Peterson, Georgia Institute of Technology, Atlanta, GA, USA; L. Matekovits, Politecnico di Torino, Italy*

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Tuesday, September 4, 2012, room Constantia

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**Session 17 - ICEAA  
IMAGING, INVERSION AND OPTIMIZATION**

**Organized by B. de Hon, R. Remis**

Chairs: B. de Hon, R. Remis

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16:00 - 16:20

**OPTIMIZATION OF HIGH-SPEED ELECTROMAGNETIC SYSTEMS WITH ACCURATE PARAMETRIC MACROMODELS USING SEQUENTIAL SAMPLING OF THE DESIGN SPACE**

*K. Chemmangat Manakkal Cheriya, F. Ferranti, T. Dhaene, L. Knockaert, IBCN-IBBT, Ghent University, Belgium*

16:20 - 16:40

**ON DETECTION OF SHADOWED TARGETS IN AXISYMMETRIC CONFIGURATIONS**

*A. Shafalyuk, P.D. Smith, E.D. Vinogradova, Macquarie University, Australia*

16:40 - 17:00

**GEOMETRICAL OPTICS AND THE FINITE-DIFFERENCE TIME-DOMAIN METHOD**

*J. M. Arnold, University of Glasgow, United Kingdom*

17:00 - 17:20

**NONLINEAR INVERSION APPLIED TO ACOUSTIC TOMOGRAPHY**

*K.W.A. van Dongen, M.D. Verweij, Delft University of Technology, Netherlands*

17:20 - 17:40

**USING NONLINEAR DISTORTION TO OUR BENEFIT: HIGHER HARMONIC IMAGING OF MEDICAL ULTRASOUND**

*M.D. Verweij, Delft University of Technology, Netherlands; K.W.A. van Dongen, Delft University of Technology, Netherlands*

17:40 - 18:00

**NONLINEAR MODIFIED NEWTON MINIMIZATION OF REDUCED-ORDER OBJECTIVE FUNCTIONS FOR TWO-PARAMETER INVERSION PROBLEMS**

*R.F. Remis, Delft University of Technology, Netherlands*

Tuesday, September 4, 2012, room Stellenbosch

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**Session 18 - ICEAA-EEIS  
EM THEORY**

Chairs: A.K. Mishra, G. Perona

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8:00 - 8:20

**COMPUTATIONAL MODELING OF WATER DROPLET DEFORMATIONS IN STRONG ELECTRIC FIELDS**

*H. Songoro, E. Gjonaj, T. Weiland, TU-Darmstadt - TEMF, Germany*

8:20 - 8:40

**DUAL-FREQUENCY GPS SINGLE-POINT POSITIONING ERROR DURING THE IONOSPHERIC IRREGULARITY**

*Jinghua Li, Guanyi Ma, National Astronomical Observatories, Chinese Academy of Sciences, China*

8:40 - 9:00

**RADIO WAVE EMISSION DUE TO ROCK FRACTURE AND THE ESTIMATION OF THE EMITTED ENERGY**

*T. Takano, J. Kato, M. Hirashima, K. Saegusa, Nihon University, Japan*

9:00 - 9:20

**A STANDALONE APPLICATION TO MONITOR THE STABILITY OF A LOW COST MAINTENANCE FREE X-BAND MINI WEATHER RADAR, USING GROUND CLUTTER ECHOES**

*S. Bertoldo, L. Bracco, R. Notarpietro, C. Lucianaz, O. Rorato, M. Allegretti, G. Perona, Politecnico di Torino, Italy*

9:20 - 9:40

**SCATTERING OF A SPHERICAL WAVE BY THE END-FACE OF A THREE-DIMENSIONAL WAVEGUIDE SYSTEM**

*A. Komiyama, Osaka Electro-Communication University, Japan*

9:40 - 10:00

**COMMUNICATION THEORY AND RESONANCES ON ELECTROMAGNETIC SYSTEMS**

*J.M. Velázquez-Arcos, J. Granados-Samaniego, C.A. Vargas, Universidad Autónoma Metropolitana, Mexico*

10:20 - 10:40

**AN EXACT SPECTRAL REPRESENTATION OF THE WAVE EQUATION FOR PROPAGATION OVER A TERRAIN**

*A. Chabory, C. Morlaas, R. Douvenot, B. Souny, ENAC, France*

10:40 - 11:00

**MATRIX SPLIT-STEP RESOLUTION FOR PROPAGATION BASED ON AN EXACT SPECTRAL FORMULATION**

*R. Douvenot, C. Morlaas, A. Chabory, B. Souny, ENAC/Telecom Lab, France*

11:00 - 11:20

**A NOVEL RADIO-FREQUENCY PLASMA PROBE FOR MONITORING SYSTEMS IN DIELECTRIC DEPOSITION PROCESSES**

*C. Schulz, T. Styrnoll, M. Lapke, J. Oberrath, R. Storch, P. Awakowicz, R.P. Brinkmann, T. Musch, T. Mussenbrock, I. Rolfes, Ruhr-Universität Bochum, Germany*

11:20 - 11:40

**ELECTRICALLY SMALL CIRCULARLY POLARIZED SPHERICAL ANTENNA WITH AIR CORE**

*O.S. Kim, Technical University of Denmark, Denmark*

11:40 - 12:00

**MODELLING THE INTERACTION OF ELECTRON CLOUDS AND MICROWAVES**

*E. Sorolla, EPFL-STI-IEL-LEMA, Switzerland; F. Zimmermann, CERN, Switzerland; M. Mattes, EPFL-STI-IEL-LEMA, Switzerland*

12:00 - 12:20

**REVIEW OF RADAR SIGNAL ATTENUATION DUE TO SAND AND DUST STORMS**

*S. Alhuwaimel, KACST, Saudi Arabia; A.K. Mishra, M.R. Inggs, University of Cape Town, South Africa*

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Tuesday, September 4, 2012, room Stellenbosch

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**Session 19 - ICEAA  
WIRELESS POWER TRANSMISSION  
organized by G. Franceschetti, N. Shinohara**

Chairs: G. Franceschetti, N. Shinohara

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13:40 - 14:00

**MICROWAVE POWER TRANSMISSION. A NEW SCIENCE IS BORN**

*G. Franceschetti, University Federico II, Italy*

14:00 - 14:20

**PARTIAL DRIVE TECHNIQUES TO SIMPLIFY A SPACETENNA BY REDUCING THE DRIVEN ELEMENTS OF AN ARRAY**

*T. Takano, H. Hosono, K. Saegusa, Nihon University, Japan*



14:20 - 14:40

**MICROWAVE POWER TRANSMISSION EXPERIMENT  
USING BREADBOARD MODEL FOR SMALL SCIENTIFIC  
SATELLITE TOWARD SPS**

*K. Tanaka, K. Maki, JAXA, Japan; M Takahashi, Tokyo University  
of Science, Japan; S. Sasaki, JAXA, Japan*

14:40 - 15:00

**STUDY ON POSITION ESTIMATION OF ANTENNA  
PANELS FOR PANEL-STRUCTURE SOLAR POWER  
SATELLITE / STATION WITH PILOT SIGNAL**

*T. Ishikawa, N. Shinohara, Kyoto University, Japan*

15:00 - 15:20

**DESIGN AND OPTIMIZATION OF EFFICIENT RECTENNA  
SYSTEMS FOR SPACE SOLAR POWER APPLICATIONS**

*G. Franceschetti, P. Rocca, F. Robol, A. Massa, ELEDIA Research  
Center - University of Trento, Italy*

15:20 - 15:40

**RESONANT WIRELESS POWER TRANSFER:  
INVESTIGATION OF RADIATING RESONANCES**

*M. Dionigi, DIEI University of Perugia, Italy;  
G. Franceschetti, Università Federico II, Napoli, Italy;  
M. Mongiardo, DIEI University of Perugia, Italy*

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Tuesday, September 4, 2012, room VOC South

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**Session 20 - ICEAA  
ELECTROMAGNETICS FOR MEDICAL APPLICATIONS  
organized by K. Ito**

Chairs: K.P. Esselle, K. Ito

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16:00 - 16:20

**MICROWAVE HEATING FOR TREATMENT OF BILE  
DUCT CARCINOMA - EVALUATIONS ON INFLUENCE OF  
METALLIC STENT**

*K. Saito, H. Itakura, M. Takahashi, K. Ito, Chiba University, Japan*

16:20 - 16:40

**NEW CONCEPTS IN THE DESIGN OF PHASED ARRAYS  
FOR HYPERTHERMIA**

*F. Bardati, Università Roma Tor Vergata, Italy; P. Palumbo,  
Università di Bologna, Italy; P. Tognolatti, Università dell'Aquila,  
Italy*

16:40 - 17:00

**DESIGN OF IMPLANTED ANTENNA HAVING PLANAR  
STRUCTURE FOR MONITORING BIOLOGICAL  
INFORMATION**

*K. Kawasaki, M. Takahashi, K. Saito, K. Ito, Chiba University,  
Japan*

17:00 - 17:20

**PERFORMANCE EVALUATIONS ON RFID TAG ANTENNA FOR MANAGING SURGICAL INSTRUMENT**

*T. Matsumura, M. Takahashi, K. Saito, E. Yamamoto, K. Ito, Chiba University, Japan*

17:20 - 17:40

**A MINIATURIZED IMPLANTABLE PIFA ANTENNA FOR INDOOR WIRELESS TELEMETRY**

*M. S. Islam, K. P. Esselle, Macquarie University, Australia; D. Bull, BCS Innovations, Australia; P. M. Pilowsky, Macquarie University, Australia*

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Tuesday, September 4, 2012, room Paarl

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**Session 21 - EEIS**

**COMPLEXITY AND UNCERTAINTY IN EMC STUDIES**

**organized by C. Christopoulos**

Chairs: C. Christopoulos, K.K. Stavrakakis

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8:40 - 9:00

**SPATIALLY RESOLVED MEASUREMENT OF RADIATED ELECTROMAGNETIC INTERFERENCE FOR MAPPING OF NOISE SOURCES AND AMBIENT NOISE CANCELLATION**

*J. Russer, Technical University of Munich, Germany; A. Frech, S. Braun, GAUSS Instruments, Munich, Germany; P. Russer, Technical University of Munich, Germany*

9:00 - 9:20

**FAST PARAMETER SWEEPS FOR THE CALCULATION OF S-PARAMETERS IN ELECTROMAGNETIC FIELD SIMULATIONS**

*K.K. Stavrakakis, Technische Universität Darmstadt, Germany; T. Wittig, CST AG, Germany; W. Ackermann, T. Weiland, Technische Universität Darmstadt, Germany*

9:20 - 9:40

**DYNAMIC MODELLING OF THE ELECTROMAGNETIC BEHAVIOUR OF CAVITIES WITH RANDOMLY POSITIONED BOUNDARIES**

*M. Panitz, BAE Systems, United Kingdom; C. Christopoulos, University of Nottingham, United Kingdom*

9:40 - 10:00

**EXTERNAL RADIATION OF COMPLEX CAVITIES DESCRIBED BY THE RANDOM COUPLING MODEL**

*G. Gradoni, T. M. Antonsen, S. M. Anlage, E. Ott, University of Maryland, United States*

Tuesday, September 4, 2012, room Paarl

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**Session 22 - ICEAA**  
**MODELLING OF COMPLEX ELECTROMAGNETIC DEVICES**  
**organized by D.I.L. de Villiers and P. Meyer**

Chairs: D.I.L. de Villiers, P. Meyer

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10:20 - 10:40

**WAFFLE-IRON FILTERS WITH OBLIQUE BOSS PATTERNS**

*P. Meyer, T. Stander, Stellenbosch University, South Africa; P.W. Van der Walt, W. Steyn, Reutech Radar Systems, South Africa*

10:40 - 11:00

**FAST OPTIMIZATION OF MICROWAVE FILTERS USING SURROGATE-BASED OPTIMIZATION METHODS**

*K. Chemmangat, D. Deschrijver, I. Couckuyt, T. Dhaene, L. Knockaert, Ghent University - IBBT, Belgium*

11:00 - 11:20

**HIGHER ORDER MODAL INTERACTIONS IN CONICAL POWER COMBINERS**

*D.I.L. de Villiers, Stellenbosch University, South Africa*

11:20 - 11:40

**THE DESIGN OF THE MEERKAT L-BAND FEED**

*R. Lehmsiek, I.P. Theron, EMSS Antennnas, South Africa*

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Wednesday, September 5, 2012, room VOC North

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**Session 23 - IEEE APWC**  
**WIRELESS NETWORKS**

Chairs: A.A. Lysko, J du Toit

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8.00 - 8.20

**MODULATION AND CODING INDEPENDENT PEAK -TO-AVERAGE POWER RATIO REDUCTION AND DIGITAL PREDISTORTION TECHNIQUE FOR MULTI-CARRIER TRANSMITTERS**

*I. Mrissa, INRS-EMT, University du Quebec, Canada; F. Ghannouchi, iRadio Lab, University of Calgary, Canada*

8:20 - 8:40

**ROBUST TIME AND FREQUENCY SYNCHRONIZATION FOR OFDM SYSTEMS WITH MAXIMUM FLEXIBILITY**

*C. Bluemm, C. Heller, EADS Innovation Works, Germany; R. Weigel, University of Erlangen-Nuremberg, Germany*

8:40 - 9:00

**A MULTIPURPOSE NODE FOR LOW COST WIRELESS SENSOR NETWORK**

*O. Rorato, C. Lucianaz, S. Bertoldo, M. Allegretti, G. Perona, Politecnico di Torino, Italy*

9:00 - 9:20

**TOWARDS AN ULTRA-LOW-POWER ELECTRONICALLY CONTROLLABLE ARRAY ANTENNA FOR WSN**

*A.A. Lysko, Council for Scientific and Industrial Research, South Africa*

9:20 - 9:40

**INVESTIGATION OF HANDOVER TECHNIQUES IN A IPV6 MOBILE NETWORK**

*J. Pieterse, R. Wolhuter, University of Stellenbosch, South Africa;*

9:40 - 10:00

**ERASURE RESILIENT CHANNEL CODING STRATEGY FOR DISTRIBUTED SENSOR NETWORKS**

*J. du Toit, R. Wolhuter, Stellenbosch University, South Africa*

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Wednesday, September 5, 2012, room VOC North

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**Session 24 - IEEE APWC  
CHANNEL MODELING**

Chairs: P. Degauque, T. Tjelta

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10:20 - 10:40

**CHANNEL MEASUREMENTS IN HARSH RF PROPAGATION ENVIRONMENTS FOR OVER-THE-AIR PERFORMANCE EVALUATION OF WIRELESS DEVICES**

*Hong Fang, Xin Bian, Xin Zhou, Ke Liu, Haining Zhao, Division of Electronics and Information Technology, National Institute of Metrology, China*

10:40 - 11:00

**SPECULAR PATH ESTIMATION ERRORS WITH ESPRIT, SAGE, AND RIMAX IN THE PRESENCE OF DENSE MULTIPATH**

*E. Tanghe, L. Martens, W. Joseph, Ghent University / IBBT, Belgium; D. P. Gaillot, M. Liénard, P. Degauque, University of Lille, France*

11:00 - 11:20

**A MEASUREMENT-BASED PATH LOSS MODEL FOR WIRELESS LINKS IN MOBILE AD-HOC NETWORKS (MANET) OPERATING IN THE VHF AND UHF BAND**

*J. Fischer, FAU Erlangen-Nürnberg, Germany; M. Grossmann, W. Felber, M. Landmann, A. Heuberger, Fraunhofer IIS, Germany*

11:20 - 11:40

**RADIOWAVE PROPAGATION AND DEPLOYMENTS ASPECTS OF GIGABIT CAPACITY RADIO LINKS OPERATING AT 70/80 GHZ**

*T. Tjelta, D. V. Tran, T. Tanem, Telenor, Norway*

11:40 - 12:00

**ANALYSIS OF ANTENNA LOCATION AND POLARIZATION ON INDOOR CELLULAR MIMO PERFORMANCE**

*P.A. van Jaarsveld, G. Mayhew-Ridgers, Vodacom, South Africa*

12:00 - 12:20

**ATTENUATION MODEL FOR INDOOR MULTIPATH BROADBAND PLC CHANNELS**

*C.T. Mulangu, T.J.O. Afullo, N. M. Ijumba, University of KwaZulu Natal, South Africa*

**Session 25 - ICEAA**  
**FRONTIERS IN INTEGRAL EQUATION METHODS**  
**organized by I. Bogaert and P. Lagasse**

Chairs: I. Bogaert, P. Lagasse

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13:40 - 14:00

**COMPUTING GREEN'S FUNCTIONS FOR  
BIANISOTROPIC MATERIALS**

*I. Bogaert, Ghent University, Belgium*

14:00 - 14:20

**FORMULATING MATRIX EQUATIONS IN THE CONTEXT  
OF MOM BY USING THE DIPOLE MOMENT (DM)  
METHOD INSTEAD OF GREEN'S FUNCTIONS**

*R. Mittra, K. Panayappan, C. Pelletti, G. Bianconi, The  
Pennsylvania State University, United States*

14:20 - 14:40

**HYBRID IE-DDM-MLFMA WITH FORWARD-BACKWARD  
METHOD FOR CONDUCTING BODY OF TRANSLATION**

*Ming Jiang, Jun Hu, Ran Zhao, Zai-ping Nie, Univ. of Electro Sci.  
and Tech. of China, China*

14:40 - 15:00

**PARTIAL ELEMENT EQUIVALENT CIRCUIT MODELS  
IN THE SOLUTION OF THE ELECTRIC FIELD INTEGRAL  
EQUATION**

*F. Ferranti, Ghent University - IBBT, Belgium; G. Antonini,  
Università degli Studi dell'Aquila, Italy; K. Chemmangat  
Manakkal Cheriya, L. Knockaert, T. Dhaene, Ghent University  
- IBBT, Belgium*

15:00 - 15:20

**OPTIMIZATION OF INVISIBILITY CLOAKS BY SURFACE  
INTEGRAL EQUATION METHOD**

*J.M. Taboada, J. Rivero, L. Landesa, University of Extremadura,  
Spain; M.G. Araújo, F. Obelleiro, University of Vigo, Spain*

15:20 - 15:40

**ON THE MIXED DISCRETIZATION OF THE TIME DOMAIN  
MAGNETIC FIELD INTEGRAL EQUATION**

*H.A. Ulku, King Abdullah University of Science and Technology,  
Saudi Arabia; I. Bogaert, Ghent University, Belgium; K. Cools,  
University of Nottingham, United Kingdom; F. P. Andriulli,  
TELECOM Bretagne, France; H. Bagci, King Abdullah University  
of Science and Technology, Saudi Arabia*

16:00 - 16:20

**DESIGN OF OPTICAL NANOANTENNAS WITH THE  
SURFACE INTEGRAL EQUATION METHOD OF MOMENTS**

*M. G. Araújo, D. M. Solís, Univ. of Vigo, Spain; J. Rivero,  
J. M. Taboada, Univ. of Extremadura, Spain; F. Obelleiro,  
Univ. of Vigo, Spain; L. Landesa, Univ. of Extremadura, Spain*

**Session 26 - IEEE APWC  
ANTENNAS AND ARRAYS - I**

Chairs: S. Barbin, L. Matekovits

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8:00 - 8:20

**ACTIVE INTEGRATED PHOTONIC ANTENNA ARRAY**

*N. Neumann, R. Trieb, W.-S. Benedix, D. Plettemeier, TU  
Dresden, Germany*

8:20 - 8:40

**BROADBAND DUAL-BAND DUAL-POLARIZED  
OVERLAPPED ANTENNA ELEMENT**

*Zhu Sun, Shun-Shi Zhong, Shanghai University, China;  
K.P. Esselle, Macquarie University, Australia; J. Guo, Y. Cai,  
CSIRO, Australia*

8:40 - 9:00

**DESIGN OF HIGH ISOLATION DUAL-POLARIZED  
DIELECTRIC RESONATOR ANTENNA**

*Shun-Shi Zhong, Ling-Bing Kong, Shanghai University, China*

9:00 - 9:20

**ANTENNA SYSTEM LAYOUT IN HIGH CAPACITY  
GEOSTATIONARY COMMUNICATION SATELLITES**

*L.S. Lawal, NIGCOMSAT Ltd/University of Sussex, Nigeria;  
C.R. Chatwin, University of Sussex, United Kingdom*

9:20 - 9:40

**A MODIFIED HELICAL SHAPED DEPLOYABLE ANTENNA  
FOR CUBESATS**

*J. Costantine, California State University Fullerton, United  
States; Y. Tawk, University of New Mexico, United States;  
S. Moth, California State University Fullerton, United States;  
C. G. Christodoulou, University of New Mexico, United States;  
S. E. Barbin, University of Sao Paulo, Brazil*

9:40 - 10:00

**CONFORMAL DOUBLE PRINTED DIPOLE ANTENNA**

*Min Guo, Shun-Shi Zhong, Shanghai University, China*

10:20 - 10:40

**LIMITATIONS OF THE ELECTROMAGNETIC ISOLATION  
FOR MULTI-ANTENNA SYSTEMS ON SMALL TERMINALS  
WITH CAPACITIVE COUPLING ELEMENTS**

*M. Pelosi, O.N. Alrabadi, O. Franek, G.F. Pedersen, Aalborg  
Universitet, Denmark*

10:40 - 11:00

**COMPACT LOW PROFILE UHF SWITCHED-BEAM  
ANTENNA FOR ADVANCED TYRE MONITORING  
SYSTEMS**

*G. Lasser, Vienna University of Technology, Austria;  
L.W. Mayer, [www.lwm-research.at](http://www.lwm-research.at), Austria;  
C.F. Mecklenbräuker, Vienna University of Technology, Austria*

11:00 - 11:20

**HIGH GAIN MICROSTRIP PATCH ANTENNA ARRAY USING MULTIPLE SUPERSTRATE LAYERS FOR DSRC APPLICATIONS**

*B.R. Franciscatto, A.C. Souza, IMEP-LAHC, UMR 5130 (CNRS-GRENOBLE INP- UJF-Univ. de Savoie), France;*

*C. Defay, T. T. Trang, Multitoll Solutions SAS, France; T. P. Vuong, IMEP-LAHC, UMR 5130 (CNRS-GRENOBLE INP- UJF-Univ. de Savoie), France*

11:20 - 11:40

**CURRENT EMC ISSUES AND CONCERNS IN NUCLEAR POWER PLANTS**

*P.F. Keebler, EPRI, United States; H.S. Berger, D.M. Evans, TEM Consulting, United States*

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Wednesday, September 5, 2012, room VOC South

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**Session 27 - EEIS**

**HPEM: ENVIRONMENTS, MODELING AND MEASUREMENTS organized by D.V. Giri**

Chairs: R. L. Gardner, D.V. Giri

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11:40 - 12:00

**REQUIREMENTS FOR A DETAILED MODEL OF THE HIGH-FREQUENCY CONTENT OF THE LIGHTNING RETURN STROKE**

*R. L. Gardner, Consultant, United States*

12:00 - 12:20

**METAMATERIAL WAVEGUIDE MODEL OF A RETURN STROKE CHANNEL**

*N.G. Lehtinen, M.B. Cohen, Stanford University, United States; U.S. Inan, Koc University, Turkey*

13:40 - 14:00

**REVERBERATION CHAMBER AND CURRENT INJECTION CABLE SYSTEM STUDY IN FREQUENCY AND TIME DOMAINS**

*J. A. Andriambelason, H. C. Reader, P. G. Wiid, A. R. Botha, Univ. of Stellenbosch, South Africa*

14:00 - 14:20

**THEORETICAL FOUNDATION FOR HYBRID EFFECTS MODELS**

*R. L. Gardner, Consultant, United States*

14:20 - 14:40

**NOVEL SOLUTION FOR CONFORMAL TRANSFORMATION**

*D. V. Giri, PRO-TECH, United States*

14:40 - 15:00

**IN-FLIGHT LIGHTNING DAMAGE ASSESSMENT SYSTEM ILDAS: TESTS ON-GROUND AND IN-FLIGHT**

*A.P.J. van Deursen, TU Eindhoven, Netherlands;*

*A. de Boer, M. Bardet, NLR, Netherlands;*

*F. Flourens, Airbus France, France*

15:00 - 15:20

**APPLICATION OF IEC SC 77C STANDARDS TO IEMI PROTECTION**

*W.A. Radasky, Metatech Corporation, United States*

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Wednesday, September 5, 2012, room VOC South

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**Session 28 - ICEAA  
EMC/EMI/EMP**

Chairs: R. L. Gardner, D.V. Giri

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15.20 - 15.40

**ELECTROMAGNETIC ANALYSIS OF THE RADIATED FIELD BY GAS INSULATED SWITCHGEARS FOR FAULT DETECTION**

*A. Tacchini, D. Grossi, Reggio Emilia Innovazione, Italy;  
L. Vincetti, M. Maini, Università di Modena e Reggio Emilia, Italy;  
S. Serra, M. Fattori, TechImp Systems, Italy; L. Sandrolini, Università degli Studi di Bologna, Italy*

16.00 - 16.20

**THE CHARACTERIZATION OF A LAB-MADE GTEM CHAMBER**

*H. Xavier de Araujo, Unicamp, Brazil; S. E. Barbin, USP, Brazil;  
L. C. Kretly, Unicamp, Brazil*

16:20 - 16:40

**CHOKeless POWER-LINE FILTERS WITH INTEGRAL SURGE PROTECTION**

*D.M. Evans, H.S. Berger, TEM Consulting, United States;  
P.F. Keebler, EPRI, United States*

16:40 - 17:00

**DESIGN AND SIMULATION OF A MODE SUPPRESSED GTEM CELL**

*D. Poughè, Reutlingen University of Applied Sciences, Germany;  
B. Maier, Technical University Berlin, Germany*

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Wednesday, September 5, 2012, room Constantia

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**Session 29 - ICEAA  
RECENT ADVANCES IN INTEGRAL EQUATION AND FINITE ELEMENT METHODS**

**organized by J. Jin and B. Shanker**

Chairs: J. Jin, B. Shanker

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8:00 - 8:20

**A FLEXIBLE FRAMEWORK FOR THE SOLUTION TO SURFACE SCATTERING PROBLEMS USING INTEGRAL EQUATIONS**

*D. Dault, N. V. Nair, B. Shanker, L. C. Kempel, Michigan State University, United States*

8:20 - 8:40

**DIRECTIVE SOURCE INTEGRAL EQUATION**

*A. Boag, Tel Aviv University, Israel*



8:40 - 9:00

**SURFACE-PRECONDITIONED AIM-ACCELERATED  
SURFACE-VOLUME INTEGRAL EQUATION SOLUTION  
FOR BIOELECTROMAGNETICS**

*F. Wei, A. E. Yilmaz, University of Texas at Austin, United States*

9:00 - 9:20

**EXPLICIT SOLUTION OF THE TIME DOMAIN MAGNETIC  
FIELD INTEGRAL EQUATION USING A PREDICTOR-  
CORRECTOR SCHEME**

*H.A. Ulku, H. Bagci, King Abdullah University of Science  
and Technology, Saudi Arabia; E. Michielssen, University of  
Michigan, United States*

9:20 - 9:40

**EFFICIENT SOLUTION OF SCATTERING FROM MULTIPLE  
BODIES OF REVOLUTION**

*Jun Hu, Yu-ke Li, Zai-ping Nie, Univ. of Electro Sci. and Tech. of  
China, China*

9:40 - 10:00

**FINITE ELEMENT ANALYSIS OF ANTENNAS AND  
PHASED ARRAYS IN THE TIME DOMAIN**

*J. M. Jin, University of Illinois at Urbana-Champaign, United  
States*

10:20 - 10:40

**HIGH ORDER NON-CONFORMING MULTI-ELEMENT  
DISCONTINUOUS GALERKIN METHOD FOR TIME-  
DOMAIN ELECTROMAGNETICS**

*C. Durochat, S. Lanteri, NACHOS project-team, INRIA Sophia  
Antipolis - Méditerranée research center, France; C. Scheid,  
Jean-Alexandre Dieudonné Mathematics Laboratory, France*

10:40 - 11:00

**A NOVEL HYBRID TECHNIQUE FOR MUTUAL COUPLING  
MODELING OF ANTENNAS WITH STRONGLY  
OVERLAPPED MINIMUM-SPHERES**

*J.F. Izquierdo, J. Rubio, Universidad de Extremadura, Spain;  
J. Zapata, Universidad Politécnica de Madrid, Spain*

11:00 - 11:20

**ON THE DEVELOPMENT OF GLOBAL PLASMA-  
IONOSPHERE FDTD ALGORITHMS FOR  
ELECTROMAGNETIC CALCULATIONS IN THE EARTH-  
IONOSPHERE SYSTEM**

*Y. Yu, Institute of High Performance Computing, A\*STAR,  
Singapore; J. J. Simpson, University of New Mexico, United  
States; E. Li, Institute of High Performance Computing, A\*STAR,  
Singapore*

11:20 - 11:40

**ANALYSIS AND NUMERICAL SOLUTION OF  
ELECTROMAGNETIC SCATTERING FROM CAVITIES**

*A. Wood, AFIT, United States*

**Session 30 - IEEE APWC  
MULTIBAND, WIDEBAND, AND FUNCTIONAL ANTENNAS  
PART II**

**Organized by H. Nakano**

Chairs: H. Nakano, O. Quevedo-Teruel

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11:40 - 12:00

**RECONFIGURABLE MULTIBAND PATCH ANTENNA FOR  
GROUND PENETRATING RADAR APPLICATIONS**

*A. Amiri, K. F. Tong, K. Chetty, University College London, UK*

12:00 - 12:20

**ON THE USE OF SURFACE PLASMONS FOR THE DESIGN  
OF UWB LEAKY WAVE ANTENNAS**

*O. Quevedo-Teruel, Y. Hao, Queen Mary University of London,  
United Kingdom*

13:40 - 14:00

**A TWO-ARM ARCHIMEDEAN SPIRAL ANTENNA WITH  
BENT ENDS**

*M. Tanabe, M. Matsumoto, Y. Masuda, Toshiba Corporation,  
Japan*

14:00 - 14:20

**A WIDEBAND UNIDIRECTIONAL ANTENNA ARRAY  
ELEMENT WITH STABLE RADIATION PATTERN**

*M. Gardill, R. Weigel, A. Koelpin, University of Erlangen-  
Nuremberg, Institute of Electronics Engineering, Germany*

14:20 - 14:40

**BROADBAND METAMATERIAL CRLH ZOR ANTENNA  
BURIED UNDER THE TOP-SURFACE OF THE AIRCRAFT  
FOR A LOW-PROFILE AND C-BAND COMMUNICATION**

*S.-G. Mok, S. Kahng, K. Kahng, I. Yang, Univ. of Incheon, Korea,  
South*

14:40 - 15:00

**WIDEBAND ANALYSIS OF A STOP BAND FILTER AND A  
RESONATOR AT THZ FREQUENCIES**

*J. Shibayama, Y. Uchizono, J. Yamauchi, H. Nakano, Hosei  
University, Japan*

15:00 - 15:20

**WIDEBAND BASE STATION ANTENNA COMPOSED  
OF ULTRA LOW PROFILE INVERTED L ANTENNA FOR  
MOBILE PHONE**

*M. Taguchi, S. Sato, Nagasaki University, Japan*

15:20 - 15:40

**DUAL-BAND FLAT ANTENNA FOR POLARIZATION  
DIVERSITY WITH HIGH ISOLATION**

*C. Phongcharoenpanich, K. Boonying, S. Kosulvit, King  
Mongkut's Institute of Technology Ladkrabang, Thailand;  
T. Laohapensaeng, Mae Fah Luang University, Thailand*

16:00 - 16:20

**PMC CHARACTERISTICS OF CAPACITANCE GRID WITH METAL PLATE**

*S. Makino, Kanazawa Institute of Technology, Japan;*

*T. Moroya, Kanazawa Technical College, Japan;*

*S. Betsudan, K. Itoh, K. Noguchi, T. Hirota, Kanazawa Institute of Technology, Japan*

16:20 - 16:40

**A NEW BROADBAND TRAPEZOIDAL FLAT MONOPOLE ANTENNA**

*B. Heydari, A. Islamdoost, Asian Elite Co., Iran*

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Wednesday, September 5, 2012, room Stellenbosch

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**Session 31 - ICEAA  
NETWORK METHODS APPLIED TO ELECTROMAGNETIC  
FIELD COMPUTATION  
organized by P. Russer**

Chairs: P. Russer, S. Wane

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8:00 - 8:20

**EMBEDDED STRUCTURES MODELLED BY  
DIGITAL FILTER INTERFACES IN TIME-DOMAIN  
ELECTROMAGNETIC MODELS**

*R. Vongurai, C. Christopoulos, D.W.P. Thomas, University of Nottingham, United Kingdom*

8:20 - 8:40

**NOISE THEORY OF MULTI-PORT NETWORKS AND  
APPLICATIONS TO PHASED ARRAY FEEDS, MRI COIL  
ARRAYS, AND MIMO COMMUNICATIONS**

*K. F. Warnick, Brigham Young University, United States*

8:40 - 9:00

**SYSTEM IDENTIFICATION PROCEDURE IN MICROWAVE  
STRUCTURE MODELING APPLICATIONS**

*A. Gorbunova, A. Baev, Y. Kuznetsov, Moscow Aviation Institute (National Research University), Russia*

9:00 - 9:20

**BRUNES EQUIVALENT CIRCUIT MODEL FOR COUPLED  
MONOLITHIC INTEGRATED MILLIMETER-WAVE  
FOLDED ANTENNAS**

*A. Baev, A. Gorbunova, Y. Kuznetsov, Moscow Aviation Institute (National Research University), Russia; F. Mukhtar, J.A. Russer, P. Russer, Technische Universität München, Germany; D. Bajon, Université de Toulouse, France; S. Wane, NXP-Semiconductors, France*

9:20 - 9:40

**LOSSY MICROWAVE CIRCUITS – SYSTEMATIC SYNTHESIS  
OF EQUIVALENT LUMPED ELEMENT MODEL BASED ON  
EXTENDED FOSTER CANONICAL EXPANSION**

*N. Dončov, B. Stošić, University of Niš, Serbia; J. Russer, Technical University Munich, Institute for Nanoelectronics, Germany; T. Asenov, B. Milovanović, University of Niš, Serbia*

9:40 - 10:00

**NETWORK MODELING OF A MAGNETICALLY BIASED GRAPHENE SHEET IN AN ARBITRARY CYLINDRICAL WAVEGUIDE**

*D. Sounas, C. Caloz, École Polytechnique de Montréal, Canada*

10:20 - 10:40

**METHODOLOGY FOR GENERATION OF BRUNE'S EQUIVALENT CIRCUIT MODELS FOR LINEAR PASSIVE RECIPROCAL MULTI-PORTS**

*F. Mukhtar, J. A. Russer, Technical University of Munich, Germany; Y. Kuznetsov, Theoretical Radio Engineering Department, Russia; P. Russer, Technical University of Munich, Germany*

10:40 - 11:00

**REFLECTION PHASE METHOD FOR INKJET PRINTED ARTIFICIAL MAGNETIC CONDUCTOR REFLECTOR DESIGN ON PAPER SUBSTRATE**

*S. Kim, M. M. Tentzeris, J. Cooper, Georgia Institute of Technology, United States*

11:00 - 11:20

**EVOLUTION, CHALLENGES, PERSPECTIVES OF THZ, GRAPHENE AND CARBONE NANO-TUBES IN SILICON-BASED TECHNOLOGIES**

*S. Wane, NXP, France; D. Bajon, ISAE, France; H. Baudrand, RCEM, France*

11:20 - 11:40

**ELECTROMAGNETIC MODELING AND ANALYSIS OF SUBSTRATE RELATED SLOW-WAVE MECHANISMS FOR APPLICATIONS FROM MILLIMETER-WAVE TO OPTICAL FREQUENCY DOMAINS**

*D. Bajon, ISAE, France; S. Wane, NXP, France; S. Massenot, ISAE, France*

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Wednesday, September 5, 2012, room Stellenbosch

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**Session 32 - ICEEA  
BIOELECTROMAGNETICS  
organized by J. Simpson**

Chairs: M. Hasan, P. Meaney

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11:40 - 12:00

**PRACTICAL APPLICATIONS OF EM EXPOSURE RESEARCH**

*M. L. Birch, M. J. Van Wyk, EMSS Consulting (Pty) Ltd., South Africa*

12:00 - 12:20

**EFFECT OF THE VARIATION IN POPULATION ON THE WHOLE BODY AVERAGE SAR OF PERSONS EXPOSED TO VEHICLE MOUNTED ANTENNAS**

*W. Simon, IMST, Germany; G. Bit-Babik, Motorola Solutions, United States*

13:40 - 14:00

**MAGNETIC BIOSENSOR SYSTEM TO DETECT BIOLOGICAL TARGETS**

*F. Li, C. Gooneratne, J. Kosel, King Abdullah University of Science and Technology, Saudi Arabia*

14:00 - 14:20

**ULTRAFAST 3D MICROWAVE TOMOGRAPHY UTILIZING THE DIRECT DIPOLE APPROXIMATION**

*P. Meaney, Dartmouth College, United States;  
T. Grzegorzczuk, Delpsi, LLC, United States;  
E. Attardo, Istituto Superiore Mario Boella, Italy;  
K. D. Paulsen, Dartmouth College, United States*

14:20 - 14:40

**MICROWAVE BREAST TUMOR SENSING AND TARGETING USING MULTISWARM CONTRAST-AGENT-LOADED BACTERIAL NANOROBOTS**

*Y. Chen, Newcastle University, United Kingdom;  
P. Kosmas, King's College London, United Kingdom*

14:40 - 15:00

**A FEASIBILITY STUDY OF MICROJETS APPLIED TO BREAST CANCER DETECTION**

*H. Seidfaraji, University of New Mexico, United States;  
J. J. Simpson, University of Utah, United States;  
M. Hasan, University of New Mexico, United States*

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Wednesday, September 5, 2012, room Stellenbosch

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**Session 33 - ICEAA  
EM APPLICATIONS TO BIOMEDICINE**

Chairs: M. Hasan, P. Meaney

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15:00 - 15:20

**EXPERIMENTAL PERFORMANCE OF COMPACT UWB ANTENNA FOR BREAST CANCER SCREENING**

*S. K. Padhi, ICRAR/CIRA, Australia; A. Mase, N. Ito, D. Zhang, ASTEC, Kyushu University, Japan*

15:20 - 15:40

**SPATIAL SAMPLING REQUIREMENTS FOR MULTISTATIC BREAST MICROWAVE RADAR IMAGING**

*D. Flores-Tapia, O. Maizlish, University of Manitoba, Canada;  
S. Pistorius, University of Manitoba/CancerCare Manitoba, Canada*

16:00 - 16:20

**FEASIBILITY STUDY OF TUMOR MORPHOLOGY CLASSIFICATION VIA CONTRAST-ENHANCED UWB BREAST IMAGING – A POLE-ZERO ANALYSIS**

*S. Ahmad, Y. Chen, Newcastle University, United Kingdom*

16:20 - 16:40

**PATHOGEN DETECTION USING SINGLE TUNNEL JUNCTION SENSOR (STJ) WITH MAGNETIC NANO PARTICLES**

*M. I. Hussein, M. I. Shekfa, Y. Haik, United Arab Emirates University, United Arab Emirates*

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Thursday, September 6, 2012, room VOC North

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**Session 34 - ICEEA  
FIELDS AND WAVES**

**organized by L. Klinkenbusch, K. Langenberg**

Chairs: L. Klinkenbusch, K. Langenberg

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8:00 - 8:20

**CHARACTERIZATION OF ANTENNAS IN THE TIME-DOMAIN**

*A. Shlivinski, Ben-Gurion University of the Negev, Israel*

8:20 - 8:40

**ADVANCED NETWORK MODELING FOR INDUCTIVELY COUPLED ANTENNAS IN AMBIENT ASSISTED LIVING SYSTEMS**

*R. Kazemzadeh, W. John, W. Mathis, Institute of Theoretical Electrical Engineering, Germany*

8:40 - 9:00

**INVESTIGATION OF SMART ANTENNAS USING RF-MEMS BASED TUNABLE CRLH-TRANSMISSION LINES**

*T. Kim, L. Vietzorreck, TU Muenchen, Germany*

9:00 - 9:20

**NUMERICAL SYSTEM ANALYSIS OF ROTATING ANTENNAS AND ROTATING SCATTERERS APPLIED TO NAVIGATION AND RADAR SYSTEMS**

*G. Greving, W.-D. Biermann, R. Mundt, NAVCOM Consult, Germany*

9:20 - 9:40

**COMPLEX-SOURCE BEAM DIFFRACTION BY AN ACOUSTICALLY SOFT OR HARD CIRCULAR CONE**

*M. Katsav, E. Heyman, Tel-Aviv University, Israel;  
L. Klinkenbusch, Kiel University, Germany*

9:40 - 10:00

**RECONSTRUCTION OF CYLINDRICAL METAL TARGETS USING THEIR MONOSTATIC RCS**

*H. Shirai, Y. Hiramatsu, Chuo University, Japan*

10:20 - 10:40

**ADVANCED ELECTROMAGNETIC FIELD SOLVERS FOR BIO-MEDICAL APPLICATIONS**

*J. Gao, Technische Universitaet Darmstadt, Germany;  
I. Munteanu, M. Strydom, CST AG, Darmstadt, Germany;  
T. Weiland, Technische Universitaet Darmstadt, Germany;  
T. Wittig, CST AG, Darmstadt, Germany*

10:40 - 11:00

**EFFICIENT EXTRACTION OF FIELD PATTERNS IN OPEN RESONATORS FROM TIME DOMAIN CALCULATIONS**

*C. Classen, R. Schuhmann, TU Berlin, Germany*

11:00 - 11:20

**SKEWON-AXION MEDIUM AND SHDB CONDITIONS**

*I.V. Lindell, A. Sihvola, Aalto University, Finland*

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Thursday, September 6, 2012, room VOC North

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**Session 35 - ICEAA  
ANTENNAS AND ARRAYS - II**

Chairs: W.P. du Plessis, A.V. Raisanen

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11:20 - 11:40

**A PARTIALLY REFLECTING SURFACE WITH POLARIZATION CONVERSION FOR CIRCULARLY POLARIZED ANTENNAS WITH HIGH DIRECTIVITY**

*B.A. Zeb, K.P. Esselle, Macquarie University, Australia*

11:40 - 12:00

**END-FIRE ARRAY ENHANCEMENT WITH GRADIENT-BASED NUMERICAL OPTIMIZATION**

*S. Koziel, S. Ogurtsov, Reykjavik University, Iceland*

12:00 - 12:20

**SLL, ACTIVE ELEMENTS AND AVAILABLE ELEMENTS OF UNIFORMLY-EXCITED LINEAR THINNED ARRAYS**

*W.P. du Plessis, Council for Scientific and Industrial Research (CSIR), South Africa*

13:40 - 14:00

**ULTRA-WIDEBAND ARRAY SYNTHESIS USING THE IFT TECHNIQUE**

*W.P. du Plessis, Council for Scientific and Industrial Research (CSIR), South Africa*

14:00 - 14:20

**BROADBAND PRINTED ANTENNA FOR RADIOFREQUENCY ENERGY HARVESTING**

*L. Vincetti, M. Maini, E. Pinotti, L. Larcher, S. Scorcioni, A. Bertacchini, Università di Modena e Reggio Emilia, Italy; D. Grossi, A. Tacchini, Reggio Emilia Innovazione scarl, Italy*

14:20 - 14:40

**ASSESSMENT OF THE SENSITIVITY OF THE SOUTH AFRICAN KAT-7 AND MEERKAT/SKA RADIO TELESCOPE REFLECTOR ANTENNAS**

*A. Young, Stellenbosch University, South Africa; M.A.B. Terada, University of Brasilia, Brazil; D.I.L. de Villiers, D.B. Davidson, Stellenbosch University, South Africa*

14:40 - 15:00

**EVALUATION OF THE QUIET ZONE GENERATED BY A REFLECTARRAY ANTENNA**

*D. R. Prado, M. Arrebola, M. R. Pino, F. Las-Heras, Universidad de Oviedo, Spain*

15:00 - 15:20

**DUAL-REFLECTOR ANTENNA WITH A REFLECTARRAY  
SUBREFLECTOR FOR WIDE BEAM SCANNING RANGE AT  
120GHZ**

*M. Arrebola, Universidad de Oviedo, Spain;*

*J. A. Encinar, Universidad Politecnica de Madrid, Spain;*

*R. Cahill, Queen's University Belfast, United Kingdom;*

*G. Toso, European Space Agency, Netherlands*

15:20 - 15:40

**ANTENNAS FOR ELECTRONIC BEAM STEERING AND  
FOCUSING AT MILLIMETER WAVELENGTHS**

*A.V. Raisanen, J. Ala-Laurinaho, D. Chicherin, Z. Du,*

*A. Generalov, A. Karttunen, D. Lioubtchenko, J. Mallat,*

*A. Tamminen, T. Zvolensky, Aalto University, Finland*

16:00 - 16:20

**CANDIDATE WIRE SPIRAL ANTENNAS FOR THE SKA  
RADIO TELESCOPE**

*A. Jiwani, S. Padhi, M. Waterson, P. J. Hall, ICRAR/CIRA,*

*Australia; J. G. bij de Vaate, ASTRON, Netherlands*

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Thursday, September 6, 2012, room VOC South

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**Session 36 - ICEAA  
RECENT ADVANCES IN COMPUTATIONAL EM  
organized by R. Maaskant and R. Mittra**

Chairs: R. Maaskant, R. Mittra

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8:00 - 8:20

**RADIATION OF APERTURES ARRAYS MOUNTED ON  
LARGE CONDUCTING STRUCTURES THROUGH A  
CHARACTERISTIC BASIS FUNCTION (CBF) APPROACH**

*M. De Gregorio, G. Tiberi, D. Bianchi, A. Monorchio, Univ. of  
Pisa, Italy*

8:20 - 8:40

**SOLUTION OF SCATTERING PROBLEMS INVOLVING  
DIELECTRIC BODIES WITH THE CHARACTERISTIC BASIS  
FUNCTION METHOD**

*J. Laviada, M. Rodriguez-Pino, F. Las-Heras, Universidad de  
Oviedo, Spain*

8:40 - 9:00

**FAST ANALYSIS OF GAP WAVEGUIDES USING THE  
CHARACTERISTIC BASIS FUNCTION METHOD AND THE  
PARALLEL-PLATE GREEN'S FUNCTION**

*R. Maaskant, P. Takook, P.-S. Kildal, Chalmers, Sweden*

9:00 - 9:20

**NUMERICAL ANALYSIS OF FINITE ANTENNA ARRAYS  
USING THE DOMAIN GREEN'S FUNCTION METHOD**

*D.J. Ludick, Univ. Stellenbosch, South Africa; U. Jakobus, EM*

*Software & Systems - S.A. (Pty) Ltd, South Africa; D.B. Davidson,  
Univ. Stellenbosch, South Africa*



9:20 - 9:40

**GENERAL FLOQUET MODE CHARACTERIZATION OF PHASED ARRAY ANTENNAS USING ASYMPTOTIC TECHNIQUES**

*Hsi-Tseng Chou, Nan-Wei Chen, Yuan Ze University, Taiwan*

9:40 - 10:00

**DEDICATED MOM BASIS FUNCTION SCHEME FOR PLASMONIC APPLICATIONS AT THE NANO-SCALE**

*G.A.E. Vandenbosch, X. Zheng, N. Verellen, V. Valev, V. Moshchalkov, KU Leuven, Belgium*

10:20 - 10:40

**TABULATED INTERACTION METHOD FOR ELECTROMAGNETIC WAVE PROPAGATION PREDICTION IN RURAL AND MOUNTAINOUS AREAS**

*D. Trinh-Xuan, C. Brennan, Dublin City University, Ireland*

10:40 - 11:00

**EM MODELING OF METAL PIPE BASED UHF RFID TAGS ACTIVATED BY R/W ANTENNA**

*A.S. Andrenko, Fujitsu Laboratories LTD., Japan*

11:00 - 11:20

**A FDTD SOLUTION TO THE MAXWELL-SCHRODINGER COUPLED MODEL AT THE MICROWAVE RANGE**

*P. Turati, Y. Hao, Queen Mary University of London, United Kingdom*

11:20 - 11:40

**A NEW TECHNIQUE FOR ANALYZING PERIODIC STRUCTURES WITH ARBITRARY THREE-DIMENSIONAL ELEMENTS**

*R. Mittra, R. K. Arya, The Pennsylvania State University, United States*

11:40 - 12:00

**CLOAKING A MICROSTRIP ANTENNA: INTEGRAL EQUATION MODELING**

*C.A. Valagiannopoulos, Aalto University, Finland; N.L. Tsitsas, Aristotle University of Thessaloniki, Greece*

12:00 - 12:20

**FAST TRANSIENT ANALYSIS OF CLOAKING STRUCTURES**

*A. Bhattacharya, D. Gonzalez-Ovejero, C. Craeye, Universite Catholique de Louvain, Belgium*

**Session 37 - IEEE APWC  
MULTI-BAND AND UWB ANTENNAS - I  
organized by J. Joubert, W. Odendaal**

Chairs: J. Joubert, W. Odendaal

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13:40 - 14:00

**DESIGN OF MULTI-BAND FEED HORNS FOR SPACE APPLICATIONS**

*G. Addamo, O.A. Peverini, G. Virone, R. Tascone, IEIT-CNR, Italy; P. Cecchini, R. Ravanelli, Thales Alenia Space Italy, Italy*

14:00 - 14:20

**DESIGNING MULTI-BAND AND HIGH BANDWIDTH ANTENNAS WITH HETEROGENEOUS SUBSTRATES**

*W. G. Whittow, C. C. Njoku, J. C. Vardaxoglou, Loughborough University, United Kingdom; J. Joubert, University of Pretoria, South Africa*

14:20 - 14:40

**HYBRID ELLIPTIC TEM HORN WITH INTERNAL FINS**

*J.A.G. Malherbe, University of Pretoria, South Africa*

14:40 - 15:00

**ON THE FIDELITY OF ULTRA-WIDEBAND ANTENNAS**

*S. Sczyslo, I. Rolfes, Ruhr-Universität Bochum, Germany; T. Kaiser, University of Duisburg-Essen, Germany*

15:00 - 15:20

**A PRACTICAL 50:1 BANDWIDTH PCB-LPDA ANTENNA FOR MEERKAT RFI STUDIES**

*P.G. Wiid, K.D. Palmer, P.S. Van der Merwe, H.C. Reader, Stellenbosch University, South Africa*

15:20 - 15:40

**INCREASING THE GAIN OF A SEMICIRCULAR SLOT UWB ANTENNA USING AN FSS REFLECTOR**

*Y. Ranga, CSIRO, Australia; K. P. Esselle, Macquarie University, Australia; L. Matekovits, Politecnico di Torino, Italy; S. Hay, CSIRO, Australia*

16:00 - 16:20

**MINIATURE BODY-MATCHED DOUBLE-RIDGED HORN ANTENNAS FOR BIOMEDICAL UWB IMAGING**

*F. Scotto di Clemente, R. Stephan, TU Ilmenau, Germany; U. Schwarz, BMW Group, Germany; M.A. Hein, TU Ilmenau, Germany*

16:20 - 16:40

**COMPARISON OF THE SURFACE RESISTANCE OF CONDUCTIVE SHEETS WITH DIFFERENT SURFACE FINISHES**

*O.B. Jacobs, EMSS-Antennas, South Africa*

16:40 - 17:00

**A DUAL-POLARIZED RIDGED HORN ANTENNA**

*P.H. van der Merwe, J.W. Odendaal, J. Joubert, University of Pretoria, South Africa*

Thursday, September 6, 2012, room VOC South

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**Session 38 - IEEE APWC  
MULTI-BAND AND UWB ANTENNAS - II**

Chairs: J. Joubert, W. Odendaal

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17:00 - 17:20

**ANTENNA DESIGN USING SURROGATE MODELS AND  
ADJOINT SENSITIVITY**

*S. Koziel, S. Ogurtsov, Reykjavik University, Iceland*

17:20 - 17:40

**CAN ULTRAWIDEBAND ANTENNAS BE MINIATURIZED  
EFFECTIVELY BY DIELECTRIC LOADING?**

*Y. Shi, A.K. Amert, K.W. Whites, South Dakota School of Mines  
and Technology, United States*

17:40 - 18:00

**DESIGN AND ANALYSIS OF WAVEGUIDE SLOT  
DOUBLETS FOR DUAL BAND OR NEARLY -  
OMNIDIRECTIONAL RADIATION PROPERTIES**

*R. K. Gayen, S. Das, Indian School of Mines - Dhanbad, India*

Thursday, September 6, 2012, room Constantia

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**Session 39 - IEEE APWC  
ANTENNAS AND PROPAGATION,  
SYSTEMS AND APPLICATIONS  
organized by D. Baker and J. Cloete**

Chairs: D. Baker, J. Cloete

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8:00 - 8:20

**BOREHOLE RADAR IMAGING IN TACTICAL SUPPORT OF  
MINING IN VERY NARROW STOPES**

*I.M. Mason, Univ. Sydney, Australia; J.H. Cloete, Univ.  
Stellenbosch, South Africa; K.D. Palmer, Univ. Stellenbosch,  
South Africa*

8:20 - 8:40

**INSIGHTS INTO FACTORS CONTRIBUTING TO THE  
OBSERVABILITY OF A SUBMARINE AT PERISCOPE  
DEPTH BY MODERN RADAR  
PART 1 - HIGH RESOLUTION MEASUREMENTS**

*F. Anderson, K. Naicker, J.C. Mocke, CSIR DPSS, South Africa*

8:40 - 9:00

**INSIGHTS INTO FACTORS CONTRIBUTING TO THE  
OBSERVABILITY OF A SUBMARINE AT PERISCOPE  
DEPTH BY MODERN RADAR  
PART 2 - EM SIMULATION OF MAST RCS IN A REALISTIC  
SEA SURFACE ENVIRONMENT**

*J.C. Smit, J.E. Cilliers, CSIR DPSS, South Africa*

9:00 - 9:20

**DESIGN OF COST EFFECTIVE ANTENNAS FOR  
INSTRUMENTATION RADARS**

*L. Botha, CSIR, DPSS, South Africa*

9.20 - 9.40

**PLANAR SLOTTED WAVEGUIDE ARRAYS FOR MARINE APPLICATIONS**

*W. Steyn, Reutech Radar Systems, South Africa*

9:40 - 10:00

**THE POWER DENSITY IN THE RADIATING NEAR FIELD REGION OF DIRECTIVE ANTENNAS**

*P.W. Van der Walt, Reutech Radar Systems, Stellenbosch University, South Africa*

10:20 - 10:40

**PRACTICAL ASPECTS OF THE DIRECTION FINDING ACCURACY OF COMPACT WIDEBAND ARRAYS FOR V/ UHF FREQUENCIES**

*U. Trautwein, Medav GmbH, Germany; D. Baker, SAAB EDS, South Africa; M. Kaeske, R. S. Thomae, TU Ilmenau, Germany*

10:40 - 11:00

**VARIATIONS ON LOOP AND ADCOCK ARRAY TOPOLOGIES FOR IMPROVED RADIO DIRECTION FINDING PERFORMANCE**

*C.A.W. Vale, Poynting Antennas, South Africa*

11:00 - 11:20

**A COMPACT 1 TO 18 GHZ PLANAR SPIRAL ANTENNA FOR INTERFEROMETER AND OTHER DIRECTION FINDING APPLICATIONS**

*D.E. Baker, J.B. du Toit, Saab EDS, South Africa*

11:20 - 11:40

**VALIDATION OF A COMPUTATIONAL ELECTROMAGNETIC MODEL OF A BOEING 707 AIRCRAFT BY COMPARISON TO SCALE MODEL MEASUREMENTS**

*B. Jacobs, D.E. Baker, Saab EDS, South Africa*

11:40 - 12:00

**DESIGN AND DEVELOPMENT OF AN 8 TO 12 GHZ CIRCULARLY POLARIZED TWO ELEMENT HORN ANTENNA ARRAY WITH HIGH ISOLATION**

*J.B. du Toit, D.E. Baker, A.J. Booysen, Saab EDS, South Africa*

12:00 - 12:20

**THE MULTI-OCTAVE BANDWIDTH-CAVITY BACKED SINUOUS ANTENNA – A DESIGN REVIEW**

*J.H. Cloete, Stellenbosch University, South Africa; T. Sickel, Magus (Pty) Ltd, South Africa*

**Session 40 - ICEEA**  
**NANO-ELECTROMAGNETICS: NOVEL MATERIALS,**  
**PHENOMENA AND DEVICES**

**organized by C. Caloz**

Chairs: C. Caloz, T. Rozzi

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13:40 - 14:00

**FINITE-DIFFERENCE TIME-DOMAIN STUDIES OF  
PLASMA RESONATING STRUCTURES**

*Y. Yu, E. Li, Institute of High Performance Computing, A\*STAR,  
Singapore*

14:00 - 14:20

**ADVANCED TECHNIQUES FOR THE INVESTIGATION  
OF THE COMBINED ELECTROMAGNETIC-QUANTUM  
TRANSPORT PHENOMENA IN CARBON NANODEVICES**

*L. Pierantoni, D. Mencarelli, T. Rozzi, Università Politecnica delle  
Marche, Italy*

14:20 - 14:40

**QUANTUM DYNAMICS OF CIRCUITS WITH MEMORY  
CAPACITORS AND INDUCTORS**

*G. Scarpa, J. Russer, P. Lugli, P. Russer, Technical University  
Munich, Germany*

14:40 - 15:00

**STUDY OF THE RADIATION EFFICIENCY OF NANO-DIPOLES**

*G. A. E. Vandenbosch, Z. Ma, KU Leuven, Belgium*

15:00 - 15:20

**NEW OPPORTUNITIES IN ELECTROMAGNETICS WITH  
NANOTECHNOLOGIES**

*D. Sounas, L.-P. Carignan, C. Caloz, École Polytechnique de  
Montréal, Canada*

15:20 - 15:40

**NUMERICAL EVALUATION OF RF GAS IONIZATION  
EFFECTS IN MICRO-AND NANO-SCALE DEVICES**

*A. Semnani, A. Venkatraman, A. Alexeenko, D. Peroulis, Purdue  
University, United States*

16:00 - 16:20

**SIGNAL AMPLIFICATION IN A SYNCHRONIZED FIELD  
EMISSION NEMS**

*T. Barois, S. Perisanu, P. Poncharal, P. Vincent, S. Purcell, A. Ayari,  
LPMCN, France*

16:20 - 16:40

**HIGH FREQUENCY CHARACTERIZATION OF CARBON  
NANOTUBE AND GRAPHENE MATERIALS**

*H. Xin, University of Arizona, United States*

16:40 - 17:00

**INKJET PRINTING OF GRAPHENE THIN FILMS FOR  
WIRELESS SENSING APPLICATIONS**

*T. Le, V. Lakafofis, T. Thai, Z. Lin, M. Tentzeris, Georgia Institute  
of Technology, United States*

17:00 - 17:20

**THZ PERIODIC SURFACES TO ENHANCE  
SPECTROSCOPIC MEASUREMENTS**

*W-G. Yeo, V. Sanphuang, N. K. Nahar, J. L. Volakis, The Ohio State University, United States*

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Thursday, September 6, 2012, room Constantia

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**Session 41 - ICEAA  
EM APPLICATIONS TO NANOTECHNOLOGY**

Chairs: C. Caloz, T. Rozzi

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17:20 - 17:40

**A STUDY OF NEAR FIELD TRANSDUCER PERFORMANCE  
AND DEGRADATION BY LOCAL SURFACE PLASMON  
RESONANCE IN HEAT-ASSISTED MAGNETIC  
RECORDING SYSTEM**

*R. Silapunt, O. Watcharakitchakorn, King Mongkut's University of Technology Thonburi, Thailand*

17:40 - 18:00

**INVESTIGATION ON LOCALIZED SURFACE PLASMON  
RESONANCE OF DIFFERENT NANO-PARTICLES FOR  
BIO-SENSOR APPLICATIONS**

*D. Mortazavi, A. Z. Kouzani, Deakin University, Australia;  
L. Matekovits, Politecnico di Torino, Italy*

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Thursday, September 6, 2012, room Stellenbosch

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**Session 42 - ICEAA  
FINITE METHODS  
organized by M.M. Botha, T. Rylander**

Chair: M.M. Botha

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8:20 - 8:40

**PERFECTLY MATCHED LAYERS VIA TRANSFORMATION  
ELECTROMAGNETISM FOR THE COMPUTATION OF  
QUASI-MODES**

*A. Nicolet, F. Zolla, B. Vial, G. Demésy, M. Commandré, Institut Fresnel, France*

8:40 - 9:00

**EFFICIENT CALCULATION OF COUPLING MATRICES FOR  
A DECOUPLED FE/BIE FORMULATION**

*F. Boeykens, H. Rogier, Ghent University, Belgium; J. Van Hese, J. Sercu, T. Boonen, Agilent Technologies, Belgium*

9:00 - 9:20

**NEAR-FIELD TO FAR-FIELD TRANSFORMS USING PDE  
BASED METHODS**

*A. J. Otto, N. Marais, D. B. Davidson, University of Stellenbosch, South Africa*

9:20 - 9:40

**A BOUNDARY CONFORMAL DISCONTINUOUS GALERKIN APPROACH FOR TRANSIENT ELECTRO-QUASISTATIC PROBLEMS WITH MOVING BOUNDARIES**

*A. Froehlcke, E. Gjonaj, T. Weiland, TU Darmstadt, Germany*

9:40 - 10:00

**FDTD ON A LEBEDEV GRID FOR ANALYZING MAGNETIZED FERRITES**

*M. D. Nauta, M. E. Potter, M. Okoniewski, University of Calgary, Canada*

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Thursday, September 6, 2012, room Stellenbosch

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**Session 43 - ICEAA  
ADVANCED ELECTROMAGNETICS  
organized by E. Marx, A. Osipov**

Chair: A. Osipov

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10:20 - 10:40

**GENERAL PROPERTIES OF COMPLEX WAVES**

*A.D. Yaghjian, Research Consultant, United States;  
R.A. Shore, Research Consultant, United States*

10:40 - 11:00

**MECHANISMS OF HIGH-FREQUENCY SCATTERING FROM IMPEDANCE BODIES WITH UNIT RELATIVE SURFACE IMPEDANCE**

*A.V. Osipov, Microwaves and Radar Institute, German Aerospace Center (DLR), Germany*

11:00 - 11:20

**OPTICAL BEHAVIOR OF AN ANTENNA IMMERSSED IN A HYPERBOLIC DOME MADE OF DNG METAMATERIAL**

*P.L.E. Uslenghi, University of Illinois at Chicago, USA*

11:20 - 11:40

**CYLINDRICAL RESONATORS PARTIALLY FILLED WITH A DNG METAMATERIAL SECTOR**

*V.G. Daniele, R.D. Graglia, G. Lombardi, Politecnico di Torino, Italy; P.L.E. Uslenghi, University of Illinois at Chicago, USA*

11:40 - 12:00

**DIELECTRIC-COATED PEC CYLINDERS WHICH DO NOT SCATTER ELECTROMAGNETIC WAVES**

*C. A. Valagiannopoulos, P. Alitalo, S. Tretyakov, Aalto University, Finland*

12:00 - 12:20

**MICROWAVE CHARACTERIZATION OF A SINGLE MULTI-WALL CARBON NANOTUBE**

*A. Katsounaros, J. Zhang, Y. Hao, Queen Mary University of London, United Kingdom*

**Session 44 - ICEAA**  
**MATHEMATICAL ADVANCES IN ELECTROMAGNETICS**  
**organized by J. Arnold and P. Smith**

Chairs: J. Arnold, P. Smith

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13:40 - 14:00

**A FULLY THREE-DIMENSIONAL SIZE-INDEPENDENT  
PARALLELEPIPEDAL RESONATOR PARTIALLY FILLED  
WITH DNG METAMATERIAL**

*P.L.E. Uslenghi, University of Illinois at Chicago, United States*

14:00 - 14:20

**ON AN ELECTROMAGNETIC INVERSE SOURCE  
PROBLEM FOR THE EXCITATION OF A SPHERICAL  
MEDIUM**

*N.L. Tsitsas, Department of Informatics, Aristotle University of  
Thessaloniki, Greece*

14:20 - 14:40

**CYLINDRICAL FDTD GRID-COMPATIBLE GREEN'S  
FUNCTIONS**

*O. Markish, R. Kastner, Tel Aviv University, Israel*

14:40 - 15:00

**FINITE-DIFFERENCE GREEN'S FUNCTION DIAKOPTICS  
- UNLIMITED STABLE LOOKBACK SCHEMES FOR NON-  
TRIVIAL PROBLEMS**

*B.P. de Hon, Eindhoven University of Technology, Netherlands;  
J.M. Arnold, University of Glasgow, United Kingdom*

15:00 - 15:20

**THE SUM-OVER-PATHS REPRESENTATION OF DISCRETE  
GREEN'S FUNCTIONS**

*J.M. Arnold, University of Glasgow, United Kingdom*

15:20 - 15:40

**TIME-DOMAIN MODELLING OF ANTENNAS AND  
REFLECTORS WITH EXACT ABSORBING BOUNDARY  
CONDITIONS**

*P.D. Smith, O. Shafalyuk, Macquarie University, Australia*

16:00 - 16:20

**WAVE SCATTERING BY AXISYMMETRIC ARBITRARILY  
SHAPED CAVITIES WITH INSERTIONS**

*E. D. Vinogradova, A. Shafalyuk, Macquarie University,  
Australia*



**Session 45 - ICEAA-EEIS**  
**EFFECTS OF EM PULSES ON DIGITAL SYSTEMS**  
**organized by T. Clarke and D. Erricolo**

Chairs: D. Beetner, T. Clarke

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16:20 - 16:40

**A PRACTICAL APPROACH TO THE SIMULATION OF EM PULSE EFFECTS ON COMPLEX AND LARGE ELECTRICAL SYSTEMS**

*N. E. Islam, University of Missouri, United States; P. Kirawanich, Mahidol University, Thailand; S. Yakura, AFRL, United States; H. Al Saif, University of Missouri, United States; J. Agee, R. E. Smalley Institute for Nanoscale Science and Technology, United States*

16:40 - 17:00

**MODELING OF RADIO-FREQUENCY EFFECTS ON A MICROCONTROLLER**

*T. Clarke, D. Dietz, D. French, Air Force Research Laboratory, United States*

17:00 - 17:20

**MODELING ELECTROMAGNETIC COUPLING TO INTEGRATED CIRCUITS**

*D. G. Beetner, J. Zhang, Missouri University of Science and Technology, United States; J. Koo, Intel Corp., United States; R. Moseley, S. Herrin, Freescale Semiconductor, Inc., United States; D. Pommerenke, Missouri University of Science and Technology, United States*

17:20 - 17:40

**DIRECT POWER INJECTION OF MICROCONTROLLERS IN PCB ENVIRONMENTS**

*R.M. Henderson, D. McMasters, University of Texas at Dallas, United States; D. French, T.J. Clarke, Air Force Research Laboratory, United States*

17:40 - 18:00

**COUPLING OF EXTERNAL RADIATION TO CIRCUITRY INSIDE COMPLEX EM ENVIRONMENTS**

*G. Gradoni, T. M. Antonsen, S. M. Anlage, E. Ott, University of Maryland, United States*

Thursday, September 6, 2012, room Paarl

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**Session 46 - IEEE APWC  
SPECIAL SESSION  
CELEBRATING SIXTY YEARS OF GEOMETRICAL THEORY  
OF DIFFRACTION**

**organized by Y. Rahmat-Samii, J.L. Volakis**

Chairs: Y. Rahmat-Samii, J.L. Volakis

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8:00 - 8:20

**A REVIEW OF SOME UTD DEVELOPMENTS – PAST AND PRESENT**

*P. H. Pathak, The Ohio State University, United States;*

*M. Albani, G. Carluccio, University of Siena, Italy*

8:20 - 8:40

**HIGH-FREQUENCY DIFFRACTION BY ANISOTROPIC IMPEDANCE WEDGES: A REVIEW**

*G. Manara, P. Nepa, University of Pisa, Italy*

8:40 - 9:00

**DIFFRACTION BY IMPEDANCE STRUCTURES AND HIGHER ORDER BOUNDARY CONDITIONS: A REVIEW**

*J. L. Volakis, Ohio State University, United States*

9:00 - 9:20

**GTD AND PTD AT DTU**

*O. Breinbjerg, Technical University of Denmark, Denmark*

9:20 - 9:40

**DISCUSSION OF PHYSICAL OPTICS SURFACE INTEGRATION FOR DEEP INTERPRETATION OF GTD**

*M. Ando, P. Lu, T. Kohama, Tokyo Institute of Technology, Japan*

9:40 - 10:00

**GTD, UTD, UAT AND STD: A HISTORICAL REVISIT**

*Y. Rahmat-Samii, UCLA, United States*

**Short Course on  
BALUN DESIGNS FOR RF AND MICROWAVE  
APPLICATIONS**

8:20-12:20

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**Instructor**

*Johannes H. Cloete*

*Department of Electrical and Electronic Engineering,  
University of Stellenbosch, South Africa*

A wide selection of important physical topologies is presented with emphasis on baluns for antennas. Many of the topologies are also useful in amplifiers and oscillators. The balun equivalent circuits are developed to exhibit fundamental principles – such as symmetry and shielding – which underpin the balance to unbalance transition and isolation mechanisms. Design methodologies are presented to meet balance, impedance matching and efficiency bandwidth specifications.

Physical examples are exhibited of baluns for resonant antennas such as the circularly polarized turnstile; multi-octave bandwidth LPD and sinuous antennas; and frequency independent equiangular and Archimedes spiral antennas with absorbing cavities.

A complete list of key references for all the topologies is given, including some which are obscure or forgotten in the modern literature.

Copies of presentation slides will be provided.

**Short Course on  
PRACTICAL ASPECTS OF EMC  
FOR ENGINEERS**

8:20-12:20

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**Instructor**

*Christos Christopoulos*

*School of Electrical and Electronic Engineering,  
University of Nottingham, UK*

This is an introductory level short course covering practical issues in EMC design. The treatment will suit EMC practitioners and also those who are relatively new to the field. Mathematical analysis is kept to a minimum and therefore the material is accessible to a wide range of people. Topics to be covered include:

- Introduction to EMC
- EMI sources, coupling paths and effects of EMI
- Practical issues in EMC design (stray components, differential- and common-mode currents, radiation and cross-talk, pulse rise-time and bandwidth, shielding segregation and grounding, etc.)
- EMC measurements and standards
- Relation of EMC to Signal Integrity
- Conclusions and suggestions for self study

Copies of presentation slides will be provided.

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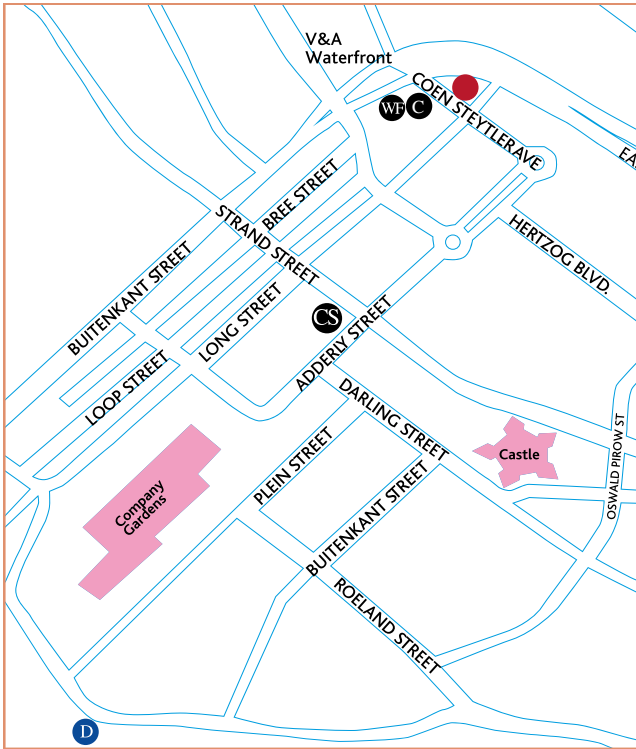
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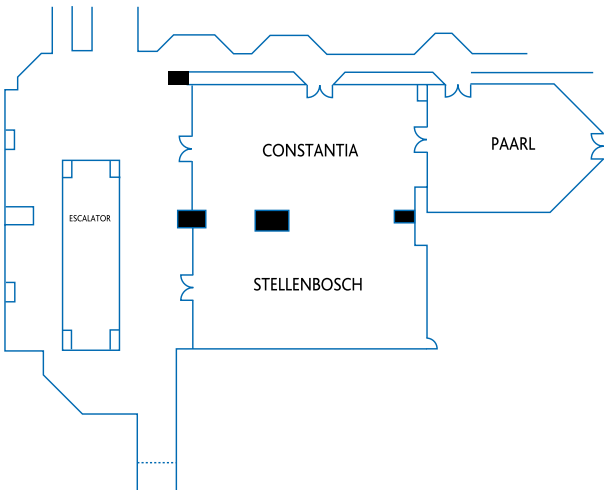
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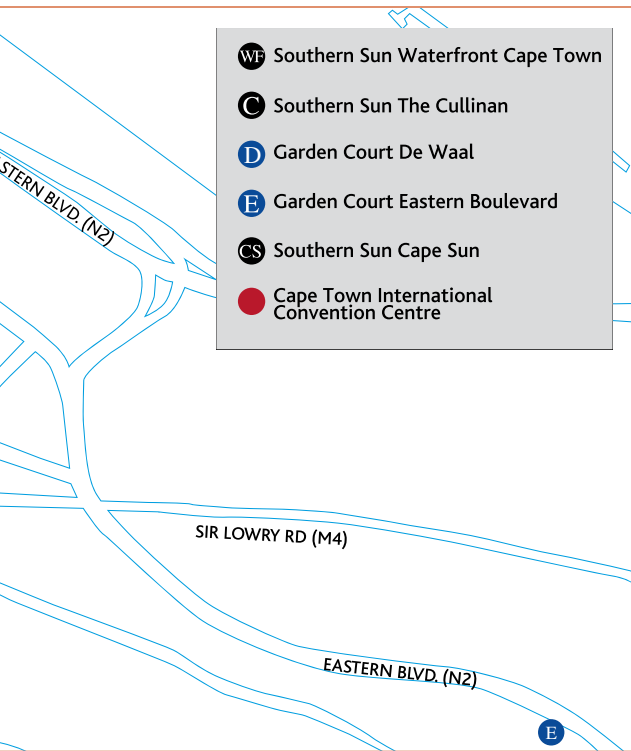
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