

# ICEAA '03

International Conference  
on Electromagnetics  
in Advanced Applications

September 8-12, 2003  
Torino, Italy



# ICEAA '03

*Organized by*

POLITECNICO DI TORINO

IEIIT-CNR

COREP

*In cooperation with*

URSI, the International Union of Radio Science

IEEE Antennas and Propagation Society

IEEE Electromagnetic Compatibility Society

IEEE Electron Devices Society

IEEE North Italy Section

IEEE North Italy Joint Chapter AP, ED, MTT

*Under the auspices of and supported by*

Città di Torino

*Sponsored by*

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

Administrative support services  
provided by COREP

**FINAL PROGRAM**

## ICEAA STEERING COMMITTEE

**Rodolfo S. Zich,** President of the Istituto Superiore  
Mario Boella  
President of the Torino Wireless  
Foundation

**Marco Ajmone Marsan,** Director of IEIIT-CNR  
**Roberto D. Graglia,** Politecnico di Torino  
**Piergiorgio L.E. Uslenghi,** University of Illinois at Chicago,  
USA

## ICEAA ORGANIZING COMMITTEE

*Chairman:*

**Roberto D. Graglia,** Politecnico di Torino

*Members:*

**Guido Lombardi,** Politecnico di Torino  
**Patrizia Savi,** Politecnico di Torino

*Secretariat:*

**Nadia Chiccoli,** Politecnico di Torino

*Engineer:*

**Augusto Olivieri,** IEIIT-CNR

*Treasurer/administration:*

**COREP,** Politecnico di Torino

## ICEAA SCIENTIFIC COMMITTEE

**P. L. E. Uslenghi,** USA, **Chair**  
**S. Benedetto,** Italy  
**O. Biro,** Austria  
**W. C. Chew,** USA  
**M. D'Amore,** Italy  
**L. B. Felsen,** USA  
**I. V. Lindell,** Finland  
**J.R. Mosig,** Switzerland  
**F. Olyslager,** Belgium  
**M. Orefice,** Italy  
**A. G. Roederer,** The Netherlands  
**W. Wiesbeck,** Germany  
**D. R. Wilton,** USA

# WELCOME TO THE CONFERENCE

On behalf of the Organizing Committee and of the Scientific Committee, I am glad to welcome all participants to the eight edition of ICEAA.

As in previous editions, the Conference has a wide scope, which includes all kinds of Advanced Applications in Electromagnetics. Broad areas are therefore covered, ranging from Electromagnetic Compatibility and Intentional Electromagnetic Interference to Antennas, from Wireless Communications to Computational Electromagnetics. In this edition ICEAA features 24 sessions including eleven special sessions and the plenary session on Multi-input multi-output and UWB systems. More than 190 papers are scheduled, out of about the 370 submitted. As in previous editions invited papers will be presented, giving recent information on the state of the art and new technologies. A half-day short course on Theory and Applications of PBG Structures will also be held on Friday morning, following all the sessions, with renowned experts serving as instructors.

The Conference is organized by the National Research Council of Italy, COREP, and by the Politecnico di Torino, a State University that is one of the major technical universities in Italy. Founded in 1859, the Politecnico currently numbers about 16000 students in Engineering, with about one third following curricula in Information Engineering.

The Conference is held at the “Torino Incontra” Congress Center. This fully air-conditioned Congress Center is in Torino downtown, near important historical monuments, museums and parks. Don't miss the opportunity to visit so many interesting places in Torino and its surroundings: I am sure you will enjoy them.

We look forward to seeing you in Torino in September.

*Roberto D. Graglia*  
Chairman of the Organizing Committee

# **GENERAL INFORMATION**

## **DATES AND LOCATION**

The conference will be held from 8th to 12th of September 2003, at the “Torino Incontra” Congress Center, Via Nino Costa 8, Torino (see map).

## **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 registration fee is 560, 00 Euro 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, banquet, and participants’ briefcase containing the Conference Proceedings and other material.

## **REGISTRATION AT THE CONFERENCE**

A registration desk will be located in the Hall of the Congress Center. Accompanying persons and late registrants may register, or pre-registrants may pick up conference materials, at the following times: Monday: 8:00÷17:00, Tuesday through Thursday: 8:30÷17:00. The accompanying person fee is 80, 00 Euro and includes only the banquet.

## **MEALS AND REFRESHMENTS**

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

## **BANQUET**

A banquet will be offered to the participants on **Wednesday night, at 20:00**, at **Palazzo BAROLO, Via Delle Orfane n. 7, Torino**.

## **PARKING**

Unguarded parking facilities are available around the Congress Center area. However, to park in the center of Torino, one has usually to buy a parking ticket at the vending machines located close to the parking area. In this part of town it is very difficult to find parking.

## **AUDIOVISUAL EQUIPMENT**

Each meeting room will be equipped with an overhead projector and a notebook. Other equipment will be available only upon written request to the Organizing Committee, to be received before September 3.

## **INTERNET CONNECTION**

Three Internet connections will be provided at the Conference Center.

## **MESSAGES**

During the Conference, messages may be directed to participants via Email ([info@iceaa.polito.it](mailto:info@iceaa.polito.it)) or by calling the Congress Center at +39-011-557-6846, or COREP at +39-011-564-5103. Messages will be posted in the main hall of the Congress Center.

## **TRANSPORTATION**

Torino International Airport is located about 15 km from the center of the city, and may be reached by bus or taxi. It is conveniently connected to the main European airports (Amsterdam, Brussels, Frankfurt, London, Paris, Rome, Zurich and many others), through which intercontinental connections are available. Alternatively, the intercontinental airport of Milano-Malpensa (120 km from Torino) or the international airport of Milano-Linate (150 km from Torino) may be used. The "Torino Incontra" Congress Center is in the center of the city and is served by several buses and tramways from other parts of town. Tickets cannot be bought on the bus or tram; they must be purchased in advance, at newsstands, bars, tobacco shops, etc.

## **WEATHER**

In mid-September, the weather in northwestern Italy is usually fair, with temperatures ranging between 15°C to 25°C. Occasional showers are possible; therefore raincoats or umbrellas may be useful.

## **HOTEL ACCOMMODATIONS**

A number of hotel rooms in different price categories have been booked for the period September 7 to 14: to make reservations, please use the form available on [www.iceaa.polito.it](http://www.iceaa.polito.it), and send it as soon as possible to:

### **ACTA**

Via Caboto 44,  
10129 Torino, Italy

**Tel. +39-011-59.18.71 - Fax +39-011-59.08.33**

**e-mail: [acta@actacongress.com](mailto:acta@actacongress.com)**

**Web site: [www.actacongress.com](http://www.actacongress.com)**

It is advisable to make an early reservation because hotels are generally full. A credit card number must guarantee reservations.

## **ACCOMPANYING PERSON PROGRAMME**

For the latest information on the Accompanying Person Programme and other Social Events please check [www.iceaa.polito.it](http://www.iceaa.polito.it), or refer to the Conference registration desk.

## **OTHER ACTIVITIES**

In September there are a number of interesting events in Torino, such as the music festival "Settembre Musica", art exhibitions, etc. Detailed information will be available at the Conference registration desk.

## **USEFUL ADDRESSES**

*For technical and scientific aspects:*

### **ICEAA Secretariat**

Dipartimento di Elettronica, Politecnico di Torino

Corso Duca degli Abruzzi 24, 10129 Torino

Tel. +39-011-564-4000

(-4056, Prof. R.D. Graglia; -4012, Mr. G. Lombardi)

Fax +39-011-564-4015/-4099

E-mail: [info@iceaa.polito.it](mailto:info@iceaa.polito.it)



*For logistics aspects:*

**COREP** (Mrs. Giusy Spinasanta)  
Tel. +39-011-564-5103  
Fax: +39-011-564-5199  
E-mail: [gspinasanta@corep.it](mailto:gspinasanta@corep.it)

*For hotel reservations:*

**ACTA**  
Via Caboto 44,  
10129 Torino, Italy  
**tel. +39.011.59.18.71, fax +39.011.59.08.33**  
**e-mail: [acta@actacongress.com](mailto:acta@actacongress.com)**  
**Web site: [www.actacongress.com](http://www.actacongress.com)**

## **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:

**COREP** (Mrs. Giusy Spinasanta)  
Tel. +39-011-564-5103, Fax: +39-011-564-5199

### **Short Course on THEORY AND APPLICATIONS OF PBG STRUCTURES USED AS ARTIFICIAL MAGNETIC CONDUCTORS AND SOFT AND HARD SURFACES**

Prof. Per-Simon Kildal of the Chalmers University of Technology, Gothenburg, Sweden, and Prof. Stefano Maci of the University of Siena, Italy, will hold a half-day short course on Theory and Applications of PBG Structures used as Artificial Magnetic Conductors and Soft and Hard Surfaces, on Friday, September 12. Participants may register for this short course at the conference registration desk. The cost of the short course is 60, 00 Euro (VAT included).

# CONFERENCE SCHEDULE

(Please check the detailed program in the following pages)

<b>MONDAY, SEPTEMBER 8</b>		
<b>SALA GIOLITTI</b>	<b>SALA EINAUDI</b>	<b>SALA SELLA</b>
	<b>Formal Opening</b> <i>9:00 ÷ 9:45</i>	
	<b>Session 1</b> Microwave and mm-wave Antennas – I  Chairs: M. Sabbadini, G. Vecchi  <i>10:20 ÷ 12:20</i>	<b>Session 2</b> EM Theory  Chairs: K.F. Casey, P.D. Smith  <i>10:40 ÷ 12:20</i>
Coffee break <i>9:45 ÷ 10:20</i> Lunch break <i>12:20 ÷ 14:00</i> Coffee break <i>16:00 ÷ 16:20</i>		
<b>Session 3</b>  Wireless Communications  Chairs: D. Erricolo, J. Kunisch  <i>14:00 ÷ 17:40</i>	<b>Session 4</b> <b>Organized by</b> <b>R.D. Graglia and</b> <b>D.R. Wilton</b>  Computational Methods in Electromagnetics  Chairs: R.D. Graglia, D.R. Wilton  <i>14:00 ÷ 18:20</i>	<b>Session 5</b>  EM Modelling of Devices and Circuits  Chairs: N.J. Champagne, Z. Raida  <i>14:00 ÷ 17:40</i>

## TUESDAY, SEPTEMBER 9

SALA GIOLITTI	SALA EINAUDI	SALA SELLA
<p><b>Session 6</b></p> <p>Materials and Measurements</p> <p>Chairs: N. Engheta, F. Olyslager</p> <p>9:00 ÷ 12:00</p>	<p><b>Session 7</b></p> <p>Microwave and mm-wave Antennas – II</p> <p>Chairs: M. Orefice, W. Wiesbeck</p> <p>9:00 ÷ 12:20</p>	<p><b>Session 8</b></p> <p>EMC-EMI-EMP - I</p> <p>Chairs: M. D'Amore, F. Krug</p> <p>9:10 ÷ 12:00</p>
<p>Coffee break 10:20 ÷ 10:40</p> <p>Lunch break 12:20 ÷ 14:00</p> <p>Coffee break 16:00 ÷ 16:20</p>		
<p><b>Plenary Session 9</b></p> <p><b>Organized by S. Benedetto</b></p> <p>Multi-input multi-output (MIMO) and ultra-wide band (UWB) systems: channel characterization for system analysis and design</p> <p>Chair: S. Benedetto</p> <p>14:00 ÷ 16:00</p>		
<p><b>Session 10</b></p> <p>EMC-EMI-EMP - II</p> <p>Chairs: C.E. Baum, R.E. Zich</p> <p>16:20 ÷ 18:20</p>	<p><b>Session 11</b></p> <p><b>Organized by J. L. Volakis</b></p> <p>Conformal and large finite array analysis techniques</p> <p>Chair: J.L. Volakis,</p> <p>16:20 ÷ 19:00</p>	<p><b>Session 12</b></p> <p><b>Organized by S. Cortiglioni, R. Tascone</b></p> <p>Electromagnetic Applications in Astrophysics</p> <p>Chairs: S. Cortiglioni, R. Tascone</p> <p>16:20 ÷ 18:40</p>

## WEDNESDAY, SEPTEMBER 10

SALA GIOLITTI	SALA EINAUDI	SALA SELLA
<p><i>Session 13</i></p> <p><b>Organized by C. E. Baum</b></p> <p>Intentional EMI</p> <p>Chair: C.E. Baum,</p> <p><i>8:40 ÷ 12:00</i></p>	<p><i>Session 14</i></p> <p><b>Organized by N. Engheta, R.W. Ziolkowski</b></p> <p>Metamaterials: Double-Negative Structures</p> <p>Chairs: N. Engheta, R.W. Ziolkowski</p> <p><i>8:20 ÷ 12:20</i></p>	<p><i>Session 15</i></p> <p>Integral Equations Methods</p> <p>Chairs: G. Manara, D.R. Wilton</p> <p><i>8:40 ÷ 12:00</i></p>
<p>Coffee break <i>10:20 ÷ 10:40</i></p> <p>Lunch break <i>12:20 ÷ 14:00</i></p> <p>Coffee break <i>16:00 ÷ 16:20</i></p>		
<p><i>Session 16</i></p> <p><b>Organized by L.B. Felsen, V. Galdi</b></p> <p>Parameterizing Wave Complexity: Problem-Matched Multiscale Representations</p> <p>Chairs: L.B. Felsen, V. Galdi</p> <p><i>14:00 ÷ 18:20</i></p>	<p><i>Session 17</i></p> <p>Arrays</p> <p>Chairs: O. M. Bucci, B. A. Munk</p> <p><i>14:00 ÷ 17:40</i></p>	<p><i>Session 18</i></p> <p><b>Organized by D. J. Serafin</b></p> <p>High power electromagnetic threats and consequences</p> <p>Chair: D.J. Serafin,</p> <p><i>14:00 ÷ 16:00</i></p>
<p><b>Banquet (20:00)</b></p>		

## THURSDAY, SEPTEMBER 11

SALA GIOLITTI	SALA EINAUDI	SALA SELLA
<p style="text-align: center;"><i>Session 19</i></p> <p style="text-align: center;"><b>Organized by R. Mittra and G. Vecchi</b></p> <p>Innovative approaches to the Solution of Large Problems in Computational Electromagnetics</p> <p style="text-align: center;">Chairs: R. Mittra, G. Vecchi</p> <p style="text-align: center;"><i>8:15 ÷ 12:20</i></p>	<p style="text-align: center;"><i>Session 20</i></p> <p style="text-align: center;"><b>Organized by R.W. Ziolkowski, N. Engheta</b></p> <p style="text-align: center;">Metamaterials: EBG Structures</p> <p style="text-align: center;">Chairs: N. Engheta, R.W. Ziolkowski</p> <p style="text-align: center;"><i>8:40 ÷ 12:20</i></p>	<p style="text-align: center;"><i>Session 21</i></p> <p style="text-align: center;">Inverse Scattering and Remote Sensing</p> <p style="text-align: center;">Chairs: S. Caorsi, G. Franceschetti</p> <p style="text-align: center;"><i>8:40 ÷ 12:20</i></p>
<p>Coffee break <i>10:20 ÷ 10:40</i> Lunch break <i>12:20 ÷ 14:00</i> Coffee break <i>16:00 ÷ 16:20</i></p>		
<p style="text-align: center;"><i>Session 22</i></p> <p style="text-align: center;">RCS and Asymptotic Techniques</p> <p style="text-align: center;">Chairs: R. Tiberio, P.L.E. Uslenghi</p> <p style="text-align: center;"><i>14:00 ÷ 17:20</i></p>	<p style="text-align: center;"><i>Session 23</i></p> <p style="text-align: center;"><b>Organized by W. Wiesbeck</b></p> <p style="text-align: center;">Special Session on RF Aspects of MIMO and Smart Antennas</p> <p style="text-align: center;">Chair: W. Wiesbeck</p> <p style="text-align: center;"><i>14:00 ÷ 17:20</i></p>	<p style="text-align: center;"><i>Session 24</i></p> <p style="text-align: center;"><b>Organized by W. R. Stone</b></p> <p style="text-align: center;">Electrical Engineering Education: Mechanisms and Motivation</p> <p style="text-align: center;">Chair: W.R. Stone</p> <p style="text-align: center;"><i>14:20 ÷ 17:00</i></p>

## FRIDAY, SEPTEMBER 12

### SALA SELLA

**P.-S. Kildal and S. Maci**  
Short Course on  
**Theory and Applications of  
PBG Structures**  
*8:30 ÷ 12:30*

# DETAILED PROGRAM

Monday, September 08, 2003, Sala Einaudi

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## Session 1

### MICROWAVE AND MM-WAVE ANTENNAS- I

Chairs: M. Sabbadini, G. Vecchi

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10:20 AM

*M. Sabbadini - European Space Agency, Noordwijk,  
The Netherlands*

#### **APPLICATIONS OF MULTI-RESOLUTION ANALYSIS TO ANTENNA DESIGN**

10:40 AM

*Z. Lukes, Z. Raida - Brno University of Technology, Brno,  
Czech Republic*

#### **DESIGN OF MICROWAVE ANTENNAS: NEURAL NETWORK APPROACH TO TIME-DOMAIN MODELING OF V-DIPOLE**

11:00 AM

*F. Vipiana - Politecnico di Torino, Torino, Italy  
M. Sabbadini - European Space Agency ESTEC, Noordwijk,  
The Netherlands*

#### **G. Vecchi - Politecnico di Torino, Torino, Italy WAVELET EXPANSION OF THE FAR FIELD FOR ANTENNA BEAM SHAPING**

11:20 AM

*E. Ávila-Navarro - Universidad Miguel Hernández, Elche, Spain  
C. Reig - Universitat de València, Burjassot, Spain*

#### **BOW-TIE ANTENNA: OPTIMAL POINT FOR COAXIAL FEEDING**

11:40 AM

*W. Kolosowski, M. Wnuk, A. Jeziorski, G. Rózanski - Military  
University, Warsaw, Poland*

#### **CIRCULAR ANTENNA WITH V-SHAPE RADIATION PATTERN IN E PLANE**

12:00 PM

*M.R. Chaharmir, J. Shaker, M. Cuhaci - Communication  
Research Centre Canada, Ottawa, Ontario  
A. Sebak - Concordia University Montreal, Quebec, Canada*  
**APPLICATION OF WAVEGUIDE TECHNOLOGY FOR  
CALCULATING THE PROFILE OF PHOTOINDUCED  
PLASMA**

**Monday, September 08, 2003, Sala Sella**

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**Session 2**

**EM THEORY**

Chairs: K.F. Casey, P.D. Smith

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10:40 AM

*J.M. Arnold and R.W. Waterton - University of Glasgow,  
Glasgow, UK*

**LAGRANGIAN PERTURBATION THEORY FOR  
POLARISED SOLITONS OF THE VECTOR  
MAXWELL-BLOCH SYSTEM**

11:00 AM

*K.F. Casey - SRI International, Menlo Park, USA*

**MODAL PROPAGATION IN A CIRCULAR TUNNEL  
WITH A ROUGH WALL: SURFACE-IMPEDANCE  
FORMULATION**

11:20 AM

*F. Zirilli - Università di Roma "La Sapienza", Roma, Italy*

**FURTIVITY AND MASKING PROBLEMS IN  
ELECTROMAGNETIC OBSTACLE SCATTERING AS  
OPTIMAL CONTROL PROBLEMS**

11:40 AM

*P.D. Smith, S.S. Vinogradov, E.D. Vinogradova - Dundee  
Univ. Dundee, Scotland UK*

*I. Kohlberg - Kohlberg Associates Inc. Alexandria, Virginia, USA*  
**ACCURATE AND EFFICIENT METHODS FOR THE  
TREATMENT OF SHIELDED MICROSTRIP LINES**

12:00 PM

*V. Metlushko, U. Welp, et al.*

*University of Illinois at Chicago, Chicago, USA*

*Argonne National Laboratory, Argonne, USA*

*Cornell University, Ithaca, USA*

*Katholieke Universiteit Leuven, Leuven, Belgium*

*Inter-University Micro-Electronics Center (IMEC), Belgium*

*McGill University, Montreal, Canada*

*University of Notre Dame, Notre Dame, USA*

**NANOMAGNETS: FROM NANO-DOTS TO NANO-RINGS**

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**Monday, September 08, 2003, Sala Giolitti**

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**Session 3**

**WIRELESS COMMUNICATIONS**

Chairs: D. Erricolo, J. Kunisch

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2:00 PM

*V. Degli Esposti, F. Fuschini, D. Guiducci - Università di  
Bologna, Pontecchio Marconi (BO), Italy*

**A STUDY ON ROOF-TO-STREET PROPAGATION**

2:20 PM

*Ph. De Doncker, J.M. Dricot, R. Meyes - Université Libre de  
Bruxelles, Brussels, Belgium*

*M. Helier, W. Tabbara - Supelec/DRE, Gif-sur-Yvette, France*

**KRIGING THE FIELDS: A NEW STATISTICAL TOOL FOR WAVE PROPAGATION ANALYSIS**

2:40 PM

*J. Latess, Stoudt - Office for Special Technology Countermeasures, Dahlgren, USA*

*K. Bowers - Booz Allen Hamilton, Contractor; Falls Church, USA*

**IMPACT OF BUILDING CONSTRUCTION ON THE PROPAGATION OF ELECTROMAGNETIC ENERGY**

3:00 PM

*E. Plouhinec - LESTP/IETR, Centre de Recherche des Ecoles de Coetquidan, Guer, France*

*B. Uguen, F. Tchoffo-Talom - IETR, INSA de Rennes, Rennes, France*

**A PARAMETRIC STUDY OF G0 TRANSMISSION APPLIED TO AN ULTRA WIDE BAND SIGNAL**

3:20 PM

*A. Bijamov, A. Razmadze, L. Shoshiashvili, K. Tavzarashvili, R. Zaridze - Tbilisi State University, Tbilisi, Georgia*

*G. Bit-Babik, A. Faraone - Motorola Corporate EME Research Laboratory, Fort Lauderdale, USA*

**ADVANCED ELECTRO-THERMAL ANALYSIS FOR THE ASSESSMENT OF HUMAN EXPOSURE IN THE NEAR-FIELD OF EM SOURCES**

3:40 PM

*R. Gardelli, G. La Cono, M. Albani - Università di Messina, Messina, Italy*

**HIGH-GAIN LOW-COST ANTENNA SYSTEMS FOR WLAN AND HYPERLAN POINT TO POINT LINKS**

4:20 PM

*L. Valbonesi, R.E. Zich - Politecnico di Milano, Milano Italy*

**SENSIBILITY OF RAY TRACING METHODS TO ENVIRONMENT DESCRIPTION IN DIFFERENT URBAN SCENARIOS**

4:40 PM

*J. Morrissey - Motorola Labs., Ft. Lauderdale, USA*

**COMPATIBLE DEPLOYMENT, USE, AND MANAGEMENT OF MOBILE PHONES AND OTHER PORTABLE WIRELESS COMMUNICATION EQUIPMENT IN HOSPITALS**

5:00 PM

*P. Ciaï, R. Staraj, G. Kossiavas, C. Luxey - Université de Nice-Sophia Antipolis, Valbonne, France*

**A MINIATURE QUADBAND ANTENNA FOR MOBILE COMMUNICATIONS**

5:20 PM

*F. Bormida, P. Savi, F. Dovis, M. Mondin - Politecnico di Torino, Torino, Italy*

**CHARACTERIZATION AND MODELING OF INDOOR MULTIPATH CHANNEL AT 2.4 GHZ**



Session 4

**SPECIAL SESSION ON COMPUTATIONAL  
METHODS IN EM**

**organized by R.D. Graglia, D.R. Wilton**

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

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2:00 PM

*M. Khayat and D.R. Wilton - University of Houston, Houston, USA*

**REVISITING THE EVALUATION OF POTENTIAL  
INTEGRALS**

2:20 PM

*R.D. Graglia and G. Lombardi - Politecnico di Torino, Torino, Italy*

**NEW HIGHER ORDER TWO-DIMENSIONAL  
SINGULAR ELEMENTS FOR FEM AND MOM  
APPLICATIONS**

2:40 PM

*G. Lombardi - Politecnico di Torino, Torino, Italy*

**IMPLEMENTATION OF HIGHER-ORDER  
TWO-DIMENSIONAL SINGULAR ELEMENTS IN  
FEM CODES AND NUMERICAL RESULTS**

3:00 PM

*R.J. Adams - University of Kentucky, Lexington, USA*

*N.J. Champagne - Lawrence Livermore National Laboratory, Livermore, USA*

*B.A. Davis - Nanosonic, Inc., Blacksburg, USA*

**FRESNEL INTEGRAL EQUATIONS: NUMERICAL  
IMPLEMENTATION**

3:20 PM

*M. Bluck, S.P. Walker - Imperial College, London, UK*

**HOMOLOGY, COHOMOLOGY AND THE  
CONSTRUCTION OF DISCRETE FUNCTION SPACES  
FOR FINITE AND BOUNDARY ELEMENT METHODS**

3:40 PM

*N.J. Champagne, J.D. Rockway - Lawrence Livermore National Laboratory, Livermore, USA*

*V. Jandhyala - University of Washington, Seattle, USA*

**COUPLED ELECTROMAGNETIC-CIRCUIT  
SIMULATIONS USING HIGHER-ORDER ELEMENTS  
AND BASES**

4:20 PM

*W.A. Johnson, L.K. Warne, R.E. Jorgenson, J.D. Kotulski,*

*G.H. Hudson and S.L. Stronach - Sandia National*

*Laboratories, Department of Electromagnetics and Plasma Physics, Albuquerque, USA*

**MODELING OF COUPLING INTO CAVITIES THROUGH  
THIN SLOTS WITH THE EIGER CODE**

4:40 PM

*M. Vouvakis, S. Lee, K. Zhao, J.-F. Lee - The Ohio State University, Columbus, USA*

**A SYMMETRIC FEM-IE FORMULATION WITH A SINGLE-LEVEL IE-QR ALGORITHM**

5:00 PM

*O. Franek, Z. Raida - Brno University of Technology, Brno, Czech Republic*

*V. Navratil, M. Leone - Siemens, Erlangen, Germany*

**ANALYSIS OF GIGAHERTZ TEM CELL USING CONTOUR-PATH AND NONORTHOGONAL FDTD METHODS**

5:20 PM

*A. Toscano and L. Vegni - Università di "Roma Tre", Rome, Italy*

**ANALYSIS OF NONLINEAR SUPERCONDUCTING MICROSTRIP LINES WITH THE AID OF THE FINITE ELEMENT METHOD**

5:40 PM

*E. Afjei, H. Arbab - Shahid Beheshti University, Tehran, Iran*

**INADEQUACIES IN FINITE DIFFERENCE SOLUTION OF LINEAR AND NON-LINEAR MAGNETOSTATIC PROBLEMS WHEN BOUNDARY CONDITION OF THE THIRD KIND IS USED**

6:00 PM

*R. Schuhmann, F. Mayer, T. Weiland - Technische Universität Darmstadt, Darmstadt, Germany*

**CONSISTENT 3D-FDTD SUBGRIDS FOR MICROWAVE APPLICATIONS**

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**Monday, September 08, 2003, Sala Sella**

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**Session 5**

**ELECTROMAGNETIC MODELING OF DEVICES AND CIRCUITS**

Chairs: N.J. Champagne, Z. Raida

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2:00 PM

*V. Otevreil, Z. Raida - Brno University of Technology, Brno, Czech Republic*

**WIDE BAND GLOBAL OPTIMIZATION OF MICROSTRIP LINE USING POLYTOPE ALGORITHMS AND REAL GENETIC ALGORITHMS**

2:20 PM

*F. Bilotti, A. Alù, and L. Vegni - University of Roma Tre, Rome, Italy*

**NEW ACCURATE FORMULA FOR THE CHARACTERISTIC IMPEDANCE OF A MICROSTRIP LINE WITH A DIELECTRIC OVERLAY**

2:40 PM

*S. Kapora, A.P.J. van Deursen - University of Technology, Eindhoven, The Netherlands*

**CHARACTERISTIC IMPEDANCE AND CROSSTALK  
OF SHIELDED TRACKS ON A PCB**

3:00 PM

*A. Abramowicz, J. Krupka, K. Derzakowski - Warsaw  
University of Technology, Warsaw, Poland*

**TRIPLET DIELECTRIC RESONATOR FILTERS WITH  
DIRECT COUPLING**

3:20 PM

*M. Motl, Z. Raida - Brno University of Technology, Brno,  
Czechia*

**TIME-DOMAIN PARAMETERS OF MICROWAVE  
TRANSMISSION LINES**

3:40 PM

*Y. Kokubo, T. Kawai and I. Ohta - Himeji Institute of  
Technology, Hyogo, Japan*

**A NEW TYPE OF PHOTONIC CRYSTAL WAVEGUIDE  
AT MILLIMETER WAVE**

4:20 PM

*Z. Raida - Brno University of Technology, Brno, Czech  
Republic*

**BROADBAND DESIGN OF PLANAR TRANSMISSION  
LINES: FEED-FORWARD NEURAL APPROACH  
VERSUS RECURRENT ONE**

4:40 PM

*M. Baralis, O.A. Peverini, G. Virone, R. Tascone and R. Orta  
- IEIIT-CNR, Politecnico di Torino, Torino, Italy*

**COUPLED-INTEGRAL-EQUATIONS AND  
DE-EMBEDDING TECHNIQUES FOR THE ANALYSIS  
OF VARIABLE CROSS-SECTION WAVEGUIDE  
COMPONENTS**

5:00 PM

*G. Virone, R. Tascone, M. Baralis, O.A. Peverini and  
G. Gentili - IEIIT (CNR), Politecnico di Torino, Torino, Italy*

**MACHINE-ORIENTED BROAD BAND MATCHED  
BENDS IN RECTANGULAR WAVEGUIDE**

5:20 PM

*W. Arter, J.W. Eastwood and N.J. Brealey - Culham Science  
Centre, Abingdon, England*

**DEVICE MODELLING USING THE EMX SOFTWARE**

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**Tuesday, September 09, 2003 - Sala Giolitti**

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**Session 6**

**MATERIAL AND MEASUREMENTS**

Chairs: N. Engheta, F. Olyslager

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9:00 AM

*A. Bedini, E. D'Emilia, C. Giliberti, M. Borra, M. Mariani,  
R. Palomba, and L. Giuliani - Istituto Superiore per la  
Prevenzione E Sicurezza sul Lavoro, Roma, Italy*

**DESIGN OF A MICROWAVE EXPOSURE SYSTEM**

9:20 AM

*M. Feo, S. Luce - MBDA Italia S.p.A., Bacoli, Napoli, Italy*  
**MILLIMETER-WAVE RADOMES MATERIALS  
CHARACTERIZATION**

9:40 AM

*A. Franchois, S. Van Damme and F. Bogman - INTEC, Ghent University, Ghent, Belgium*  
**NON-DESTRUCTIVE EVALUATION OF THE STEEL  
FIBER DENSITY IN FIBER REINFORCED CONCRETE  
WITH AN OPEN-ENDED COAXIAL SENSOR**

10:00 AM

*A. Saroglia, M. D'Urso - Alenia Aeronautica S.p.a., Caselle Torinese, Italy*  
*I. Bertino - Alenia Aeronautica S.p.a., Torino, Italy*  
**SHIELDED CLOSED HIRF/EMC FACILITY AT  
ALENIA AERONAUTICA**

10:40 AM

*T. Protasevich, V.I. Shishkovsky - Tomsk Politechnical University, Tomsk, Russia*  
**PREPARATION OF ULTRAFINE POWDERS IN HIGH-  
FREQUENCY (HF) DISCHARGES**

11:00 AM

*M. Audone - Sydera S.r.l., Torino, Italy*  
*S. Monte - Centro Ricerche Fiat, Orbassano (TO), Italy*  
**THE QUANTITATIVE EVALUATION OF THE  
IMMUNITY LEVELS OF DEVICES AND SYSTEMS**

11:20 AM

*V. Dehghanian - Tarbiat Modarres University, Tehran, Iran*  
*M. Okhovvat - Imam Hossein, University, Tehran, Iran*  
*M. Hakkak - Iran Telecommunication Research Center (ITRC), Tehran, Iran*  
**A NOVEL FAST FRAGMENTAL ALGORITHM FOR  
RECONSTRUCTING 2-D UNIFORM SAMPLES FROM  
2-D BIPOLAR ONES FOR TIME-DOMAIN PLANAR  
NEAR-FIELD ANTENNA MEASUREMENTS**

11:40 AM

*R. Saraei, J.R. Mohassel - Tehran University, Tehran, Iran*  
**ANALYSIS OF QUASI-STATIC FIELDS IN UNIAXIAL  
CHIRAL OMEGA MEDIA**

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**Tuesday, September 09, 2003, Sala Einaudi**

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**Session 7**

**MICROWAVE AND MM-WAVE ANTENNAS II**

Chairs: M. Orefice, W. Wiesbeck

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9:00 AM

*O.M. Bucci - IREA, Napoli, Italy.*  
*I. Catapano - Università di Napoli Federico II, Napoli, Italy*  
*L. Crocco, T. Isernia - DAEIMI, Università di Cassino, Cassino (FR), Italy*

**VARIABLE DIELECTRIC PROFILE ANTENNAS  
SYNTHESIS VIA INVERSE SCATTERING:  
PRELIMINARY RESULTS**

9:20 AM

*R.E. Zich, M. Mussetta, M. Tovaglieri - Politecnico di Milano, Milano, Italy*

*P. Pirinoli, M. Orefice - Politecnico di Torino, Torino, Italy*

**DESIGN AND EXPERIMENTAL VALIDATION OF A  
MICROSTRIP REFLECTARRAY**

9:40 AM

*K. Schuler, Y. Venot, W. Wiesbeck - Universität Karlsruhe, Karlsruhe, Germany*

**PLANAR MILLIMETRE WAVE ANTENNA FOR LTCC  
MULTILAYER SUBSTRATE INTEGRATION IN  
RADAR AND COMMUNICATION**

10:00 AM

*A. Alù, F. Bilotti, and L. Vegni - University of Roma Tre, Rome, Italy*

**METHOD OF LINE ALGORITHM APPLIED TO  
CONFORMAL MICROWAVE COMPONENTS WITH  
COMPLEX LOADING MEDIA**

10:40 AM

*S. Raffaelli, M.N. Johansson, and B. Johannisson - Antenna Research Center-Ericsson AB, Mölndal, Sweden.*

**CYLINDRICAL ARRAY ANTENNA DEMONSTRATOR  
FOR WCDMA APPLICATIONS**

11:00 AM

*K. Hirasawa and H. Oraizi - University of Tsukuba, Tsukuba, Ibaraki Japan*

**A REACTANCE LOADED CAVITY-BACKED  
SQUARE-LOOP SLOT ANTENNA FOR CIRCULAR  
POLARIZATION**

11:20 AM

*F. Mazlumi - Aviation Technology College, Tehran, IRAN*

*K. Barkeshli - Sharif University of Technology, Tehran, IRAN*

**A NEW DERIVATION OF THE EQUIVALENT  
PARABOLOID FOR CLASSICAL DUAL REFLECTOR  
ANTENNAS**

11:40 AM

*G. Marrocco, M. Ciattaglia - Università di Roma, Tor Vergata, Roma*

**ULTRA-WIDE BAND MODELLING OF APERTURE  
ANTENNA RADIATION:  
A NUMERICAL-ANALYTICAL APPROACH**

12:00 PM

*P. Le Thuc, R. Staraj, G. Kossiavas - Université Nice-Sophia Antipolis, Valbonne, France*

**DUAL-WIDEBAND SMALL ANTENNA**

Session 8

EMC/EMI/EMP I

Chairs: M. D'Amore, F. Krug

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9:10 AM

*M. D'Amore - Univ. of Rome "La Sapienza", Rome, Italy*  
**OVERVIEW ON IEEE TRANSACTIONS ON EMC**

9:20 AM

*M. D'Urso - Alenia Aeronautica S.p.A, Caselle Torinese (TO), Italy*  
*S. Monte - Sydera s.r.l., Torino, Italy*  
**THE DESIGN OF A FACILITY TO ACHIEVE THE HIGHEST LEVEL OF FIELD UNIFORMITY IN THE TEST VOLUME**

9:40 AM

*F. Krug, P. Russer - Universitaet Muenchen, Munich, Germany*  
**A NEW SHORT-TIME SPECTRAL ESTIMATION TECHNIQUE FOR PRECOMPLIANCE MEASUREMENTS**

10:00 AM

*L. Dosso, L. Valbonesi, R.E. Zich - Politecnico di Milano, Milano, Italy*  
**AN EFFECTIVE METHOD FOR CHARACTERIZING COMPLEX URBAN AND SUBURBAN ENVIRONMENTS AT RADIO FREQUENCY**

10:40 AM

*W. Soergel, S. Schulteis, W. Wiesbeck - University Karlsruhe, Karlsruhe, Germany*  
**TRANSIENT RADIATION OF ULTRA WIDEBAND ANTENNAS FOR RADIO LINKS**

11:00 AM

*K. Fujii, S. Harada, T. Umeda, Y. Matsumoto, A. Sugiura - Tohoku University, Sendai, Japan*  
**ESTIMATION OF THE FREE-SPACE ANTENNA FACTOR USING A NONLINEAR LEAST SQUARES METHOD**

11:20 AM

*Y.A. Kirana, A.G. Yarovoy, L.P. Ligthart - Delft University of Technology, Delft, The Netherlands*  
**OPTIMIZATION OF METAL CASE OF A GROUND PENETRATING RADAR ANTENNA**

11:40 AM

*M.S. Sarto, M. D'Amore - Univ. of Rome "La Sapienza", Rome, Italy*  
*F. Sarto - ENEA, Rome, Italy*  
*M.C. Larciprete, C. Sibiliala, M. Bertolotti - INFN Univ. of Rome "La Sapienza", Rome, Italy*  
*M. Scalora - AMSAM-RD-WS-ST, Redstone Arsenal, Alabama, USA*

**NANOLAYERED METAL-BASED FILMS FOR  
TRANSPARENT EM SHIELDS**

**Tuesday, September 09, 2003, Sala Giolitti**

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**Session 9**

**PLENARY SESSION**

**MULTI-INPUT MULTI-OUTPUT (MIMO) AND ULTRA-WIDE  
BAND (UWB) SYSTEMS: CHANNEL CHARACTERIZATION  
FOR SYSTEM ANALYSIS AND DESIGN**

**Organized by S. Benedetto**

Chair: S. Benedetto

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2:00 PM

*E. Bonek - Technische Universitaet Wien, Wien, Austria*

**SIGNAL PROCESSING AND WAVE PROPAGATION -  
AN ESSENTIAL SYMBIOSIS**

2:40 PM

*A. Burr - University of York, York U.K.*

**INFLUENCE OF RADIO PROPAGATION AND THE  
ELECTROMAGNETIC ENVIRONMENT ON THE  
CAPACITY OF MIMO SYSTEMS**

3:20 PM

*J. Kunisch, J. Pamp - IMST GmbH, Kamp-Lintfort, Germany.*

**UWB RADIO CHANNEL MODELLING  
CONSIDERATIONS**

**Tuesday, September 09, 2003, Sala Giolitti**

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**Session 10**

**EMC/EMI/EMP II**

Chairs: C.E. Baum, R.E. Zich

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4:20 PM

*A. Ageyev - Seversk State Institute of Technology, Seversk  
Tomsk Region, Russia*

*E. Alfassio Grimaldi, M. Brenna, A. Gandelli, M. Merlo, R.E.  
Zich - Politecnico di Milano, Milano, Italy*

**ANALYSIS IN A WAVELET TRANSFORMED DOMAIN  
OF THE LIGHTNING RETURN STROKE  
ELECTROMAGNETIC FIELD**

4:40 PM

*F. Duval, B. Mazari - Esigelec Irseem, Mont Saint Aignan,  
France*

**USE OF INJECTION PROBE TO SIMULATE  
CONDUCTIVE PART OF RADIATED IMMUNITY**

5:00 PM

*M.M. Danaei, J. Rashed-Mohassel, A.L. Forootan - Tehran  
University, Tehran, Iran*

**ELECTROMAGNETIC INDUCTION ON MULTI  
MICROSTRIP LINES DUE TO AN EXTERNAL EM  
FIELD AND COUPLING FROM ADJACENT LINES**

5:20 PM

*M. Vahtola, T. Tarvainen - Esju Oy, Oulu, Finland.*  
**ANALYSIS OF COUPLED SIGNAL VIAS WITH  
CIRCULARLY POSITIONED SURROUNDING  
GROUND VIAS**

5:40 PM

*T. Tarvainen - Esju Oy, Oulu, Finland*  
*R. Mäkinen - Tampere University of Technology, Tampere,  
Finland*  
*M. Vahtola - Esju Oy, Oulu, Finland*  
**APPLICATION AND MODELING OF VIA FENCES  
WITH DIFFERENT VIA DIAMETERS**

6:00 PM

*M.C. Di Piazza, G. Tinè, G. Vitale - ISSIA - CNR, Palermo,  
Italy*  
*A. Ragusa - University of Palermo, Palermo, Italy*  
**ELECTROMAGNETIC CONDUCTED EMISSIONS IN  
DUAL VOLTAGE VEHICLE ELECTRICAL SYSTEM**

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**Tuesday, September 09, 2003, Sala Einaudi**

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**Session 11**

**SPECIAL SESSION ON CONFORMAL AND  
LARGE FINITE ARRAY ANALYSIS TECHNIQUES**

**Organized by J. Volakis**

Chair: J.L. Volakis

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4:20 PM

*R. Mittra and N.-T. Huang - The Pennsylvania State  
University, University Park, USA*  
**NUMERICALLY EFFICIENT ANALYSIS OF LARGE  
ARRAY AND FSS RADOME COMPOSITES WITH  
DISSIMILAR PERIODICITIES**

4:40 PM

*R.W. Kindt - The University of Michigan, Ann Arbor, USA*  
*J.L. Volakis - The Ohio State University, Columbus, USA*  
**FINITE ARRAY ANALYSIS USING A  
MULTI-DIMENSIONAL, MULTI-CELL HYBRID ARRAY  
DECOMPOSITION-FAST MULTIPOLE METHOD**

5:00 PM

*I. Rullhusen, F. Arndt - University of Bremen, Bremen, Germany*  
**AIM ANALYSIS OF SLOT ARRAYS**

5:20 PM

*L. Kempel - Michigan State University, Michigan, USA*  
*C. Macon - High Performance Technology, Inc., Aberdeen,  
MD, USA*  
*S. Schneider - Air Force Research Laboratory, Wright-  
Patterson AFB, OH, USA*  
**COMPARISON OF PLANAR AND CONFORMAL  
ANTENNAS USING EMERGING MATERIALS**



5:40 PM

*P.H. Pathak, P. Janpugdee, P. Mahachoklertwattana - The Ohio State University, Columbus, USA*

*P. Nepa - University of Pisa, Pisa, Italy*

**A FAST ANALYSIS OF THE RADIATION AND SCATTERING FROM A LARGE MICROSTRIP ANTENNA ARRAY**

6:00 PM

*B. Munk, J. Pryor - The Ohio State University, Columbus, USA*

**HOW TO ELIMINATE JITTER IN FINITE ARRAYS**

6:20 PM

*Ö. Aydin Civi - East Technical University, Ankara, Turkey*

*V.B. Erturk - Bilkent University, Ankara, Turkey*

*H.T. Chou - Yuan Ze University, Taiwan*

**EFFICIENT ANALYSIS OF LARGE FINITE ARRAYS VIA MOM FORMULATION WITH DFT BASED ACCELERATION ALGORITHMS**

6:40 PM

*A. Cucini, S. Maci - University of Siena, Siena, Italy*

**SURFACE AND LEAKY WAVE EXCITATION IN LARGE FINITE PERIODIC MICROSTRIP ARRAYS**

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**Tuesday, September 09, 2003, Sala Sella**

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**Session 12**

**SPECIAL SESSION ON  
ELECTROMAGNETIC APPLICATIONS IN ASTROPHYSICS**

**Organized by S. Cortiglioni, R. Tascone**

Chairs: S. Cortiglioni, R. Tascone

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4:20 PM

*G. Moorey, R. Gough, R. Bolton, M. Bowen, A. Dunning and H. Kanoniuk - CSIRO Australia Telescope, Epping, Australia*

**MILLIMETRE-WAVE RECEIVER SYSTEM AND COMPONENT DESIGN FOR THE AUSTRALIA TELESCOPE**

4:40 PM

*P. Sjöman, N.J. Hughes, P. Jukkala, S. Ovaska - Helsinki University, Kylmäla, Finland*

*J. Varis, J. Tuovinen - MilliLab, VTT Information Technology, Espoo, Finland*

**PLANCK LOW FREQUENCY INSTRUMENT (LFI) 70 GHZ RECEIVERS MODULES**

5:00 PM

*E. Carretti, S. Cortiglioni, C. Macculi - Iasf/Cnr, Bologna, Italy*  
*C. Sbarra, J. Monari, A. Orfei, M. Poloni, S. Poppi - Ira/Cnr, Bologna, Italy*

*M. Baralis, O.A. Peverini, R. Tascone, G. Virone - Ieii/Cnr, Politecnico di Torino, Torino, Italy*

*M. Zannoni - Iasf/Cnr, Milano, Italy*

*G. Sironi - Università di Milano Bicocca, Milano, Italy*

**SPORT: A MICROWAVE EXPERIMENT FOR CMB**

**POLARIZED EMISSION MEASUREMENTS  
DESIGNED TO MINIMIZE INSTRUMENTAL  
POLARIZATION**

5:20 PM

*P. Bolli - Università di Firenze, Firenze, Italy*  
*E. Carretti - Consiglio Nazionale delle Ricerche, Bologna, Italy*  
*V. Natale - Consiglio Nazionale delle Ricerche, Firenze, Italy*  
*R. Nesti - Osservatorio Astrofisico di Arcetri, Firenze, Italy*

**FEED DESIGN FOR APPLICATIONS IN  
ASTROPHYSICS**

5:40 PM

*O.A. Peverini, R. Tascone, M. Baralis, G. Virone, A. Olivieri,  
R. Orta - Politecnico di Torino, Torino, Italy*

**ANTENNA FEED SYSTEM FOR CORRELATION  
POLARIMETERS**

6:00 PM

*A. Orfei, G. Zacchiroli, J. Roda, G. Maccaferri, M. Morsiani,  
F. Fiocchi - CNR, Bologna, Italy*

**NEW SOLUTIONS ON LARGE REFLECTOR ANTEN-  
NAS FOR RADIOASTRONOMICAL APPLICATIONS  
IN THE MICROWAVE AND MILLIMETER RANGE**

6:20 PM

*M. Poloni, F. Perini, S. Montebugnoli, J. Monari, S. Righini -  
\*CNR Villafontana (Bo), Italy*

**SKA: THE NEXT GENERATION RADIO TELESCOPE  
AND RELATED REQUIREMENTS OF STATE OF THE  
ART OF LOW-COST HIGH-PERFORMANCE FRONT  
END.**

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**Wednesday, September 10, 2003, Sala Giolitti**

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**Session 13**

**SPECIAL SESSION ON  
INTENTIONAL EMI**

**Organized by C. Baum**

Chair: C.E. Baum

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**Part A. Sources (Interfering Environment)**

8:40 AM

*C.E. Baum - Air Force Research Laboratory, Kirtland, USA*  
**OPTIMIZATION OF REFLECTOR IRA APERTURE  
FOR FILLING A RECTANGLE**

9:00 AM

*C.E. Baum - Air Force Research Laboratory, Kirtland, USA*  
**SOME TOPICS CONCERNING CABLE FEEDS OF  
REFLECTOR IRAS**

9:20 AM

*R. Torres, C.E. Baum, W.D. Prather, T. Tran, J.W. Burger - Air  
Force Research Laboratory, Kirtland, USA*  
**UPDATE TO RESEARCH AND DEVELOPMENT IN  
ULTRA-WIDEBAND SOURCES AND ANTENNAS**

9:40 AM

*J. Tatoian - Eureka Aerospace Corporation, Pasadena, USA*  
*D. Giri - Pro-Tech, Alamo, California, USA*  
*R. Manzano, G. Gibbs - MARCORSYSCOM, Quantico, USA*  
**FEASIBILITY OF AN IMPULSE RADIATING  
ANTENNA (IRA) FOR 'THROUGH THE WALL'  
SENSING**

10:00 AM

*G.M. Loubriel, A. Mar, R.A. Salazar, and L. Bacon - Sandia  
National Laboratories, Albuquerque, USA*  
**HIGH POWER MICROWAVE, RADIO FREQUENCY,  
AND COMPONENT DEVELOPMENT AT SANDIA  
NATIONAL LABORATORIES**

***Part B. Interaction of Fields with Complex Systems***

10:40 AM

*J. Nitsch, S. Tkachenko - University Magdeburg, Magdeburg,  
Germany*  
**THE CIRCULAR LOOP ABOVE CONDUCTING  
GROUND - A TRANSMISSION LINE DESCRIPTION**

***Part C. Effects***

11:00 AM

*P.D. Smith - Macquarie University, Sydney, Australia*  
*S.M. Booker, E.D. Vinogradova - University of Dundee,  
Dundee, Scotland UK*  
*P.V. Brennan, R. Bullock - University College London,  
London, U.K.*  
**IN-BAND DISRUPTION OF PRACTICAL NONLINEAR  
ELECTRONIC SYSTEMS VIA OPTIMAL FORCING  
FUNCTIONS**

11:20 AM

*D. Dupouy - DGA/DCE/Centre d'Etudes de Gramat, Gramat,  
France*  
**INTENTIONAL EMI APPLIED TO CIVILIAN  
AIRCRAFT INDUSTRY**

***Part D. Protection (Hardening)***

11:40 AM

*R. Boling - Institute for Defense Analyses, Alexandria, USA*  
*I. Kohlberg - Kohlberg Associates Inc., Reston, USA*  
**COUNTERACTING PULSED INTERFERENCE IN  
DATA COMMUNICATION**

Session 14

**SPECIAL SESSION ON  
METAMATERIALS: DOUBLE-NEGATIVE STRUCTURES**

**Organized by N. Engheta, R.W. Ziolkowski**

Chairs: N. Engheta, R.W. Ziolkowski

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8:20 AM

*K. Balmain, A. Luttgen, P. Kremer - University of Toronto,  
Toronto, Canada*

**USING RESONANCE CONE REFRACTION FOR  
COMPACT RF METAMATERIAL DEVICES**

8:40 AM

*G. Tayeb, S. Enoch, P. Vincent, P. Sabouroux - Faculté de  
Saint Jérôme, Marseille, France*

**A COMPACT DIRECTIVE ANTENNA USING ULTRA-  
REFRACTIVE PROPERTIES OF METAMATERIALS**

9:00 AM

*C. Caloz, T. Itoh - University of California, Los Angeles, USA*

**MICROWAVE APPLICATIONS OF NOVEL  
METAMATERIALS**

9:20 AM

*G. Kiziltas, D. Psychoudakis, J.L. Volakis, N. Kikuchi and  
J. Halloran - The University of Michigan, Ann Arbor, USA*

**MINIATURE ANTENNA DESIGNS ON  
METAMATERIAL SUBSTRATES**

9:40 AM

*A. Alù - Università di Roma Tre, Roma, Italy*

*N. Engheta - University of Pennsylvania, Philadelphia, USA*

**RESONANCES IN SUB-WAVELENGTH  
CYLINDRICAL STRUCTURES MADE OF PAIRS OF  
DOUBLE-NEGATIVE AND DOUBLE-POSITIVE OR  
EPSILON-NEGATIVE AND MU-NEGATIVE COAXIAL  
SHELLS**

10:00 AM

*R. Marqués, J.D. Baena, et al.*

*Universidad de Sevilla, Sevilla, Spain*

*Universidad Pública de Navarra, Navarra, Spain*

*Universitat Autònoma de Barcelona, Barcelona, Spain*

**NOVEL SMALL RESONANT ELECTROMAGNETIC  
PARTICLES FOR METAMATERIAL AND FILTER  
DESIGN**

10:40 AM

*S.I. Maslovski, S.A. Tretyakov, I.S. Nefedov, M.K. Kärkkäinen  
- Helsinki University of Technology, Helsinki, Finland*

**RESONATORS WITH BACKWARD-WAVE SLABS:  
EVANESCENT MODES MEMORIZED**

11:00 AM

*A.L. Topa - Technical University of Lisbon, Lisbon, Portugal*

**LEAKY MODES IN PLANAR WAVEGUIDES  
CONTAINING DNG METAMATERIALS**

11:20 AM

*S. Hrabar, J. Bartolic - University of Zagreb, Zagreb, Croatia*

**EXPERIMENTAL INVESTIGATION OF BACKWARD  
META-MATERIALS IN WAVEGUIDE ENVIRONMENT**

11:40 AM

*D. Sjoberg, G. Kristensson, and C. Engstrom - Lund*

*University, Lund, Sweden*

**VALIDITY OF HOMOGENIZATION USING BLOCH  
WAVES**

12:00 AM

*R.W. Ziolkowski and C.-Y. Cheng - University of Arizona,*

*Tucson, USA*

**TAILORING DOUBLE NEGATIVE METAMATERIAL  
RESPONSES TO ACHIEVE TRANSVACUUM  
PROPAGATION SPEEDS ALONG TRANSMISSION  
LINES**

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**Wednesday, September 10, 2003, Sala Sella**

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**Session 15**

**INTEGRAL EQUATION METHODS**

Chairs: G. Manara, D.R. Wilton

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8:40 AM

*F. Olyslager - Ghent University, Gent, Belgium*

**A NEW SERIES EXPANSION FOR THE GREEN  
DYADICS OF LAYERED MEDIA BASED ON PMLS**

9:00 AM

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

*M.D. Lockard, C.M. Butler - Clemson University, Clemson, USA*

**COMPARISON AMONG CURRENTS ON SURFACES  
INSIDE AND NEAR A SEMIELLIPITICAL CHANNEL  
FILLED WITH ISOREFRACTIVE MATERIAL THAT  
BACKS A SLOTTED PLANE: CURRENTS COMPU-  
TED BY ANALYTICAL FORMULAS AND BY INTE-  
GRAL EQUATION METHODS**

9:20 AM

*P. Cullen - Trinity College, Dublin, Ireland*

**A NOVEL ITERATIVE SOLUTION OF THE THREE-  
DIMENSIONAL ELECTRIC FIELD INTEGRAL  
EQUATION**

9:40 AM

*F. Razavi, J.R. Mohassel, R.F. Dana - Tehran University,  
Tehran, Iran*

**ANALYSIS OF CURVED MICROSTRUCTURE BENDS  
USING WAVELET-BASED METHOD OF MOMENT**

10:00 AM

*P. Anyutin, A.G. Kyurkchan, V.I. Stasevich - Russian New  
University, Moscow, Russia*

**WAVELETS TECHNIQUE AND SCATTERING  
PROBLEMS BY SCREENS**

10:40 AM

*S. Kahng - Etri, Yusong-gu, Daejeon, Korea*

*J. Choi - Hanyang Univ., Seondong-gu, Seoul, Korea*

**EFFICIENT HYBRID METHOD OF 2D PERIODIC  
GREEN'S FUNCTIONS AND DCIM FOR THE  
PERIODIC STRIPS IN LAYERED MEDIA**

11:00 AM

*J.P. Damiano, J.Y. Dauvignac - Université de Nice-Sophia  
Antipolis, Valbonne, France*

*P. Dubois, C. Dedebean, P.Y. Garel - France Telecom R&D, La  
Turbie, France*

*J.P. Zolesio - Cnrs-Inria, Valbonne, France*

**ORIGINAL AND ACCURATE POLYNOMIAL  
INTERPOLATION METHOD TO DETERMINE THE  
SURFACE CURRENTS WITH A MINIMUM OF  
KNOWN POINTS IN THE CASE OF DIFFRACTION  
AND RADIATING PROBLEMS**

11:20 AM

*N.V. Budko - Delft University of Technology, Delft, The  
Netherlands*

*A.B. Samokhin - Moscow Institute of Radio Engineering,  
Moscow, Russia*

**ON THE RELATION BETWEEN THE  
ELECTROMAGNETIC CONTRAST AND  
THE SPECTRUM OF THE VOLUME INTEGRAL  
OPERATOR**

11:40 AM

*A. Cuomo, M. Lucido, G. Panariello, F. Schettino*

**FULL-WAVE ANALYSIS OF PERFECTLY  
CONDUCTING THICK STRIPS**

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**Wednesday afternoon - Sala Giolitti**

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**Session 16**

**SPECIAL SESSION ON  
PARAMETERIZING WAVE COMPLEXITY:  
PROBLEM-MATCHED MULTISCALE  
REPRESENTATIONS**

**Organized by L.B. Felsen, V. Galdi**

Chairs: L.B. Felsen, V. Galdi

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2:00 PM

*L.B. Felsen - Boston University, Boston, USA*

**PARAMETERIZING WAVE COMPLEXITY:  
PROBLEM-MATCHED MULTISCALE  
REPRESENTATIONS**

2:40 PM

*I.M. Pinto - University of Sannio, Benevento, Italy*

**ELECTROMAGNETIC CHAOS: A TUTORIAL**

3:00 PM

*A. Mackay - Q-par Angus Ltd, Leominster, Herefordshire, UK*

**CALCULATING THE RADAR CROSS SECTION OF**

**ELECTRICALLY LARGE DUCTS USING RANDOM WAVES AND RAYS**

3:20 PM

*G. Castaldi, V. Galdi, V. Pierro, I.M. Pinto - University of Sannio, Benevento, Italy*

*V. Fiumara - University of Salerno, Fisciano, (SA), Italy*

*L.B. Felsen - Boston University, Boston, USA*

**TOWARD A FULL-WAVE-BASED ELECTROMAGNETICS APPROACH TO CHAOTIC FOOTPRINTS IN A COMPLEX DETERMINISTIC ENVIRONMENT: PRELIMINARY RESULTS**

3:40 PM

*G. Franceschetti - Università Federico II di Napoli, Napoli, Italy*

*M. Franceschetti - University of California at Berkely, Berkely, USA*

*S. Marano - Università di Salerno, Fisciano (SA), Italy*

**STOCHASTIC RAYS: PRESENTATION AND APPLICATIONS**

4:20 PM

*M. Franceschetti - University of California at Berkely, Berkely, USA*

**STOCHASTIC RAYS: THE CLUTTERED ENVIRONMENT**

4:40 PM

*S. Marano - Università di Salerno, Fisciano (SA), Italy*

**STOCHASTIC RAYS: THE PERCOLATIVE LATTICE ENVIRONMENT**

5:00 PM

*V. Lomakin - Univ. of Illinois, Urbana, USA*

*B.Z. Steinberg - E. Heyman Tel-Aviv University, Tel-Aviv, Israel*

**MULTIRESOLUTION HOMOGENIZATION AND SCATTERING FROM THE INTERFACE OF A MICRO-SCALE LAMINATE**

5:20 PM

*J.M. Arnold and J.-H. Lee - University of Glasgow, Glasgow, UK*

**HIGH-FREQUENCY AND MULTI-SCALE ASYMPTOTICS OF RAY-GENERATED FIELDS USING A WILSON BASIS IN PHASE-SPACE**

5:40 PM

**PANEL DISCUSSION**

Session 17

ARRAYS

Chairs: O.M. Bucci, B.A. Munk

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2:00 PM

*B.A. Munk, J.B. Pryor - The Ohio State University, Columbus, USA*

**BROADBAND WIRE ARRAYS**

2:40 PM

*A. Polemi, D. Nencini, S. Maci, A. Toccafondi - University of Siena, Siena, Italy*

**UNIFORM HIGH-FREQUENCY GREEN'S FUNCTION FOR A SECTORAL ARRAY OF ELECTRIC DIPOLES ON A GROUNDED DIELECTRIC SLAB**

3:00 PM

*R. Vescovo - Università di Trieste, Trieste, Italy*

**CONTROLLED REDUCTION OF THE NEAR FIELD IN PATTERN SYNTHESIS FOR ARBITRARY ARRAYS**

3:20 PM

*D.J. Bekers, S.J.L. van Eijndhoven, A.A.F. van de Ven, A.G. Tijhuis - Eindhoven University of Technology, Eindhoven, The Netherlands*

*P-P. Borsboo - Thales Nederland, The Netherlands*

**MODELING AND ANALYSIS OF FINITE PHASED ARRAYS OF MICROSTRIP ANTENNAS - AN EIGENVECTOR APPROACH**

3:40 PM

*F. Venneri, G. Di Massa, S. Costanzo - Università della Calabria, Rende (Cs), Italy*

*G. Angiulli - Università Mediterranea di Reggio Calabria, Reggio Calabria, Italy*

**EFFECTS OF THE DIFFERENT INCIDENCE ANGLE BETWEEN FEED AND ELEMENTS IN PRINTED REFLECTARRAYS DESIGN**

4:20 PM

*T. Do-Hong, B. Biscontini, P. Russer - Munich University of Technology, Munich, Germany*

*F. Demmel - Rohde & Schwarz Company, Munich, Germany*

**DIRECTION-OF-ARRIVAL ESTIMATION AND BEAMFORMING FOR WIDEBAND SMART ANTENNAS**

4:40 PM

*H. Miyashita, K. Nishizawa, S. Makino - Mitsubishi Electric Corporation, Kanagawa, Japan*

**APPLICATION OF ELECTROMAGNETICALLY COUPLED COAXIAL DIPOLE ARRAY ANTENNA FOR WIND PROFILING RADAR**

5:00 PM

*F. Venneri, S. Costanzo, G. Di Massa - Università della Calabria, Rende (CS), Italy*



*G. Angiulli - Università Mediterranea di Reggio Calabria, Italy*  
**SLOT-COUPLED MICROSTRIP REFLECTARRAY  
ANTENNAS**

5:20 PM

*L. Baggen, S. Holzwarth, O. Litschke, W. Simon - Imst GmbH,  
Kamp-Lintfort, Germany*

**CALCULATING FAR-FIELD PATTERNS OF LARGE  
ARRAYS COMPOSED OF EQUENTIALLY ROTATED  
ELEMENTS : A FIRST ANALYSIS USING FDTD**

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**Wednesday, September 10, 2003, Sala Sella**

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**Session 18**

**SPECIAL SESSION ON  
HIGH POWER ELECTROMAGNETIC THREATS  
AND CONSEQUENCES**

**Organized by D.J. Serafin**

Chair: D.J. Serafin

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2:00 PM

*D.J. Serafin and J.-C. Joly - Centre d'Etudes de Gramat,  
Gramat, France*

**HIGH POWER ELECTROMAGNETIC THREAT AND  
CONSEQUENCIES**

2:20 PM

*R.A. Perala, J.R. Elliott, S.F. Kawalko, P.H. Ng - Electro  
Magnetic Applications Inc, Lakewood, USA*

**VIRTUAL HPM SYSTEM ASSESSMENT**

2:40 PM

*K.J. Ruffing - Eme Competence Center, Greding, Germany*

**HPM/UWB THREATS ON REAL TARGETS AND  
THEIR CONSEQUENCES**

3:00 PM

*F. Sabath, M. Bäckström et al.*

*Swedish Defense Research Agency, Linkoping, Sweden  
Armed Forces Research Institute for Protection Technologies  
and NBC, Munster, Germany*

*Swedish Defense Material Administration, Linkoping, Sweden  
DGA/DCE/Centre d'Etudes de Gramat, Gramat, France*

*Qineti Q Malvern Technology Center, Great Malvern*

**OVERVIEW OF WORLDWIDE HIGH POWER  
MICROWAVE NARROW BAND FACILITIES**

3:20 PM

*F. Sonnemann, R. Stark, J. Bohl - Diehl Foundation & Co.,  
Röthenbach, Germany*

**EXPERIMENTAL AND NUMERICAL ANALYSIS ON  
PCB-COUPLING IN MISSILE LIKE CYLINDRICAL  
STRUCTURES**

3:40 PM

**PANEL DISCUSSION**

Session 19

**SPECIAL SESSION ON  
INNOVATIVE APPROACHES TO THE SOLUTION OF  
LARGE PROBLEMS IN COMPUTATIONAL  
ELECTROMAGNETICS**

**Organized by R. Mittra, G. Vecchi**

Chairs: R. Mittra, G. Vecchi

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8:15 AM

*P. Pirinoli, F. Vipiana, L. Matekovits, G. Vecchi - Politecnico di Torino, Torino, Italy*

**MULTISCALE ANALYSIS OF COMPLEX ANTENNA STRUCTURES**

8:40 AM

*B. Fassenfest - University of Houston, Houston, USA*

*F. Capolino - University of Siena, Siena, Italy*

*D.R. Wilton, D.R. Jackson - University of Houston, Houston, USA*

*N. Champagne - Lawrence Livermore Laboratory, Livermore, USA*

**GENERAL MOM SOLUTIONS FOR LARGE ARRAYS**

9:05 AM

*M. Bandinelli, E. Chiavaccini, D. Gabbani - IDS s.p.a., Pisa, Italy*

**THEORY AND APPLICATIONS OF 'ADAPTIVE MBPE' IN THE FRAME OF ANTENNA DESIGN AND EMC COMPUTATIONAL ELECTROMAGNETIC PROBLEMS**

9:30 AM

*G. Tiberi, S. Rosace, A. Monorchio and G. Manara - University of Pisa, Pisa, Italy*

**NUMERICAL SOLUTION OF ELECTROMAGNETIC SCATTERING FROM LARGE CONDUCTING BODIES BY USING ANALYTICALLY-DERIVED CHARACTERISTIC BASIS FUNCTIONS**

9:55 AM

*R. Mittra - EMC Lab, Penn State University, University Park, USA*

**A PROPOSED NEW PARADIGM FOR SOLVING SCATTERING PROBLEMS INVOLVING ELECTRICALLY LARGE OBJECTS USING THE CHARACTERISTIC BASIS FUNCTIONS METHOD.**

10:40 AM

*A.G. Tijhuis, M.C. van Beurden and E. Korkmaz - Eindhoven University of Technology, Eindhoven, the Netherlands*

**MODELING ELECTROMAGNETIC FIELDS IN LARGE, FINITE STRUCTURES USING ITERATIVE TECHNIQUES AND THE EQUIVALENCE PRINCIPLE**

11:05 AM

*D. Lukashovich, P. Russer - Technische Universitat Munchen, Munich, Germany*

*A. Cangellaris - University of Illinois, Urbana-Champaign, Urbana, U.S.A.*

**USING OF LANSCOZ AND ARNOLDI ALGORITHMS FOR TLM-ROM**

11:30 AM

*S. Knörzer, Y. Zhang, J. von Hagen, W. Wiesbeck - Universität Karlsruhe, Karlsruhe, Germany*

**MODELING AND DESIGN OF ARTIFICIAL PERFECT MAGNETIC CONDUCTORS**

11:55 AM

*M.C. van Beurden, B.P. de Hon - Eindhoven University of Technology, Eindhoven, The Netherlands*

**ELECTROMAGNETIC MODELLING OF ANTENNAS MOUNTED ON A BAND-GAP SLAB - DISCRETISATION ISSUES AND DOMAIN AND BOUNDARY INTEGRAL EQUATIONS**

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**Thursday, September 11, 2003, Sala Einaudi**

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**Session 20**

**SPECIAL SESSION ON  
METAMATERIALS: EBG STRUCTURES**

**Organized by R.W. Ziolkowski and N. Engheta**

Chairs: N. Engheta, R.W. Ziolkowski

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8:40 AM

*I. Ederra, R. Ponzalo - Universidad Pública de Navarra, Pamplona, Spain*

*C. Mann - Rutherford Appleton Laboratory, Chilton, Didcot, Oxfordshire, England*

*F. van de Water - Eindhoven University of Technology, Eindhoven, The Netherlands*

*A. Moroz, P. de Maagt - ESTEC, Noordwijk, The Netherlands*  
**(SUB)MM-WAVE COMPONENTS AND SUBSYSTEMS BASED ON PBG TECHNOLOGY**

9:00 AM

*C. Caloz, A. Sanada, T. Itoh - University of California, Los Angeles, USA*

**PERIODIC STRUCTURES WITH UNUSUAL EM PROPERTIES**

9:20 AM

*F. Capolino - University of Siena, Siena, Italy*

*D.R. Jackson, D.R. Wilton - University of Houston, Houston, USA*

**NUMERICAL EVALUATION AND FIELD REPRESENTATION IN 2D PERIODIC ARTIFICIAL MATERIALS EXCITED BY A LINE SOURCE**

9:40 AM

*S. Maci, M. Cataletti, M. Chiazzo, A. Cucini - Università di Siena, Siena, Italy*

**BAND-GAP PROPERTIES OF ARTIFICIAL SURFACES**

10:00 AM

*J. Yeo, R. Mittra and Ji-fu Ma - The Pennsylvania State University, University Park, USA*

**DESIGN OF ARTIFICIAL MAGNETIC GROUND PLANES (AMGS) UTILIZING FREQUENCY SELECTIVE SURFACES EMBEDDED IN LOSSY MULTILAYER DIELECTRIC AND MAGNETIC MATERIALS**

10:40 AM

*F. Martín, J. Bonache, I. Gil - Universitat Au tònom de Barcelona, Barcelona, Spain*

*F. Falcone, T. Lopetegi, M.A.G. Laso, M. Sorolla - Universidad Pública de Navarra, Pamplona, Spain*

**NEW CAPACITIVELY COUPLED RESONATOR BAND PASS FILTERS BASED ON ELECTROMAGNETIC BANDGAPS**

11:00 AM

*C. Vardaxoglou, A. Chauraya, A.P. Feresidis - Loughborough University, Loughborough, UK*

*P. Maagt - ESTEC, Noordwijk, The Netherlands*

**TUNABLE METALLODIELECTRIC ELECTROMAGNETIC BAND GAP (MEBG) STRUCTURES WITH DEFECTS**

11:20 AM

*A.P. Feresidis, G. Apostolopoulos, G. Goussetis, and J.C. Vardaxoglou - Loughborough University, Loughborough, UK*

**MINIATURISED METALLODIELECTRIC ELECTROMAGNETIC BAND GAP STRUCTURES**

11:40 AM

*A. Hoorfar, J. Zhu - Villanova University, Villanova, USA*

*N. Engheta - University of Pennsylvania, Philadelphia, USA*

**EVOLUTIONARY SYNTHESIS OF NON-UNIFORM PARTIALLY REFLECTIVE SURFACES FOR BEAM SHAPING OF MICROSTRIP ANTENNAS**

12:00 AM

*A.A. Oliner, D.R. Jackson - Polytechnic University, Brooklyn NY, USA*

*T. Zhao and J.T. Williams - University of Houston, Houston, USA*

**LEAKY SURFACE-PLASMON THEORY FOR DRAMATICALLY ENHANCED TRANSMISSION THROUGH A SUB-WAVELENGTH APERTURE**

Session 21

**INVERSE SCATTERING AND REMOTE SENSING**

Chairs: S. Caorsi, G. Franceschetti

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8:40 AM

*L. Crocco - CNR, Napoli, Italy*

*M. D'Urso, T. Isernia - Università di Napoli Federico II, Napoli, Italy*

**INVERSE SCATTERING FROM PHASELESS MEASUREMENTS OF THE TOTAL FIELD**

9:00 AM

*R. Persico and F. Soldovieri - CNR, Napoli, Italy*

**LINEAR INVERSE SCATTERING APPLIED TO GPR PROSPECTING: SOME EFFECTS OF THE RADIATED POWER**

9:20 AM

*N.V. Budko, R.F. Remis - Electromagnetic Research, Delft University of Technology, Delft, The Netherlands*

**A MODEL ORDER REDUCTION APPROACH TO NONLINEAR EFFECTIVE INVERSION**

9:40 AM

*V. Kovalenko, A. Yarovoy, L.P.L. Ligthart - Delft University of Technology, Delft, The Netherlands*

**APPLICATION OF DECONVOLUTION AND PATTERN SEARCH TECHNIQUES TO HIGH RESOLUTION GPR DATA**

10:00 AM

*T. Melamed - Ben-Gurion University of the Negev, Beer Sheva, Israel*

**LOCALIZED INVERSE SCATTERING**

10:40 AM

*S. Caorsi, G. Cevini - University of Pavia, Pavia, Italy*

**ASSESSMENT OF A NEURAL NETWORK APPROACH TO SOLVE TWO-DIMENSIONAL ELECTROMAGNETIC INVERSE SCATTERING PROBLEMS**

11:00 AM

*D. Smith, M. Leach - Northumbria University, Newcastle upon Tyne, UK*

**3D IMAGING OF ANTENNA FIELDS AND METAL OBJECTS USING A NEW INDIRECT HOLOGRAPHIC METHOD**

11:20 AM

*F. Mazlumi, S.H.H. Sadeghi, and R. Moini - AmirKabir University of Technology, Tehran, IRAN*

**OUTPUT SIGNAL PREDICTION OF AN OPEN-ENDED WAVEGUIDE PROBE WHEN SCANNING TILTED CRACKS IN METALS**

11:40 AM

*Y. Shlivinski, M. Zelig, A. Sananes, E. Heyman, R. Kastner, A.*

*Boag - Tel Aviv University, Tel Aviv, Israel*

**PHYSICAL MODELS FOR POLARIMETRIC SAR ANALYSIS**

12:00 AM

*H. Sahinturk - Yildiz Technical University, Istanbul, Turkey*

**RECONSTRUCTION OF BURIED OBJECTS IN A CYLINDER WITH RESISTIVE BOUNDARY**

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**Thursday, September 11, 2003, Sala Giolitti**

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**Session 22**

**RADAR CROSS SECTION AND ASYMPTOTIC TECHNIQUES**

Chairs: R. Tiberio, P.L.E. Uslenghi

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2:00 PM

*A. Toccafondi, R. Tiberio and A. Polemi - University of Siena, Siena, Italy*

**UTD AND ITD FOR PLANAR JUNCTIONS BETWEEN DIFFERENT SCREENS**

2:20 PM

*D. Erricolo and P.L.E. Uslenghi - University of Illinois at Chicago, Chicago, USA*

**EXACT SCATTERING FROM A CYLINDRICALLY-CAPPED METALLIC WEDGE EDGE-COATED WITH ANISOTROPIC MATERIAL**

2:40 PM

*R. Zetík, - Technische Universität Ilmenau, Ilmenau, Germany  
J. Sachs - MEODAT GmbH, Ilmenau, Germany*

**RADAR: DISTANCE AND POSITIONING MEASUREMENTS**

3:00 PM

*S. Selleri, G. Pelosi - University of Florence, Florence - Italy  
R.D. Graglia - Politecnico di Torino, Torino, Italy*

**THE PARABOLIC EQUATION METHOD FOR THE ELECTROMAGNETIC SCATTERING FROM A WEDGE WITH CONVEX FACES**

3:20 PM

*H.J. Mametsa, S. Laybros, A. Bergès, T. Volpert - Onera/Demr, Toulouse, France*

*P.F. Combes - Ups/Admm/Igeep, Toulouse, France*

*P. N'Guyen, P. Pitot - Oktal Se, Toulouse, France*

**ASYMPTOTIC FORMULATIONS AND SHOOTING RAY COUPLING FOR FAST 3-D SCATTERING FIELD EVALUATION FROM COMPLEX OBJECTS AND ENVIRONMENT - APPLICATIONS**

3:40 PM

*E.G. Pusone, P. van Genderen, L.P. Ligthart, J.S. van Sinttruijten - Irctr/Tu, Delft, Delft, NL*

**A THEORETICAL MODEL FOR ANALYZING THE RADAR CROSS SECTION AND DOPPLER OF SMALL**

**OBJECTS AT SEA, AT LOW GRAZING ANGLES, AND X-BAND FREQUENCIES**

4:20 PM

*A. Vallecchi - University of Florence, Florence, Italy*

**NOVEL RIGOROUS SOLUTIONS FOR SKEW  
INCIDENCE DIFFRACTION BY SOME SPECIFIC  
CLASSES OF ANISOTROPIC IMPEDANCE HALF-  
AND FULL-PLANES WITH ARBITRARILY  
ORIENTED ANISOTROPY AXES**

4:40 PM

*P. Grandi - Torino, Italy*

**PHYSICAL OPTICS APPROXIMATION AND  
GAUSSIAN BEAMS ASYMPTOTIC SOLUTION:  
A COMPARISON BETWEEN TWO DIFFERENT  
METHODS OF FIELD COMPUTATION IN PRESENCE  
OF A DIELECTRIC WEDGE**

5:00 PM

*V. Daniele, G. Lombardi - Politecnico di Torino, Torino, Italy*

**GENERALIZED WIENER-HOPF EQUATIONS FOR  
WEDGE PROBLEMS INVOLVING ARBITRARY  
LINEAR MEDIA**

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**Thursday, September 11, 2003, Sala Einaudi**

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**Session 23**

**SPECIAL SESSION ON  
RF ASPECTS OF MIMO AND SMART ANTENNAS**

**Organized by W. Wiesbeck**

Chair: W. Wiesbeck

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2:00 PM

*C. Waldschmidt, C. Kuhnert, W. Sörgel and W. Wiesbeck -  
University Karlsruhe, Karlsruhe, Germany*

**OPTIONS FOR THE INTEGRATION OF ARRAYS FOR  
MIMO INTO HANDHELDS**

2:20 PM

*M. Beach and C.M. Tan - University of Bristol, Bristol, UK*

**INDOOR DOUBLE DIRECTIONAL MEASUREMENTS**

2:40 PM

*H. Özcelik, M. Herdin, R. Prestros and E. Bonek - Universität  
at Wien, Wien, Austria*

**HOW MIMO CAPACITY IS LINKED WITH SINGLE  
ELEMENT FADING STATISTICS**

3:00 PM

*R. Thomä, D. Hampicke, M. Landmann, A. Richter,  
G. Sommerkorn - Technische Universität Ilmenau, Ilmenau,  
Germany*

**MEASUREMENT-BASED PARAMETRIC CHANNEL  
MODELLING (MBPCM)**

3:20 PM

*B.H. Fleury, X. Yin, and A. Kocian - Aalborg University, Aalborg, Denmark*

**IMPACT OF THE PROPAGATION CONDITIONS ON THE PROPERTIES OF MIMO CHANNELS**

3:40 PM

*J. Yeo, R. Mitra and V.V.S. Prakash - The Pennsylvania State University, University Park, USA*

**SOME NOVEL TECHNIQUES FOR EFFICIENT ANALYSIS OF MICROWAVE CIRCUITS AND ANTENNAS**

4:20 PM

*H. Rogier, D. De Zutter - Ghent University, Gent, Belgium*

**THE ACTIVE ELEMENT PATTERN METHOD AS A RIGOROUS MEANS TO TAKE INTO ACCOUNT MUTUAL COUPLING BETWEEN ARRAY ELEMENTS IN MIMO SYSTEMS**

4:40 PM

*A. Wittneben, B. Rankov - Swiss Federal Institute of Technology (ETHZ), Zurich, Switzerland*

**DISTRIBUTED ANTENNA ARRAYS VERSUS COOPERATIVE LINEAR RELAYING FOR BROADBAND INDOOR MIMO WIRELESS**

5:00 PM

*P-S. Kildal - Chalmers University of Technology, Gothenburg, Sweden*

*K. Rosengren - Flextronics Design AB, Sweden*

**MEASUREMENTS OF EFFECTIVE, APPARENT AND ACTUAL DIVERSITY GAIN OF TWO PARALLEL DIPOLES CLOSE TO A LOSSY CYLINDER IN A REVERBERATION CHAMBER**

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**Thursday, September 11, 2003, Sala Sella**

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**Session 24**

**SPECIAL SESSION ON  
ELECTRICAL ENGINEERING EDUCATION:  
MECHANISMS AND MOTIVATION**

**Organized by W.R. Stone**

Chair: W.R. Stone

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2:20 PM

*C. Kuhnert, S. Schulteis, C. Waldschmidt, W. Wiesbeck - University Karlsruhe, Karlsruhe, Germany*

**ANIMATIONS AND MOVIES IN ANTENNA LECTURES**

2:40 PM

*D. Erricolo, R.A. Matthes, P.L.E. Uslenghi, Carolyn C. Williams - University of Illinois at Chicago, Chicago, USA*

**AN UPDATE ON THE MASTER OF ENGINEERING PROGRAM AT UIC**



3:00 PM

*G. Pelosi, S. Selleri - Università di Firenze, Firenze, Italy*  
**COMPUTATIONAL METHODS FOR  
ELECTROMAGNETIC EDUCATION AT THE  
UNIVERSITY OF FLORENCE**

3:20 PM

*P. Meyer - University of Stellenbosch, Stellenbosch, South Africa*  
**TEACHING ELECTROMAGNETICS:  
THE STELLENBOSCH UNIVERSITY MODEL**

3:40 PM

*A.G. Tijhuis - Eindhoven University of Technology, Eindhoven, the Netherlands*  
**ELECTROMAGNETICS FOR THE CALCULATING  
STUDENT**

4:20 PM

*J.L. Volakis - The Ohio State University, Columbus, Ohio, USA*  
**A PERSPECTIVE ON THE RECRUITMENT,  
RETENTION AND EDUCATION OF GRADUATE  
STUDENTS IN RF ENGINEERING**

4:40 PM

**PANEL DISCUSSION**

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**Friday, September 12, 2003, Sala Sella**

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**Half-day Short Course on  
WIRELESS DATA NETWORKING**

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08:30÷12:30

**Instructors**

*Per-Simon Kildal\* and Stefano Maci\*\**

*\*Chalmers University of Technology, Gothenburg, Sweden.*

*\*\*University of Siena, Italy.*

In recent years there has been a lot of attention to using periodic structures in antenna design. These structures are nowadays referred to as photonic or electromagnetic bandgap structures or simply by their acronyms PBG or EBG structures. When such structures are used to obtain high-impedance surfaces, they are related to the transversely corrugated surface, that 15 years ago was generalized into a concept of soft and hard surfaces, based on a terminology used in acoustics and diffraction theory.

The course will relate the present PBG/EBG work to artificial magnetic conductors as well as to artificially soft and hard surfaces. The theory of ideal magnetic conductors and soft and hard surfaces will be explained in detail, as well as how to implement these theoretical models in existing software based on numerical methods such as GO, UTD, FDTD, FEM and moment method. We will also show how magnetic conductors and soft and hard surfaces can be realized artificially in practice, and how to analyze these realizations without having to model each detail of the periodic structure. This can be done by using unidirectional cur-

rent grids, asymptotic boundary conditions for strip grids and corrugations, homogenized boundary conditions, or impedance boundary conditions. The limitations of the different analysis models as well as surface realizations will be discussed with particular attention to diffraction effects, dispersion, surface waves, leaky waves, and bandgap properties.

The work will be presented in relation to specific applications most of which have already been published in scientific journals. Examples of applications are: ground planes, low-profile antennas, reduction of coupling, removal of parallel-plate noise in multilayer circuit boards, reduction of far out sidelobes, antenna gain enhancement, effective waveguide apertures, quasi-TEM waveguides, compact horn antennas, reduction of blockage from cylindrical objects, grid amplifiers, and infinite array simulators (realized in rectangular waveguide) for broadside radiation and dual polarization. The course will also cover related tunable surfaces used for beam steering and adaptive antennas.

PIAZZA  
CASTELLO

VIA

VIA

PO

VIA

VIA S. TERESA

VIA MARIA

VITTORIA

S. GIUSEPPE

PIAZZA

VIA

VIA

VIA

VIA XXI SETTEMBRE

VIA

VIA

GIOLITTI  
POMBIA

VIA ACCADEMIA ALBERTINA

SAN MASSIMO

ROMA

VIA

VIA

LAGRANGE

CAVOUR

C. ALBERTO

SAN FRANCESCO DA PAOLA

PIAZZA  
BODONI

CORSO VITTORIO EMANUELE II

VIA SACCHI

STAZIONE  
PORTA  
MILANO

VIA NIZZA



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