



## **Program**

# **24<sup>th</sup> International Conference on Applied Electromagnetics and Communications**

**27 – 29 September 2023  
Dubrovnik, Croatia**

## ICECom 2023 - Short Program

Wednesday, 27 <sup>th</sup> September 2023			
	Hall A	Hall B	Hall C
09:00-09:10	Opening ceremony	—	—
09:10-09:55	Plenary session Keynote lecture 1	—	—
09:55-10:40	Plenary session Keynote lecture 2	—	—
10:40-11:10	Coffee break		
11:10-12:30	Special Session on Wearable and Implantable Antennas and Sensors	New Communication Systems	—
12:30-14:30	Lunch break		
14:30-16:30	Invited Special Session on Terahertz Science and Applications	Special Session on Biomedical Applications of EM Fields (EMFs)	Panel Discussion: 5G EMF Measurement Challenges
16:30-17:00	Coffee break		
17:00-19:00	Invited Special Session on Terahertz Science and Applications	Computational and Numerical Techniques	Special Session: History of Electromagnetism in Croatia
19:15-21:00	Welcome cocktail		

Thursday, 28 <sup>th</sup> October 2023		
	Hall A	Hall B
08:30-10:30	Special Session on Electromagnetic Technologies in Medicine	Invited Special Session on Terahertz Science and Applications
10:30-11:00	Coffee break	
11:00-12:20	Special Session on Near-Field Focused Antennas and Metasurfaces Session on Measurement Accuracy	Electromagnetic Compatibility, Guided Waves and EMI
13:00-19:00	Excursion	

Friday, 29 <sup>th</sup> October 2023		
	Hall A	Hall B
09:00-11:00	Special Session on Physical Bounds of Antennas, Stored Energy and Lossy Media	Active Electromagnetic Structures
11:00-11:30	Coffee break	
11:30-12:50	Antenna Theory and Design	Remote Sensing and Local Positioning
13:00-13:15	Closing ceremony	—

## ICECom 2023 - Conference Program

Wednesday, 27 <sup>th</sup> September 2023	Hall A
<b>Opening Ceremony (09:00 – 09:10)</b>	

Wednesday, 27 <sup>th</sup> September 2023	Hall A
<b>Plenary Session (09:10– 10:40)</b>	
Chairs: Davor Bonefačić and Zvonimir Šipuš	

09:10	Anja K. Skrivervik <b>Microwave cavities for dual resonance atomic clocks</b> <i>Keynote lecture</i>
09:55	Francesco D'Agostino <b>NF–FF transformation techniques using a minimum number of NF data by means of the non-redundant sampling representations of the electromagnetic fields</b> <i>Keynote lecture</i>

Wednesday, 27 <sup>th</sup> September 2023	Hall A
<b>Special Session on Wearable and Implantable Antennas and Sensors: Design Strategies and Challenges</b> (11:10 – 12:30)	
Organizer: Sandra Costanzo	
Chairs: Sandra Costanzo and Zvonimir Šipuš	

11:10	Sandra Costanzo and Alexandra Flores <hr/> <b>Implantable Antennas for Endoscopy Applications: Current Review and Challenges</b>
11:30	Mingxiang Gao, Cong Ding, Zvonimir Šipuš, Mahsa Shoaran and Anja K Skrivervik <hr/> <b>Characterization of a Miniature Broadband Antenna for Implantable Neuromodulation Devices</b>
11:50	Sandra Costanzo and Adil Masoud Qureshi <hr/> <b>Minkowski- Based Miniaturized Planar Inverted-F Antenna Configurations for Wearable Applications</b>
12:10	Juraj Bartolić, Zvonimir Šipuš, Davor Bonefačić and Davorin Mikulić <hr/> <b>Open Waveguide Bidirectional Antenna for Efficient Launching of Creeping Waves for On-body Communication and Sensor Network Applications</b>

Wednesday, 27 <sup>th</sup> September 2023	<b>Hall B</b>
<b>New Communication Systems (11:10 – 12:30)</b>	
Chairs: Shean-Jen Chen and Radovan Zentner	

11:10	Ashish Sharma and Pranav Santosh Huilgol <b>Multiple channel network scheme employing hybrid FSO and NB-PLC for smart city environment</b>
11:30	Wei-Shiuan Huang, Chia-Wei Hsu, Feng-Chun Hsu and Shean-Jen Chen <b>Model Predictive Control for Adaptive Optics System in Free-Space Optical Communication</b>
11:50	Mohammad Ridwan Effendi, Rheyuniarto Sahlendar Asthan, Trasma Yunita and Achmad Munir <b>Performance Analysis of M-Ary PSK OWDM on Wireless Communication Systems</b>
12:10	Mohammed Saleh Hussein Al Salameh and Basma Akram M. Musa <b>COMSOL solutions for reducing radar cross section of drones</b>

Wednesday, 27<sup>th</sup> September 2023

Hall A

**Invited Special Session on Terahertz Science and Applications**  
(14:30-16:30)

Session organizer: Masayoshi Tonouchi

Chairs: Masayoshi Tonouchi and Iwao Hosako

14:30	Tadao Nagatsuma, Hideyuki Ohtake , Kazutoshi Kato, Junji Yumoto, and Hiroshi Ito <b>Photonics-empowered Terahertz Wireless Communications</b>
14:50	Iwao Hosako <b>Applications of Ultrafast Terahertz Radio</b>
15:10	Alexander Wolff, Lars Franke, Steffen Klingel, Janis Krieger, Lukas Mueller, Ralf Stemler and Marco Rahm <b>Continuous Beam Steering in a Defined Plane with a Reconfigurable Intelligent Surface at 31 GHz</b>
15:30	Taiichi Otsuji, Akira Satou, Victor Ryzhii, Maxim Ryzhii, Vladimir Mitin and Michael S. Shur <b>Physics of Graphene Dirac Plasmons and their Terahertz Device Applications</b>
15:50	Pavlo Sai, Maksym Dub, Vadym V. Korotyeyev, and Wojciech Knap <b>Terahertz Grating-Gate Plasmonic Crystals</b>
16:10	Kodo Kawase <b>Advances in injection seeded THz parametric generator</b>

Wednesday, 27 <sup>th</sup> September 2023	Hall B
<b>Special Session on Biomedical Applications of EM Fields</b> (14:30-16:30)	
Session organizers: A. Šarolić, R. Conceição, M. O'Halloran, M. Cavagnaro	
Chairs: Antonio Šarolić and Alessia Cannatà	

14:30	Alessia Cannatà , Atif Shahzad, Martin O'Halloran, Adnan Elahi, Marco Pasian, Simona Di Meo, Giulia Matrone, and Bilal Amin <b>Numerical Assessment of Microwave Bone Imaging: Reconstruction of Realistic Phantoms for Diagnosing Different Bone Diseases</b>
14:50	Giulia Sacco and Maxim Zhadobov <b>Impact of the Near-Surface Body Model on the User Exposure in mmWave 5G Bands</b>
15:10	Niko Ištuk, Hamza Benchakroun, Adnan Elahi, Martin O'Halloran, Rita Matta, David Moreau, Rodney O'Connor, and Eoghan Dunne <b>Reducing Sensing Volume Confounding Effects in Conductivity Measurements: The Use of a Miniaturised Four-Electrode Probe</b>
15:30	Antonio Šarolić, Marin Perić, Darka Kulić and Damir Sapunar <b>Neuromodulation by Electromagnetic Field Exposure in the Intermediate Frequency Range</b>
15:50	Mirtill Rohonczy, Attila Makkos-Weisz, Endre Pál, Dávid Pintér, Márton Kovács and Norbert Kovács <b>Repetitive transcranial magnetic stimulation can improve anxiety in Parkinson's disease: a randomized, double-blind, sham-controlled study</b>
16:10	Mirtill Rohonczy, Attila Makkos-Weisz, Endre Pál, Dávid Pintér, Márton Kovács and Norbert Kovács <b>Long-term effects of repeated repetitive transcranial magnetic stimulation in Parkinson's associated depression</b>



Wednesday, 27<sup>th</sup> September  
2023

Hall A

**Invited Special Session on Terahertz Science and Applications**  
(17:00 -19:00)

Session organizer: Masayoshi Tonouchi

Chairs: Masayoshi Tonouchi and Karl Unterrainer

17:00	Omar Khatib, Yang Deng, Simiao Ren, Jordan Malof and Willie J. Padilla <b>Physics Informed Deep Learning of Terahertz Metamaterials</b>
17:20	Benedikt Limabcher, Sebastian Schönhuber, Marie Ertl, Michael Jaidl, Hermann Detz, Max Andrews and Karl Unterrainer <b>Quantum Cascade Random Lasers for on-chip Machine Learning</b>
17:40	Masayoshi Tonouchi <b>Terahertz Emission Spectroscopy and Imaging for Semiconductor Manufacturing Process Monitoring</b>
18:00	Petr Kužel, T. Troha, F. Klimovič, T. Ostatnický, F. Kadlec and H. Němec <b>Ultrafast long-distance expansion of electron-hole plasma in GaAs probed by THz pulses</b>
18:20	Djero Peeters, Stan ter Huurne, Niels van Hoof, Jacobus L.M. van Mechelen and Jaime Gómez Rivas <b>Double Near-field THz Probe Microscopy</b>
18:40	Stephan Winnerl <b>Auger scattering in Landau-quantized graphene and <math>\text{Hg}_{0.83}\text{Cd}_{0.17}\text{Te}</math></b>

Wednesday, 27<sup>th</sup> September 2023

Hall B

**Computational and Numerical Techniques (17:00 -19:00)**

Chairs: Amedeo Capozzoli and Dragan Poljak

17:00	Gabriel Gaugain, Julien Modolo and Denys Nikolayev <b>Improving Precision of Computational Electromagnetics for Transcranial Stimulation</b> <i>Special Session on Biomedical Applications of EM Fields</i>
17:20	Amedeo Capozzoli, Ilaria Catapano, Claudio Curcio, Giuseppe D'Ambrosio, Giuseppe Esposito, Gianluca Gennarelli, Angelo Liseno, Giovanni Ludeno, and Francesco Soldovieri <b>A Deep Learning Approach to Electromagnetic Inverse Source</b> <i>Invited talk</i>
17:40	Anna Šušnjara and Dragan Poljak <b>Impact of different voltage source models on antenna current and input impedance within the boundary element method formalism</b>
18:00	Dragan Poljak, Sinisa Antonijevic and Vicko Doric <b>Direct Time Domain Calculation of Near Field of Dipole Antenna in the Presence of a Half-Space</b>
18:20	Fedir O. Yevtushenko <b>Threshold Analysis for the E-Polarized Modes of Microsize Graphene Strip Grating Laser</b>
18:40	Dubravko Tomić and Zvonimir Šipuš <b>Application of the Rigorous Coupled Wave Analysis for 1-D Periodic Dielectric Structures with Glide Symmetry</b>

Wednesday, 27 <sup>th</sup> September 2023	<b>Hall C</b>
<b>Panel Discussion: 5G EMF Measurement Challenges (14:30 – 16:30)</b>	

Wednesday, 27 <sup>th</sup> September 2023	<b>Hall C</b>
<b>Special Session: History of Electromagnetism in Croatia (17:00 – 18:00)</b>	
Chair: Davor Bonefačić	

17:00	Davor Bonefačić and Juraj Bartolić <b>RP8-24 - Microwave Transceiver for Radio Links</b>
17:20	Davor Bonefačić, Juraj Bartolić, Radovan Zentner and Silvio Hrabar <b>70 years of research, development and teaching in the fields of antennas and microwaves at the University of Zagreb</b>

Thursday, 28 <sup>th</sup> September 2023	Hall A
<b>Special Session on Electromagnetic Technologies in Medicine</b> (08:30 -10:30)	
Session organizers: S. Costanzo, A. Fanti, M. B. Lodi and R. Scapaticci	
Chairs: Sandra Costanzo and Zvonimir Šipuš	

08:30	Joo-Hiuk Son <b>Terahertz Radiation for Cancer Therapy?</b> <i>Joint Special Session on Terahertz Science and Applications and on Electromagnetic Technologies in Medicine</i>
08:50	Hitoshi Tabata, Hinano Sugimoto and Yuki Hamada <b>Terahertz Plasmonics and Hyperspectral Imaging for Bio-Medical Applications</b> <i>Joint Special Session on Terahertz Science and Applications and on Electromagnetic Technologies in Medicine</i>
09:10	Sandra Costanzo, Alexandra Flores and Giovanni Buonanno <b>Machine Learning Architectures for Microwave Imaging with Enhanced Reconstruction</b>
09:30	Rosa Scapaticci, Roberta Palmeri, Klementina Vdjak, Sandra Costanzo, Marta Cavagnaro and Lorenzo Crocco <b>Microwave Imaging as a means for Liver Ablation Monitoring: a Proof-of-Concept Experiment</b>
09:50	Matteo Bruno Lodi, Antonis Makridis, Konstantina Kazeli, Theodoros Samaras, Makis Angelakeris, Giacomo Muntoni, Alessandro Fanti and Giuseppe Mazzarella <b>A methodology for the measurement of the specific absorption rate of magnetic scaffolds</b>
10:10	Isabella Porcu, Giacomo Muntoni, Claudia Macciò, Matteo Bruno Lodi, Alessandro Fanti and Giuseppe Mazzarella <b>A Robust Multi-Band Sierpinski Gasket Monopole for Microwave Breast Cancer Imaging</b>

Thursday, 28 <sup>th</sup> September 2023	Hall B
<b>Invited Special Session on Terahertz Science and Applications</b> (09:10 – 10:30)	
Session organizer: Masayoshi Tonouchi	
Chairs: Masayoshi Tonouchi and Hiroaki Minamide	

09:10	Hiroaki Minamide <b>Advanced sub-terahertz-wave parametric oscillator with wide tunability of 0.3 THz to 0.9 THz</b>
09:30	Kosuke Murate, Sota Mine and François Blanchard <b>Terahertz parametric detection for broadband terahertz pulse</b>
09:50	Yutaka Kadoya, Shunya Takeyasu and Munehiro Nishida <b>Efficient extraction of terahertz wave totally reflected at semiconductor surface by double metal gratings</b>
10:10	Chiko Otani, Tomofumi Ikari and Yoshiaki Sasaki <b>Development of 300 GHz walk-through body scanner for security gate inspections</b>

Thursday, 28 <sup>th</sup> September 2023	Hall A
<b>Special Session on Near-Field Focused Antennas and Metasurfaces</b> <b>Session on Measurement Accuracy</b> (11:00 – 12:20)	
Session organizers: Sandra Costanzo and Giovanni Buonanno	
Chairs: Sandra Costanzo and Radovan Zentner	

11:00	Sandra Costanzo and Giovanni Buonanno <hr/> <b>Analysis of Near-Field Bessel Beam Focused Arrays with Random Perturbations for Biomedical Applications</b>
11:20	Sandra Costanzo and Giovanni Buonanno <hr/> <b>Statistical Tolerance Analysis of Biomedical Near-Field Focused Antenna Arrays</b>
11:40	Florindo Bevilacqua, Francesco D'Agostino, Flaminio Ferrara, Claudio Gennarelli, Rocco Guerriero, and Massimo Migliozzi <hr/> <b>3-D Probe Positioning Errors Correction in Plane-Polar Near-Field Measurements</b>
12:00	Radovan Zentner <hr/> <b>Challenges of Isotropy in Standardized 3-Axes EMF measurements</b>

Thursday, 28 <sup>th</sup> September 2023	Hall B
<b>Electromagnetic Compatibility, Guided Waves and EMI</b> (11:00 – 12:20)	
Chairs: Matteo Bruno Lodi and Antonio Šarolić	

11:00	Shih-Yi Yuan, Chia-Yu Tsai, Liang-Yang Lin, Yuan-Fu Ku and Wei-Sheng Liu <b>The development of Side-channel leakage platform on Hub-75 LED matrix data transmission protocol</b>
11:20	Scott Haydon and Adrian Sutinjo <b>Designing and understanding a PCB trace used to deliver EMI to a CMOS microchip using a GTEM</b>
11:40	Marco Simone, Matteo Bruno Lodi, Alessandro Fanti, Santi Concetto Pavone, Gino Sorbello, and Giuseppe Mazarella <b>Design of two in-line transitions for Q-band horn cluster</b>
12:00	Mohammed S. H. Al Salameh and Malak Rifat Al-zughool <b>Analytical solutions for the electric field of high-voltage direct current submarine cable</b>

Friday, 29 <sup>th</sup> September 2023	Hall A
<b>Special Session on Physical Bounds of Antennas, Stored Energy and Lossy Media</b> (09:00 – 11:00)	
Session organizers: Anja K. Skrivervik	
Chairs: Anja K. Skrivervik and Denys Nikolayev	

09:00	Mats Gustafsson <b>Spatial Degrees of Freedom for radiating systems</b>
09:20	Jakub Liška, Lukáš Jelínek and Miloslav Čapek <sup>2</sup> <b>Maximum Peak Radiation Intensity</b>
09:40	Icaro Veloso Soares, Erdem Cil and Denys Nikolayev <b>Physical Insights on Wireless Powering of Deep-Body Ultraminiature Bioelectronics</b>
10:00	Adrián Fernández Carnicero and Anja K. Skrivervik <b>Electrical characterization of biological solutions for implantable antenna design</b>
10:20	Ahmet Bilir and Sema Dumanli <b>In-body Antenna Design for Next Generation Hip Implants</b>
10:40	Davorin Mikulić, Juraj Bartolić, Davor Bonefačić and Zvonimir Šipuš <b>Analytic approximation of on-body path loss for wearable antennas</b>



Friday, 29<sup>th</sup> September 2023

Hall B

**Active Electromagnetic Structures (9:00 – 11:00)**

Chairs: Silvio Hrabar and Josip Lončar

9:00	Trasma Yunita, Chairunnisa, Aloysius Adya Pramudita and Achmad Munir <b>Inset-Fed Triangular Antenna Array with Switchable Circular Polarization</b>
9:20	Josip Lončar <b>Bandwidth and Stability of Reflection Amplifiers for Intelligent Reflecting Surfaces</b>
9:40	Silvio Hrabar <b>How to Accurately Predict Instability in non-Foster and Time-varying Circuits?</b>
10:00	Dominik Žanić and Silvio Hrabar <b>Dispersion and Stability Properties of Microwave Tunable Negative Inductance in CMOS Technology</b>
10:20	Boris Okorn, Dominik Žanić, Darin Nožina and Silvio Hrabar <b>Stability Analysis of Active Impedance Inverter based on Loss-compensated Passive Structure</b>
10:40	Darin Nožina and Silvio Hrabar <b>A non-Foster Solution to Broadband Directive Radiation Pattern in Huygens and Magnetoelectric Antennas</b>

Friday, 29 <sup>th</sup> September 2023	Hall A
<b>Antenna Theory and Design</b> (11:30 – 12:50)	
Chairs: Matteo Bruno Lodi and Angelo Liseno	

11:30	Úrsula C. Resende, William A. Oliveira, Túlio C. O. Carvalho, Fagner F. S. Ramalho and Icaro Veloso Soares <b>Design of a Compact Line-of-Sight Rectenna for Wireless Power Transfer Systems</b>
11:50	Marco Simone, Matteo Bruno Lodi, Nicola Curreli, Santi Concetto Pavone, Gino Sorbello, Giuseppe Mazzarella and Alessandro Fanti, <b>A Ka-band wideband antenna for Cubesat satellites</b>
12:10	Amedeo Capozzoli, Claudio Curcio, Francesco D'Agostino, Angelo Liseno and Luigi Pascarella <b>Optimized discretization of 1D radiating panels</b>
12:30	Claudia Macciò, Matteo Bruno Lodi, Nicola Curreli, Andrea Melis, Giacomo Muntoni, Giuseppe Mazzarella, Maurizio Bozzi and Alessandro Fanti <b>A 3D-Printed Wideband Sensor for Food Complex Permittivity Estimation Based on Double Ridge Waveguide</b>

Friday, 29 <sup>th</sup> September 2023	<b>Hall B</b>
<b>Remote Sensing and Local Positioning</b> (11:30 – 12:50)	
Chairs: Marko Bosiljevac and Davor Bonefačić	

11:30	Filip Turčinović, Marin Kačan, Dario Bojanjac and Marko Bosiljevac ----- <b>Impact of Ground Based SAR Parameters on Radar Data Based Object Classification</b>
11:50	Mihkel Tommingas, Sander Ulp, Muhammad Mahtab Alam, Ivo Mürsepp and Taavi Laadung ----- <b>Estimating UWB Positioning Integrity Based on Ranging Residuals</b>
12:10	Dewa Mahardika, Agus Dwi Prasetyo, Efrina Yanti Hamid and Achmad Munir ----- <b>A Straightforward Processing Algorithm for WLAN-based Local Positioning System</b>

Friday, 29 <sup>th</sup> October 2023	<b>Hall A</b>
<b>Closing Ceremony (13:00 – 13:15)</b>	