Preliminary Programme

WPTCE 2025

IEEE Wireless Power Technology Conference and Expo

JUNE 3-6, 2025 | ROME, ITALY

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FOREWORD

We are delighted to welcome you to the IEEE Wireless Power Technology Conference and Expo - WPTCE 2025, held in Rome, Italy, June 3-6, 2025, at the Faculty of Civil and Industrial Engineering of Sapienza University.

WPTCE is the world's largest event dedicated to wireless power, the leading international forum for researchers, academics, engineers, and industry professionals to exchange groundbreaking ideas, share their most recent innovations, and foster collaborations across disciplines and sectors. Traditionally rotating annually between Europe, North America, and Asia-Pacific, WPTCE serves as a global hub for innovation and knowledge exchange and networking in the field. The last edition was WPTCE 2024, Kyoto, Japan, and the next edition will be WPTCE 2026, Halifax, Canada.

WPTCE is the result of the merger between two prominent IEEE conferences: the Wireless Power Transfer Conference (WPTC) sponsored by the IEEE Microwave Theory and Technology Society (MTT-S) and the Workshop on Emerging Technologies: Wireless Power (WoW) sponsored by IEEE Power Electronics Society (PELS). These conferences, originally focused on different aspects of WPT, were first combined under the umbrella of Wireless Power Week (WPW) in 2018, and then fully integrated into WPTCE in 2023.

In addition to its long-standing sponsors, IEEE PELS and MTT-S, WPTCE 2025 proudly welcomes the IEEE Wireless Power Transfer Initiative as a first-time sponsor. The conference also benefits from the valuable technical support of the IEEE Electromagnetic Compatibility Society (EMC-S), Industrial Electronics Society (IES), Industrial Applications Society (IAS), and Magnetics Society. The IEEE WPT Initiative is dedicated to advancing the development, standardization, and widespread adoption of wireless power technologies. Bringing together multiple IEEE Societies, the Initiative serves as a collaborative platform for researchers, industry leaders, and policymakers to accelerate innovation in WPT systems. A key outcome of this Initiative will be the launch of the IEEE Journal on Wireless Power Technologies, slated for release in 2026.

WPTCE 2025 Rome offers a rich and comprehensive program that includes outstanding keynote presentations, wireless power school, workshops, tutorials, technical and industry paper sessions, panel discussions, and a student design competition. The preliminary technical program features 238 paper presentations, selected through a rigorous peer-review process. These papers cover a broad spectrum of topics in both near-field and far-field wireless power transfer, and will be presented through oral, poster, and special sessions. This remarkable level of international participation highlights both the high technical quality of WPTCE and its role as a premier global forum for knowledge exchange in wireless power technologies. Enhancing the technical sessions, an Exhibition will showcase commercial products and services in the WPT domain, offering further opportunities for engagement and collaboration. All the technical sessions and Exhibition will take place around the historic cloister of the Faculty of Civil and Industrial Engineering at Sapienza University of Rome, providing an inspiring backdrop for innovation and discussion. Throughout the conference, participants will enjoy high-level social events designed to foster networking and community building. Highlights include a Welcome Reception on the evening of Tuesday, June 3, and a Gala Dinner on Thursday, June 5, offering memorable moments in a convivial atmosphere.

We are especially grateful to Sapienza University of Rome for hosting WPTCE in such a rich and historic setting. The Faculty of Civil and Industrial Engineering is located very close to the archaeological area of Roman Forums and Coliseum. It was the former San Lorenzo in Panisperna convent, built over the ruins of Nero's Domus Aurea. At the heart of the venue is a Renaissance cloister, attributed to Giuliano da Sangallo, featuring Ionic columns with the Della Rovere crest and a beautiful central well by Simone Mosca, possibly finished by Michelangelo. Beneath it lies a medieval cistern, with a clever water filtration system that reflects the ingenuity of past engineering.

We are proud of the continuous growth of the WPTCE community and grateful to authors, reviewers, session organizers, sponsors, exhibitors, and committee members for their support and contributions. We invite you to fully engage in the conference, join sessions, visit the expo, and connect with fellow attendees. We hope you'll leave WPTCE 2025 inspired, informed, and energized for future collaborations.

Welcome to WPTCE 2025, and welcome to Rome!

Conference Chairs

Mauro Feliziani

Francesca Maradei

Welcome from the TPC Chairs

On behalf of the Technical Programme Committee, it is with great pleasure and deep appreciation that we present this year's Scientific Programme of the IEEE WPTCE 2025, held in the historic city of Rome, Italy, which reflects the continued growth, innovation, and diversity of the global wireless power community.

The preparation of the technical program is the result of a collective effort, and we would like to begin by expressing our heartfelt gratitude to the 120 expert reviewers who have played a critical role in the scientific management of the submitted abstracts. Through their diligence and professionalism, over 800 comprehensive reviews were completed in a timely manner, ensuring the integrity, quality, and fairness of the review process. Their commitment has enabled the assembly of a rigorous, engaging, and forward-looking scientific program that upholds the high standards of excellence traditionally associated with WPTCE.

This year, we received a total of 290 paper submissions, from which 238 regular papers were selected for presentation after a thorough peer-review process. These include 151 oral presentations and 87 poster presentations, organized into 33 technical sessions, including 9 special sessions, covering emerging and interdisciplinary themes. We are proud to note that contributions come from authors representing 42 countries, highlighting the international nature of this conference and the wide-reaching impact of wireless power research.

To ensure broad and meaningful engagement, poster sessions will be held on each day of the conference, with no parallel oral sessions. This structure allows all attendees to engage fully with both oral and poster presentations, fostering diverse modes of scientific interaction in-depth technical discussions.

We are especially grateful to Vincenzo Cirimele and Prof. Nuno Carvalho, the Special Session Chairs, for their outstanding efforts in encouraging the submission of high-quality proposals and coordinating the review and selection process for the ten special sessions. This year's keynote program brings together a distinguished group of speakers who will address a wide spectrum of timely and impactful topics within the wireless power domain. These include the integration of artificial intelligence in chip design, advancements in safety mechanisms and protective technologies, space-based solar power, wireless energy transfer for transportation, and scalable wireless power delivery from UAVs to remote or disaster-affected regions.

In addition to the technical sessions, WPTCE 2025 includes: a Wireless Power School, designed to provide foundational knowledge and insights for students and early-career researchers; Workshops and tutorials that delve into specialized and advanced topics; Panel discussions that explore strategic directions, challenges, and opportunities in the WPT field; student design competition, with 10 groups demonstrating their WPT designs.Finally, we would like to acknowledge and thank the WPTCE 2025 General Chairs for their leadership, and tireless work, and for fostering a collaborative and welcoming environment for all participants.

We sincerely hope that WPTCE 2025 in Rome will be a rewarding and inspiring experience for all attendees for advancing your research, sparking new collaborations, and contributing meaningfully to the global wireless power community.

We look forward to welcoming you in person in Rome.

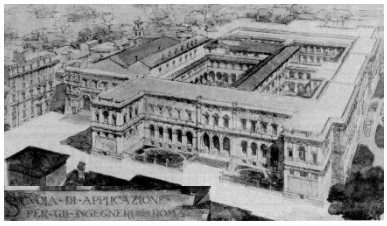
The Technical Programme Committee Chairs

Tommaso Campi

Alessandra Costanzo

VENUE

WPTCE2025 will be held in Rome at the ancient building of the Faculty of Civil and Industrial Engineering of Sapienza University of Rome, located in Via Eudossiana 18, Rome, Italy, in the historic centre of the city, directly overlooking the Colosseum. The site is at less than 20 minutes walk from Roma Termini rail station and few minutes walk from the metro stations of “Cavour” and “Colosseo” (Blue line B). The Faculty develops around the Cloister designed by Giuliano da Sangallo, that represents one of the most important examples of the Renaissance architecture in Rome and is next to the ancient Basilica of San Pietro in Vincoli, which is home to one of the magnificent sculptures of Michelangelo, namely the marble statue of Moses (1513-1515).



SAPIENZA
UNIVERSITÀ DI ROMA

Engineering Faculty, Sapienza University, ***Rome, Italy***

The Cloister consists of a rectangular colonnade. Each side has seven or eight arches supported by columns with beautiful ionic capitals, that show the emblem of Della Rovere family. In the centre of the courtyard, there is a well with an elegant octagonal plan, sculpted by Simone Mosca and surmounted by a simple easel composed by two couples of columns supporting a simple moulding architrave, credited to Michelangelo as well. Today it is the symbol of the Faculty. The atmosphere and the effects of light and shade created by these classical structures project an idea of harmony, and make this area a perfect place to sit and read, converse or relax.

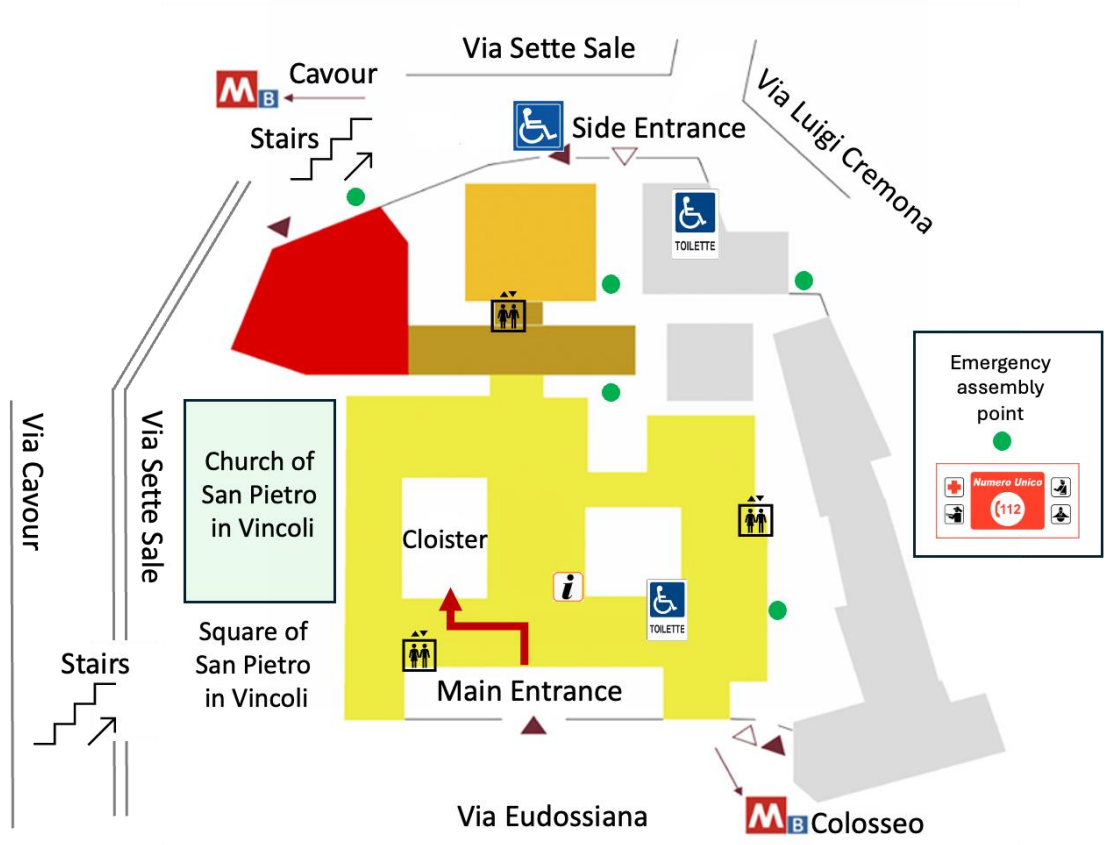
Google map

Via Eudossiana 18

Map of the ground floor of the Faculty of Civil and Industrial Engineering – Sapienza University.

HOW TO REACH THE VENUE

If you are near the Colosseum, you can take the escalators inside the metro station, then continue going up toward Largo della Polveriera, and from there turn left toward Piazza S. Pietro in Vincoli.
If you are along Via Cavour, you can take the stairs that lead up to San Pietro in Vincoli, or the ones near the Cavour Metro stop that lead up to Via delle Sette Sale. In this second case, you can turn right and move to the main entrance or turn left and enter from the back entrance on Via delle Sette Sale. This latter entrance is also reachable for those coming from Santa Maria Maggiore or Piazza Vittorio by crossing the Colle Oppio park.



Schematic map to reach the Faculty of Civil and Industrial Engineering – Sapienza University.

How to reach the venue by car

This is the least recommended method since parking in the area is very limited and paid, fines are expensive and sometimes cars are towed. To move by car it is recommended to use a satellite navigator to reach the venue of the event, since car mobility in Rome is very complex and constantly evolving.

How to reach the venue by public transport

By bus: Lines 81, 85, 87, 11, and 27 stop at the Colosseum. The first three connect Piazza San Giovanni and Piazza Venezia, while the last two connect Termini Station with the Monteverde district.

By tram: Trams no. 30, which connects the University City (Città Universitaria) with the Piramide Cestia, and no. 13, which connects Via Prenestina with the Monteverde district passing through Piazza San Giovanni, stop near the Colosseum.

By metro: Metro line B (blue line) stops at Cavour and Colosseo. It connects the venue to Termini Railway Station (which also links with national railways and Metro line A), the University City (Policlinico stop), and the urban railway network (Piramide and Tiburtina stations).

How to reach downtown from Leonardo da Vinci International Airport (Fiumicino - FCO)

By taxi: The taxi fare is €55, luggage included, for up to four passengers, for all destinations within the Aurelian Walls (which mark the city center). A taxi ride from/to the airport takes around 50 minutes and should never exceed 90 minutes even in heavy traffic (typically 7:30–9:30 and 17:30–19:30). Authorized taxis are yellow or white; surcharges and optional tips are not included in the meter fare.

By train: There is a convenient direct rail connection. The train station is located inside the airport and is easily accessible. From the baggage claim area, follow the signs to reach the train platforms via escalators and moving walkways that also accommodate luggage.
There are two train options:

- **Leonardo Express** is the non-stop service that connects Roma Termini station to Rome Fiumicino Airport in just 32 minutes. The service operates every 15 minutes *:
    - from Roma Termini from 04: 50 to 23: 35
    - from Fiumicino Airport from 05: 38 to 00 :23.

  Ticket price: only 14 euros! (see the official railway website for more info https://www.trenitalia.com/it/regionale/collegamenti-regionale/leonardo-express.html).
- **Metropolitan service (line FR1):** Regional trains line FR1 "Fara Sabina - Fiumicino Aeroporto" to/from other stations in Rome (departures every 15 minutes on weekdays, every 30 minutes on holidays). FR1 connects Fiumicino Airport with the stations Roma Tiburtina, Roma Tuscolana, Roma Ostiense (next to Piramide Metro stop –blue line B), and Roma Trastevere.. The fare is €8.00. (More info on the official railway website https://www.trenitalia.com/en.html)

By Bus:
Leonardo da Vinci FCO airport is served by different coach operators providing connection routes to Rome downtown. Information on timetables, routes and ticket prices can be found on the websites of the various companies.

Orientation map of Fiumicino International airport.

COTRAL
Stop: Terminal 1, Arrivals area.
Destinations: Rome's main underground stations (Termini, Tiburtina, Cornelia, Magliana, Ostia) and

to Fiumicino.
Where to buy tickets: at authorised sales outlets (newsagents, tobacconist's, etc.) or on board the bus, subject to an additional charge.

ROME AIRPORT BUS -SCHIAFFINI
Stop: BUS STATION adjacent to exit 6 of Terminal 3 - Arrivals, bus stand no.15.
Destinations: Rome (Termini).
Where to buy tickets: online, at the T3 Bus Station ticket office or directly on board the bus.

SIT BUS SHUTTLE
Stop: BUS STATION adjacent to exit 6 of Terminal 3 - Arrivals, bus stand no.12
Destinations: Rome (Vatican, Aurelia, Termini).
Where to buy tickets: online ticket office or directly on board the bus.

T.A.M. Bus Srl
Stop: BUS STATION adjacent to exit 6 of Terminal 3 - Arrivals, bus stand no.13
Destinations: Rome (Ostiense, Termini).
Where to buy tickets online, at the T3 Bus Station ticket office or directly on board the bus.

TERRAVISION
Stop: BUS STATION adjacent to exit 6 of Terminal 3 - Arrivals, bus stand no.14
Destinations: Rome (Termini).
Where to buy tickets online, at the T3 Bus Station ticket office or directly on board the bus.

How to reach downtown from Ciampino Airport (CIA)

By taxi: The taxi fare is €40, luggage included, for up to four passengers, for all destinations within the Aurelian Walls (which mark the city center). A taxi ride from/to the airport takes around 50 minutes and should never exceed 90 minutes even in heavy traffic (typically 7:30–9:30 and 17:30–19:30). Authorized taxis are yellow or white; surcharges and optional tips are not included in the meter fare.

By Bus:
Rome Ciampino Airport can be reached with a number of buses. The service operates every day, from Monday to Sunday. Tickets can be purchased online, at the authorized agents located in the Arrival Terminal or on board the bus. **All the bus stops are opposite International Departures.** For information on timetables, routes, and the cost of tickets see the websites of the various bus companies

A daily connection between the airport and **Rome Termini railway station** is provided by these companies:

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ATAC
Circular line number **720** connects the airport to **Roma Laurentina**.
Circular line number **520** connects the airport to **Roma Cinecittà and Subaugusta**.
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TOURIST INFO

Rome weather in early June is very warm and mostly sunny with up to 15 hours of sunlight per day. The average temperature rarely falls below 23°C and often rises to highs of 30°C during the warmest time of the day. The average temperature is around 25°C in the Conference period. The Conference venue is located on a hill called Colle Oppio, an area close to Rione Monti whose charm and village atmosphere make it a favourite area for locals and tourists to relax and taste the true roman lifestyle. In this area, very close to the Colosseum and the Roman Forum, many hotels and hundreds of restaurants and bars cater for all tastes and budgets are available at walking distance. There is so much to see and to do in Rome that it is impossible to make a list or give some advice. We only suggest you visit the Moses, a masterpiece sculpture by the Italian High Renaissance artist Michelangelo Buonarroti, housed in the church of San Pietro in Vincoli (St. Peter in Chains), which is adjacent at the Faculty of Engineering, venue of the conference. If you are looking for touristic information you may start your search from https://www.turismoroma.it/, the city's official tourist portal run by Rome's town hall.

TT TECHNICAL PROGRAMME

KEYNOTE SPEAKERS

Akimasa Hirata, Nagoya Institute of Technology, Japan

"*International Exposure Guidelines for Human Protection from Electromagnetic Field – Application to Wireless Power Transfer Systems*"

Wednesday, June 4, 8:45-10:15

Abstract: When new wireless technologies emerge, there are public concerns about the potential adverse health effects of electromagnetic fields. Unlike other devices used in wireless communications, the leaked or emitted field strength from Wireless Power Transfer (WPT) systems would be significant, even with high transmission efficiency, due to the potentially high-power transfer involved. To protect humans from electromagnetic fields, international guidelines and standards have been issued by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and IEEE. In these guidelines, the lowest threshold for substantiated adverse health effects is electrostimulation at frequencies below 100 kHz and heating above 100 kHz. Consequently, the physical quantities, including their averaging time, used for setting the limits differ based on frequency. In this talk, the general procedure for compliance assessment will be briefly explained for different WPT systems, including those used for electric vehicles (at 85 kHz) and magnetically coupled resonance systems operating in the MHz band. Additionally, ICNIRP activities related to WPT applications will be mentioned briefly, including the status of low-frequency guidelines revision.

Biography: Akimasa Hirata received the B.E. and PhD. Degrees in communications engineering from Osaka University, Suita, Japan, in 1996 and 2000, respectively. In 2001, he joined the Department of Communications Engineering, Osaka University, as an Assistant Professor. In 2004, he moved to Nagoya Institute of Technology, where he is currently Professor and Director of research center. His research interests include electromagnetic safety, risk management system for heat-related illness, methods in neuroscience, antennas, and related computational techniques. Prof. Hirata is Chair of International Commission on Non-Ionizing Radiation Protection. He received several awards including the Japan Academy Medal and JSPS Prize (2018), Japan Open Innovation Prize (President of the Science Council of Japan Prize in 2022) from the Cabinet Office, and IEEE EMC-S Richard R. Stoddart Award (2023). He is a Fellow of IEEE, Institute of Physics, IEICE, and IEE Japan

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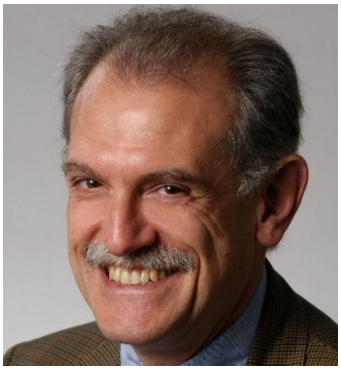


Alberto Sangiovanni Vincentelli, University of California, Berkeley, USA

"*AI for semiconductor design: Hype or Reality?*"

Wednesday, June 4, 8:45-10:15

Biography: Alberto Sangiovanni Vincentelli is the Edgar L. and Harold H. Buttner Chair of Electrical

Engineering and Computer Sciences at the University of California, Berkeley and a member of BAIR (Berkeley Artificial Intelligence Research) Lab. He is an author or coauthor of over 1000 papers, 17 books and 3 patents in design tools, cyber physical systems, and Artificial Intelligence (h-index 127). He is an IEEE and ACM Fellow, a member of the National Academy of Engineering and of the American Academy of Arts and Sciences. He is a co-founder of Cadence and Synopsys, the two leading companies in Electronic Design Automation with a capitalization of over 160 Billion USD. Currently, he is a member of the following boards of directors: Cadence (US), KPIT Technologies (India), eGap, and Cy4Gate. He is Chairman of the Board of Quantum Motion (UK), Innatera (NL), Glaucus (US), e4Life, Exein, and Phononic Vibes (ITA). He consulted for many companies in USA (e.g., IBM, Intel, Texas Instruments, GE, HP, ATT, GTE, United Technologies, and General Motors), Europe (e.g., Alcatel, Mercedes, BMW, Magneti Marelli, SGS Thomson, Elettronica, Pirelli, TIM, Selenia, Camozzi, ENI, and ENEL) and Japan (e.g., Fujitsu, Hitachi, NEC, Kawasaki Steel, Toshiba and Matsushita). From February 2010 to December 2020, he had been a member of the Executive Committee of the Italian Institute of Technology, where he is now a member of the Technical Scientific Committee. In September 2023, he was appointed President of Chips.it, the 250M Euro Foundation of the Italian Government to foster integrated circuit design. He is the Chairperson of the Strategy Board and of the International Advisory Board of the Milano Innovation District (MIND). He is the Chairperson of the Berkeley SkyDeck Accelerator Academic Advisors and is the special advisor of the Dean of Engineering, Berkeley, for entrepreneurship. Alberto is the recipient of several academic honors including the IEEE/RSE James Clerk Maxwell Medal "for groundbreaking contributions that have had an exceptional impact on the development of electronics and electrical engineering or related fields" and the 2023 BBVA Frontiers of Knowledge Award in the Information and Communication Technologies category: "for transforming chip design from a handcrafted process to the automated industry that powers today's electronic devices". Alberto obtained an electrical engineering and computer science degree ("Dottore in Ingegneria") summa cum laude from the Politecnico di Milano, Italy in 1971 and holds four Honorary Doctorates from University of Aalborg (Denmark), KTH (Sweden), AGH (Poland) and University of Rome, Tor Vergata.

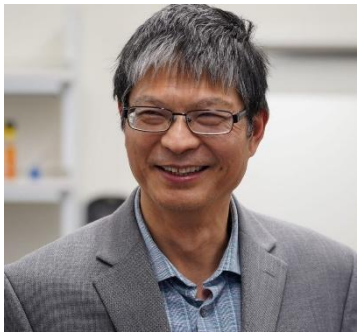
Volker Ziegler, Airbus Central Research and Technology, Germany

"For the skies: Exploring tomorrow's wireless power transfer technologies"

Wednesday, June 4, 14:00-15:30

Abstract: Wireless power transfer (WPT) is transforming our daily life by enabling convenient, cable-free charging of devices and cars amongst other new user experiences and services. These innovations are raising the exciting question: Can these short- and long-range WPT technologies also revolutionize certain aspects of airplanes and satellites or even pave the way to renewable energy sources from space and airborne energy distribution networks ?

Biography: Volker Ziegler received his Dipl.-Ing. degree in electrical engineering and his Dr.-Ing. degree (with honors) both from the University of Ulm, Germany, in 1997 and 2001, respectively. From 2002 to 2003, he was a member of the "Knowledge Exchange Group for Research and Technology" at the DaimlerChrysler AG in Stuttgart, Germany. Afterwards, he joined EADS Innovation Works, Ottobrunn, Germany, where he became an EADS Expert for "Microwave Technologies and Systems" in 2007. From 2013 to 2017, he was the Team Leader for "RF and Waveforms" as well as for "Automatic Flight Systems" and Ho Dept. "Automatic Flight and Communications". Since 2018, he is the Head of Department "Communication Technologies" within Airbus Central Research and Technology, responsible for the advanced research performed in the field of RF and optical communication systems as well as embedded computing platforms for aeronautic and space-borne platforms. Volker Ziegler is senior member of the IEEE and a founding member of the TC 29 on Microwave Aerospace Systems, member of the IEEE MTT Antennas & Propagation German Chapter Executive Board and the VDI ITG focused group on microwave technologies. He authored or co-authored more than 100 papers, holds 15 patents.



Chris Mi, San Diego State University, USA

"High-power bidirectional wireless charging of electric vehicles"

Thursday, June 5, 8:45-10:15

Abstract: Wireless power transfer (WPT) has proven to be beneficial in certain applications, including consumer electronics and electric vehicle charging, in particular with autonomous vehicles. However, the additional cost of wireless charging compared to conventional conductive charging, coupled with safety (foreign objects) and interoperability, has hindered the commercialization of WPT system. On the other hand, high-power bidirectional WPT systems with extremely high efficiency up to 97%, can provide many advantages, including supplying power during a power outage, fast and convenience of charging (anywhere and anytime), reduced cost due to shared charging facility, and the capability to help the grid operation (frequency control, resiliency, reliability). In this talk, we will explore the different topologies that are suitable for high-power bi-directional wireless charging of EVs. We will propose solution that can enhance the efficiency and reduce cost, including the use of double-sided LCC topology, wideband gap devices, novel magnetic materials, and model predictive control.

Biography: Dr. Mi is a Distinguished Professor of Electrical and Computer Engineering at San Diego State University. He is a Fellow of IEEE and SAE, and the Director of Cali & Daniel Chang Center for Electric Drive Transportation. He was previously a faculty member at the University of Michigan-Dearborn from 2001 to 2015, and an Electrical Engineer with General Electric from 2000 to 2001. He also served as the CTO of 1Power Solutions and EV Safe Charge. Dr. Mi received his Ph. D from the University of Toronto, Canada, in 2001. Dr. Mi has published five books and 370 papers. He served as Editor-in-Chief, Area Editor, Guest Editor, and Associate Editor of multiple IEEE Transactions and international journals, as well as the General Chair of over ten IEEE international conferences. Dr. Mi has won numerous awards, including the "Distinguished Teaching Award" and "Distinguished Research Award" from the University of Michigan, IEEE Region 4 "Outstanding Engineer Award," IEEE Southeastern Michigan Section "Outstanding Professional Award," and SAE "Environmental Excellence in Transportation (E2T) Award." He is the recipient of three Best Paper Awards from IEEE Transactions on Power Electronics and the ECCE Student Demonstration Award. In 2019, he received the Inaugural IEEE Power Electronics Emerging Technology Award. In 2022, he received the Albert W. Johnson Research Lectureship and was named the Distinguished Professor, the highest honor given to an SDSU faculty member, and only one award is given each year. Most recently, he received the 2023 IEEE PELS Vehicle and Transportation Systems Achievement Award, the IEEE Transactions on Industry Applications Best Paper Award, the SDSU Innovator of the Year Award.

Duan Baoyan, Xidian University, Xi'an, China

"The Sun-chasing project: Innovation, simulation, prototype and experiment"

Thursday, June 5, 14:00-15:30

Abstract: Nuclear fusion (NF) and space solar power station (SSPS) are the known technologies to break the energy crisis faced by human society. As far as SSPS is concerned, one of the key technologies is microwave power transfer (MPT) with long range and high power, which is of widely applications in astronautic, aeronautic, near space, Internet of things, low attitude economy, remote area and so on. This report

introduces systematically the state-of-the-art MPT, SSPS, AI aided MPT and electromechanical coupling (EMC) technologies. Firstly, the OMEGA innovation design of SSPS and MPT is presented. Secondary, the transmission technology with high power and narrow beam—high beam collection efficiency (BCE) is developed. Thirdly, high efficiency and high power rectify technology as well as information—power transfer simultaneously is descried. Fourthly, the technology of AI aided MPT is discussed. And finally, The Sun chasing project: the OMEGA-SSPS prototype with whole links and whole systems and experiment result are given in detail to demonstrate the innovation design and key technologies.

Biography: Duan Baoyan received Ph.D. with Electromechanical Engineering from XDU in 1989. He then studied, from 1991 to 1994, as Postdoctoral Fellow at Liverpool University, U.K. and worked, in 2000, as Visiting Scientist at Cornell University, USA. He is currently a full Professor in the School of Electromechanical Engineering at XDU, where he founded State Key Lab. of Electromechanical Integrated Manufacturing of High-performance Electronic Equipment, China. His has been dedicating himself in research of electromechanical engineering and opened a new area of electromechanical coupling (EMC) theory among electromagnetic, structural deformation and temperature fields of microwave electronic equipment (MEE). He has made known the influence mechanism (IM) of nonlinear mechanical parameters on electronic performance of MEE. He developed the integrated design methodology of MEE based on EMC and IM. The above academic achievements have been successfully applied in national major engineering projects such as the deep space exploration, the spacecraft, space deployable antenna, FAST and so on. He is Fellows of Int. Engineering and Technology (IET), Chinese Institute of Electronics (CIE) and Int. Society for Structural and Multidisciplinary Optimization (SMO). He is engaged as the associate editors of Int. Journals such as Solar Energy Research, ACTA Astronautics, Simulation & Multidisciplinary Design Optimization, IEEE Transaction on Internet of Things (IoT), Automation and Intelligence and so on. He is also the Section editor-in-chief of CAE flagship magazine ENGINEERING, the editor-in-chief of Electromechanical Engineering (EME) of China and editor-in-deputy chief of Chinese Journal of Electronics (CJE). He has published 400 papers and six books, authorized 40 patents of invention. He has received, as the first contributor, the 1st prize of national award for science and technology progress (STP) of China 2020, and the 2nd prize of national award for STP of China three times (2004, 2008 and 2013). In 2009, he was selected as science Chinese person. In 2012, he was issued Hong Kang HLHL prize of STP. In 2017, he received award for outstanding scientific and technological achievement from CAS and the golden prize of “good design” of China. In 2018, he received the Fellow achievement award from Asian Society of SMO. In 2021, he received the highest STP award from Shaanxi province of China and the award for Qian Xuesen outstanding contributions to the space flight of China. CCTV (China Central Tele Vision station) broadcasted a special program DUAN Baoyan: Minor discipline and Great Vision in 2016. 《Ren Min Ri Bao》 broadcasted a special program DUAN Baoyan: Linking the end of Universe with science and technology in 2021.

Prof. Zoya Popovic, University of Colorado, Boulder, USA

“Scalable X-band rectenna arrays for energy-denied environments”

Friday, June 6, 8:45-10:15

Abstract: In this talk, the design and characterization of a scalable 10-GHz rectenna array is discussed, with applications in emergency power delivery from an airborne transmitter such as a UAV to a energy-denied environment (e.g. earthquake region at night). In such a scenario, it is desired to have easy deployment, low cost and easy storage. Additionally, scalability is important to accommodate varying power densities and electrical load needs. Demonstrations are presented for arrays that are 7, 20 and 33.3 square wavelengths in size with 25, 225 and 625 rectifying elements, respectively. Each rectifier is connected to 4 patch antennas, resulting in 2500 antenna elements for the largest array. The arrays are fabricated on foam supporting a flex

single-sided metallized substrate, with a copper fabric ground plane, making scaling of flexible arrays possible.

Biography: **Zoya Popovic** (S'86-M'90-SM'99-F'02) is a Distinguished Professor and the Lockheed Martin Endowed Chair in Electrical Engineering at the University of Colorado, Boulder. She obtained her Dipl. Ing. degree at the University of Belgrade, Serbia, and her Ph.D. at Caltech. She was a Visiting Professor with the Technical University of Munich in 2001/03, and Chair of Excellence at Carlos III University in Madrid in 2018/19. She has graduated over 70 doctoral students. Her research interests are in microwave and millimeter-wave high-performance III-V semiconductor circuits, medical applications of microwaves, wireless powering, industrial microwave applications and quantum RF sensing. She is a Fellow of the IEEE and the recipient of two IEEE MTT Microwave Prizes for best journal papers, the White House NSF Presidential Faculty Fellow award, the URSI Issac Koga Gold Medal, the ASEE/HP Terman Medal and the German Alexander von Humboldt Research Award. She was named IEEE MTT Distinguished Educator in 2013 and is a Fellow of the National Academy of Inventors and a Member of the National Academy of Engineering.

Prof. Greg Durgin , Georgia Tech, Atlanta, USA

"Space Solar Power: Closer Than You Think"

Friday, June 6, 14:00-14:30

Abstract: We discuss several innovations from different technical areas that are colliding to enable one of the most ambitious and aspirational technologies: solar power from space beamed to the earth on a microwave link. Launch costs continue to drop. We are finally seeing mass production and wide-area additive manufacturing enter the world of spacecraft design. But perhaps most surprisingly, PaddleSat architecture promises to revolutionize spaceborn infrastructure, resulting in lightweight spacecraft that do not require propulsion or batteries to perform their operations. The talk unpacks this collision of technologies and explains what it will mean for the future of clean energy.

Biography: Prof. Gregory D. Durgin joined the faculty of Georgia Tech's School of Electrical and Computer Engineering in Fall 2003 where he serves as a professor. He received the BSEE (96), MSEE (98), and PhD (00) degrees from Virginia Polytechnic Institute and State University. In 2001 he was awarded the Japanese Society for the Promotion of Science (JSPS) Post-doctoral Fellowship and spent one year as a visiting researcher with Morinaga Laboratory at Osaka University. He has received best paper awards for articles coauthored in the *IEEE Transactions on Communications* (1998 Stephen O. Rice prize), *IEEE Microwave Magazine* (2014), *IEEE WiSEE Conference* (2023), and *IEEE RFID Conference* (2016, 2018, 2019) as well as the 3rd place 2020 Nokia Bell Labs Prize for "Hyper-RFID: a Revolution for The Future of RFID." Prof. Durgin authored *Space-Time Wireless Channels* (2002), the first textbook in the field of space-time channel modeling which has influenced multiple generations of commercial cellular technologies. Prof. Durgin founded the Propagation Group (http://www.propagation.gatech.edu) at Georgia Tech, a research group that studies radiolocation, radio measurement, RFID-related technology, and applied electromagnetics. He is a winner of the NSF CAREER award as well as numerous teaching awards, including the Class of 1940 Howard Ector Outstanding Classroom Teacher Award at Georgia Tech (2007). He is a Fellow of the IEEE that has served on the editorial staff for *IEEE RFID Virtual Journal*, *IEEE Transactions on Wireless Communications*, and *IEEE Journal on RFID*. He also serves as President for the IEEE Council of RFID (CRFID). He served as an IEEE CRFID Distinguished Lecturer (2015-2018), IEEE CRFID VP of Conferences (2020-2021), and as general/executive chair of many IEEE conferences. His educational channel #profdurgin on YouTube instructs viewers on engineering electromagnetics and RFID-related topics, having drawn over 13,000 subscribers and over 1 million views. He is a frequent consultant to industry, advising numerous multinational corporations on wireless technology and a distinguished lecturer of the Space Solar Power Institute.

WPT SCHOOL, WORKSHOPS & TUTORIALS

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WPT SCHOOL

FUNDAMENTALS OF INDUCTIVE POWER TRANSFER

Organizer: **Grant A. Covic**, University of Auckland, New Zealand
Speakers: **Duleepa J. Thrimawithana ,** University of Auckland, New Zealand
Grant A. Covic, University of Auckland, New Zealand
Paul D. Mitcheson, Imperial College London, U.K.

TUESDAY JUNE 3, 2025
Room Aula 1, 09:00-12:30

Summary: Wireless power today is being applied to many developing applications, each of which has different interesting and challenging targets for development that include; gap and misalignment, weight and size, efficiency, thermal management, uni- and bi-directional power flow control and interoperability across various supplier platforms. In high power applications industrial, and electrified transportation have been key focuses for the past two decades, using frequencies from 20-100kHz. For lower power systems such as drones, smart devices and lightweight instrumentation or appliances much higher frequencies are often of interest.

Wireless technologies help overcome barriers that other wired solutions simply cannot. For example, there is a strong drive to electrify the transportation sector as a solution to the environmental and economic impacts of vehicles using internal combustion engines. However, to-date, limitations of battery technologies have hindered the uptake of electric vehicles (EVs) particularly for medium and heavy duty fleets. The main drawbacks commonly associated with EVs are the limited range and long charging times, both of which are a direct result of the low energy and power densities of current battery technologies. These issues are further aggravated due to the fact that the EVs need to be plugged-in to refuel, as it can take many hours to fully-charge a depleted EV battery. Although, fast and extreme fast charging systems have been developed and deployed to help EV users refuel in a fraction of an hour, this is achieved at the expense of battery life and user safety. In contrast, wireless charging of stationary and in-motion electric vehicles promises a future where EVs are replenished organically, thus avoiding long charging times, range anxiety and battery degradation. An ubiquitous wireless charging infrastructure, especially one that is bi-directional, can be used to provide grid services, thus not only drastically improving the uptake of EVs, but also supporting grids with high penetration of renewable electricity.

The school will start with a brief discussion on the history of wireless power transfer (WPT) technology. Subsequently, the fundamental operating principles of an inductive power transfer (IPT) system will be presented. Commonly used compensation networks, power electronics converters and magnetic designs will be then reviewed. This will be followed by a discussion on a few applications of IPT technology, with a special focus on wireless electric vehicle (EV) charging. A summary of developments to-date on both stationary and dynamic EV charging will be presented. WPT can also be used as a power delivery method in other applications, particularly in dirty or dangerous environments, e.g. industrial, medical and supply chain, space, light transport etc. As such other applications will be discussed where light weight is extremely important, along with Multi MHz approaches that can be useful in achieving low weight, and basic magnetics and circuit design for MHz IPT.

Some design examples will be provided that can be validated using LTspice and Ansys Maxwell simulation models. Participants post school, should continue to supplement their understanding using

free software such as - LTspice and Ansys Electronics Desktop Student .to evaluate circuits and magnetics.

Speakers' Bio:

Duleepa J. Thrimawithana (M'06-SM'18), received his BE in Electrical Engineering (with First Class Honors) in 2005 and his Ph.D. in power electronics in 2009 from The University of Auckland, Auckland, New Zealand. From 2005 to 2008, he worked in collaboration with Tru-Test Ltd. in Auckland as a Research Engineer in the areas of power converters and high-voltage pulse generator design. He joined the Department of Electrical and Computer Engineering at The University of Auckland in 2009 where he currently works as a Senior Lecturer. He has co-authored over 100 international journal and conference publications and holds 24 patent families on wireless power transfer technologies. In recognition of his outstanding contributions to engineering as an early carrier researcher, Dr. Thrimawithana received the Jim and Hazel D. Lord Fellowship in 2014. His main research areas include wireless power transfer, power electronics and renewable energy.

Grant A. Covic (S'88-M'89-SM'04), is a full professor with the Electrical, Computer, and Software Engineering Department at The University of Auckland (UoA). He began working on inductive power transfer in the mid 90's, and by early 2000's was jointly leading a team focused on AGV and EV charging solutions. He has published more than 200 international refereed papers in this field, worked with over 30 PhDs and filed over 40 patent families, all of which are licensed to various global companies in specialised application fields. Together with Prof. John Boys he co-foundered HaloIPT and was awarded the NZ Prime Minister's Science Prize, amongst others for successful scientific and commercialization of this research. He is a fellow of both Engineering New Zealand, and the Royal Society of New Zealand. Presently he heads inductive power research at the UoA, is directing a government funded research program on stationary and dynamic wireless charging of EVs within the road, while also co-leading the interoperability sub-team within the SAE J2954 wireless charging standard for EV

Paul D. Mitcheson (SM) received the M.Eng. degree in Electrical and Electronic Engineering and the Ph.D. degree in Micropower Motion Based Energy Harvesting for Wireless Sensor Networks from Imperial College London, London, U.K., in 2001 and 2005, respectively. He is currently a Professor in Electrical Energy Conversion with the Control and Power Research Group, Electrical and Electronic Engineering Department, Imperial College London. His research interests include energy harvesting, power electronics, and wireless power transfer to provide power to applications in circumstances where batteries and cables are not suitable. His research has been supported by the European Commission, Engineering and Physical Sciences Research Council, and several companies. Prof. Mitcheson is a fellow of the Higher Education Academy and is on the Executive Committee of the U.K. Power Electronics Centre. He was the General Co-Chair of IEEE Wireless Power Week in 2019 in London, U.K. and is chair of IEEE PELS TC-9, Wireless Power.

BASIC THEORY AND TECHNOLOGY OF ANTENNAS FOR RADIATIVE WIRELESS POWER TRANSFER

Organizer: **Naoki Shinoara**, Kyoto University, Japan
Speakers: **Keisuke Noguchi**, Kanazawa Institute of Technology, Japan
Ricardo A. M. Pereira, University of Aveiro, Portugal
Paolo Rocca, University of Trento, Italy

TUESDAY JUNE 3, 2025
Room Aula 1, 13:30-17:00

Summary: We can classify Wireless Power Transfer (WPT) into 2 major technologies, coupling WPT via magnetic/electric fields and radiative WPT via electromagnetic waves. The main differences between them are the transmitting/receiving devices to transmit power. We use a non-radiative resonator for the coupling WPT with long wavelength, such as a coil, to create the magnetic field, or a metal plate to create the electric field. In radiative WPT, we use antennas as the radiative resonator which use electromagnetic waves that propagate freely through space.. The differences between the coupling and the radiative are fundamental and we need specific theory and technology for each WPT category. Antenna theory and technology is required for advanced radiative WPT industry development. At the moment, commercialization of radiative WPT is expected and has already started. In parallel, discussion of the standards and regulations has already started in IEEE and in the world.

In this school, you can learn antenna theory and technology specific for radiative WPT. Current radiative WPT market has already started in wide beam WPT, where multiple users can receive a weak radio wave power without beam forming. It is similar to Tesla's dream in the end of 19th century, "people everywhere on the Earth can receive the wireless power". In wide beam WPT, the receiving small antenna technology is most important to increase the received power and to improve user convenience. This is similar to radio broadcast, that is transmitted for all users to receive. On the other hand, we can develop narrow beam WPT, to focus high power waves towards one user with higher beam efficiency. In 1960s, W. Brown re-started the WPT R&D with microwaves in the narrow beam WPT and he has reached 54% DC-microwave-DC total efficiency in his laboratory at a distance of approximately 2 m. In narrow beam WPT, we need to increase the beam efficiency in the restriction of Friis transmission formula. At last, we need a beam forming technology by phased array antennas to use the full potential of radiative WPT with high beam efficiency to a user wherever he/she is. The beam forming technology advanced the commercial radiative WPT both to increase the WPT efficiency for user convenience and to supress unwanted interference to the existing wireless system and to reduce the safety issue by the radio waves. From 1990s, there were a lot of field WPT experiments with phased array antennas in Japan. In 2050, the Space Based Solar Power, power from space, will be realized with the narrow beam WPT with huge, accurate, and high efficiency phased array antenna.
After completing this school, you can design the best and optimum antennas for required radiative WPT. We hope that the audience will become engineers who will promote WPT in the future.

Application of Small Antennas for WPT Receivers: Design of High-impedance Antennas
Keisuke Noguchi, Kanazawa Institute of Technology, Japan

Abstract - Electrically and physically small antennas are required for all wireless systems. In particular, physically compact antennas that can be built into devices such as smartphone and IoT equipment are desirable. Rectenna, which is a receiver for wireless power transfer and energy harvesting, also requires high performance small antennas to increase the receiving power.
In this lecture, the classification of small antennas and their basic characteristics are described, and the relationship between antenna size and characteristics is summarized. Theoretical limits for smaller antennas are also discussed. Examples of high-impedance antenna designs we have worked on to achieve high

rectification efficiency will be described. As examples for rectenna applications, prototype rectennas in the microwave to millimeter-wave bands will be shown.

Aperture antennas for high beam efficiency
Ricardo A. M. Pereira, University of Aveiro, Portugal

Abstract - To increase the beam efficiency of radiative wireless power transfer systems, focusing components can be implemented. We will discuss techniques for designing, studying, simulating and manufacturing large aperture antennas, mainly reflectors and dielectric lenses, with the goal of achieving high total beam efficiency in radiative WPT scenarios. The first topic of this course is understanding what it means for a component to have a certain focal length, and how the different mathematical solutions for such components provide different devices with varying properties. Then, components will be designed and analyzed through full-wave simulation. Finally, their antenna feeds is an equally important aspect which will also be covered.

Array Synthesis Methods for Long-Range WPT - State-of-the-Art, Advances, and Future Challenges
Paolo Rocca, University of Trento, Italy

Abstract - The concept of long-range wireless power transmission (WPT) has been formulated shortly after the invention of high power microwave amplifiers. The promise of WPT, energy transfer over large distances without the need to deploy a wired electrical network, led to the development of landmark successful experiments, and provided the incentive for further research to increase the performances, efficiency, and robustness of these technological solutions. In this framework, the key-role and challenges in designing transmitting and receiving antenna arrays able to guarantee high-efficiency power transfer and cost-effective deployment for the WPT system has been soon acknowledged. Nevertheless, owing to its intrinsic complexity, the synthesis of WPT array antennas is still an open research field whose importance is growing as the possibility to transfer energy by means of electromagnetic waves gathers more and more interest from the application viewpoint.
This lecture is aimed at reviewing the topic of array design for long-range wireless power transmission, highlighting the latest advances and innovative solutions as well as envisaging possible future trends of the research in this area.

Speaker's Bio:

Keisuke Noguchi received the B.E. degree in electrical engineering from the Kanazawa Institute of Technology, Ishikawa, Japan, in 1990, the M.E. degree in electrical engineering from Tohoku University, Sendai, Japan, in 1992, and the Dr. Eng. degree in electrical engineering from the Kanazawa Institute of Technology, in 1998. From 1992 to 1995, he was at the Central Research Laboratory, Hitachi, Ltd. Since 1995, he has been with the Department of Electrical and Electronic Engineering, Kanazawa Institute of Technology, where he is currently a professor. From 2009 to 2010, he was a Visiting Scholar at the University of California, Los Angeles (UCLA), CA, USA. His research interests include antennas and propagation for mobile communication applications and wireless power transfer systems. Dr. Noguchi is a reviewer of the IEEE Transactions on Antennas and Propagation and the Institute of Electrical, Information, and Communication Engineers (IEICE) of Japan.

Ricardo A. M. Pereira was born in 1993 in Coimbra, Portugal. There, he graduated from the Integrated master's in physics engineering degree from the University of Coimbra (UC) and worked as a researcher on the topics of simulation, modelling and control, as well as metamaterials.

Graduating at the University of Aveiro, he studied how to increase the beam efficiency of radiative wireless power transfer (WPT) systems by using quasioptics for focusing microwave beams, being awarded the IEEE Wireless Power Transfer Conference Best Student Paper Award in 2022, the URSI GASS 2023 Young Scientist award. Additionally, he worked at University of Bologna after being attributed the European Microwave Internship Award 2022. He was also part of the team winning the first place in the Portuguese military innovation award, "Prémio de Inovação nas Forças Armadas 2023" for the project "S. C. O. U. T. E." (Sistema de Conexão e Otimização de Uniformes para Transferência de Energia).

He proposed the "Energy Mules" project, a solar power satellite system with energy storage, capable of supplying energy to the dark side of the moon. This concept won the 1st place in the 2022 International Solar Power Satellite Student Competition, organized by Space Canada, as well as funding by an ESA Call for Ideas. Another original proposal was that of the "Wireless Powered Flight" project, which consists in a WPT demonstrator by powering a drone. This won the "Outstanding Award" at 2024 IEEE WPTCE Student Design Competition and was selected to participate in the 2024 Prototypes for Humanity exhibition.

He is a volunteer at the IEEE WPT Initiative, and was chair of the IEEE student branch chapter at University of Aveiro, transforming it into a MTT-s & AP-s joint chapter.

Paolo Rocca (IEEE Fellow 2023) received the MS degree in Telecommunications Engineering (summa cum laude) in 2005 and the PhD Degree in Information and Communication Technologies in 2008 from the University of Trento, Italy. He is currently Associate Professor at the Department of Civil, Environmental, and Mechanical Engineering (University of Trento), Huashan Scholar Chair Professor at the Xidian University, Xi'an, China, and a member of the ELEDIA Research Center. Moreover, he is Member of the Big Data and AI Working Group for the Committee on Engineering for Innovative Technologies (CEIT) of the World Federation of Engineering Organizations (WFEO). Prof. Rocca received the National Scientific Qualification for the position of Full Professor in Italy and France in April 2017 and January 2020, respectively.

Prof. Rocca has been a visiting Ph.D. student at the Pennsylvania State University (USA), at the University Mediterranea of Reggio Calabria (Italy), and a visiting researcher at the Laboratoire des Signaux et Syst mes (L2S@ Sup lec, France) in 2012 and 2013. Moreover, he has been an Invited Professor at the University of Paris Sud (France) in 2015 and at the University of Rennes 1 (France) in 2017. Prof. Rocca has been awarded from the IEEE Geoscience and Remote Sensing Society and the Italy Section with the best PhD thesis award IEEE-GRS Central Italy Chapter.

His main interests are in the framework of computational electromagnetics with focus on antenna array synthesis and analysis, electromagnetic inverse scattering, and artificial intelligence techniques and quantum computing methods as applied to electromagnetics. Prof. Rocca published 6 book chapters, more than 500 scientific publications among which more than 180 on international journals and more than 320 in national and international conferences where he presented more than 50 invited contributions. He has organized more than 35 scientific sessions in international conferences and has participated to several technological projects in the International and European framework as well as at the national and local level with national agencies.

He served as an Associate Editor of the IEEE Antennas and Wireless Propagation Letters (2011-2016), the Microwave and Optical Technology Letters (2019-2020) and serves as an Associate Editor of the IEEE Antennas and Propagation Magazine (since 2020), and of Engineering (since 2020).

WORKSHOPS

WS1: Innovations in Wireless Power: Beamforming, On-Demand Energy, and Sustainable RF Harvesting

TUESDAY JUNE 3, 2025
Sala del Chiostro , 09:00-12:30

Organizer: **Jasmin Grosinger**, Graz University of Technology, Austria
Speakers: **Ifana Mahbub**, The University of Texas at Dallas, USA
Nuno Borges Carvalho, Universidade de Aveiro, Portugal
Mahmoud Wagih, University of Glasgow, Scotland
Jasmin Grosinger, Graz University of Technology, Austria

Summary: This workshop gathers leading experts to explore state-of-the-art advancements and practical challenges in long-range radiative wireless power systems. The session will cover a broad spectrum of topics, including advanced beamforming techniques, energy delivery for remote and mobile applications, real-world RF powering and sensing, and sustainable RF energy harvesting at the chip level.
The workshop begins with a deep dive into emerging technologies for long-range microwave-based power beaming. Here, innovative approaches using beamforming for both transmitter and receiver design are presented to mitigate propagation losses and enhance power transfer efficiency, particularly in the radiative near-field region.
Building on this foundation, the discussion advances to novel "energy on demand" concepts, examining how long-range wireless power transfer links can efficiently deliver energy from satellites to UAVs—and even to lunar infrastructures. This segment highlights methods for optimizing beamforming and energy focus across diverse frequency bands, ranging from 5.8 GHz to 26 GHz.
The third segment brings practical insights into deploying RF power transfer and sensing in real-world scenarios. It addresses the challenges posed by multipath effects, transmitter configurations, and regulatory constraints in sub-6 GHz applications, illustrating how these factors influence link performance and sensor data reliability.
Concluding the workshop, the focus shifts to RF energy harvesting and chip-level impedance matching. This presentation reviews the design of integrated CMOS-based energy harvesters, emphasizing the critical role of power matching between antenna and chip in achieving ultra-low-power, batteryless wireless nodes for sustainable digital infrastructure.
By integrating theoretical innovations with practical insights, this workshop aims to inspire novel solutions and foster interdisciplinary collaboration in the rapidly evolving field of wireless power.

List of Presentations

Emerging Technologies for Long-Range Microwave-Based Power Beaming
Ifana Mahbub (The University of Texas at Dallas, USA)
Abstract: Wireless power beaming (WPB) is a revolutionary direction in the development of the next generation of far-field wireless power transfer (WPT) networks since this approach yields increased range, enhanced signal gain, and increased power transfer efficiency. This tutorial discusses methods to increase efficiency in a WPB system that can be achieved by decreasing the loss occurring due to the propagation or the path loss, misalignment, and signal phase incoherence. A WPB system requires precise directive radiation beam which can be achieved using beamforming. This tutorial discusses the transmitter (TX) and receiver (RX) antennas to achieve such directive radiation beam using beamforming while achieving a high gain and radiation efficiency. Antennas/metasurfaces with array elements are used for beamforming where the phase

and amplitude along the array elements are adjusted to achieve a narrow directive beam as well as beam steering. The RX size and placement is determined strategically based on the TX beamforming performance and the RX distance from TX to improve the efficiency by achieving higher beam collection. The received power at the RX is harvested using a highly efficient rectifier-based energy harvesting circuit. The tutorial includes methods to improve the efficiency and range of WPB systems having single TX-RX structure along with a distributed WPB systems.

E-Mules - Energy on Demand, from Satellite to UAV WPT Links
Nuno Borges Carvalho (Universidade de Aveiro, Portugal):
Abstract: In this talk, I will explore the application of long-range Wireless Power Transfer (WPT) for delivering energy to remote stations on the Moon and Internet of Things (IoT) sensors on Earth. The focus will be on leveraging WPT technologies to enable efficient and reliable energy delivery in environments where conventional power sources are unavailable or impractical. The operational frequency range considered spans from 5.8 GHz to 26 GHz, addressing the technical challenges and opportunities presented at these frequencies. Additionally, the discussion will include strategies for optimizing energy focus and beamforming to ensure maximum power efficiency and minimal losses during transmission. These advancements in WPT hold significant potential for supporting sustainable lunar infrastructure and enhancing the deployment of IoT networks on Earth.

Robust and Sustainable RF Wireless Power and Sensing: Lessons Learnt from Practical Deployment
Mahmoud Wagih (University of Glasgow, Scotland):
Abstract: While RF power transfer's main application is sensing, rectennas are typically evaluated solely based on the received power levels in controlled environments. This talk will discuss how sub-6 GHz RF power transfer and RFID sensing could be deployed in practical environments, assessing the power conversion efficiency and link performance through the reliability and frequency of the collected sensor data. The effects of multi-path, transmitter arrangements, and regulations, on creating reliable wireless-powered networks will be discussed. Finally, new research prototypes with >30 m safe wireless powering and sensing range will be introduced, in the 5.6 GHz band.

Optimizing RF Energy Harvesting: Chip Impedance Measurement for Efficient Power Matching
Jasmin Grosinger (Graz University of Technology)
Abstract: In our rapidly digitalizing world, the explosive growth in the number of wireless nodes poses significant environmental and economic challenges due to reliance on batteries. RF energy harvesting emerges as a sustainable solution by enabling batteryless operation, leveraging integrated CMOS-based systems in the sub-1 GHz ISM bands. This talk delves into the critical aspect of power matching—ensuring that the antenna and the RF energy harvester chip exhibit complex conjugate impedance. We discuss the limitations of both on-chip and off-chip matching networks, and outline practical methods for precise chip impedance measurement. By reviewing recent advances in integrated RF energy harvester designs and demonstrating effective measurement setups, this presentation provides valuable insights into optimizing power conversion efficiency and fostering the development of sustainable wireless power infrastructures.

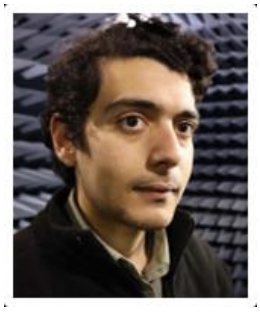
Organizers' and Speakers' Bio:

Ifana Mahbub is an Associate Professor and the Texas Instrument's Early Career Chair Awardee in the Department of Electrical and Computer Engineering at the University of Texas at Dallas, where she is leading the Integrated Biomedical, RF Circuits and Systems Laboratory (iBioRFCASL). Her research interests include wireless power transfer for various implantable and wearable sensors, as well as UAVs and IoT devices. She received a B.Sc. degree (2012) in Electrical and Electronic Engineering from the Bangladesh University of Engineering and Technology, and a Ph.D. degree (2017) in Electrical Engineering from the University of Tennessee,

Knoxville. Dr. Mahbub is the recipient of the NSF "Early Career Award" (2020), and the DARPA "Young Faculty Award" (2021), and the DARPA Director's Fellowship (2023). She serves as the vice-chair for the USNC-URSI commission K, and as an Associate Editor for the IEEE Transactions of Antennas and Propagation. She is also serving as a full member for the IEEE MTT-S Technical Committee 25 (Wireless Power Transfer and Energy Conversion) and the IEEE APS Technical Committee on Health and Medicine.

Nuno Borges Carvalho was born in Luanda, Angola, in 1972. He received his Diploma and Doctoral degrees in electronics and telecommunications engineering from the University of Aveiro, Aveiro, Portugal, in 1995 and 2000, respectively. He is currently a Full Professor and a Senior Research Scientist with the Institute of Telecommunications, University of Aveiro, the director of the Department of Electronics, Telecommunications and Informatics at UA, and an IEEE Fellow. He coauthored Intermodulation in Microwave and Wireless Circuits (Artech House, 2003), Microwave and Wireless Measurement Techniques (Cambridge University Press, 2013), White Space Communication Technologies (Cambridge University Press, 2014) and Wireless Power Transmission for Sustainable Electronics (Wiley, 2020). He has been a reviewer and author of over 400 papers in magazines and conferences. He is the Editor in Chief of the Cambridge Wireless Power Transfer Journal, an associate editor of the IEEE Microwave Magazine, and former associate editor of the IEEE Transactions on Microwave Theory and Techniques and IET Microwaves Antennas and Propagation Journal. He is the co-inventor of six patents. His main research interests include software-defined radio front-ends, backscatter communications, wireless power transmission, nonlinear distortion analysis, and measurements in microwave/wireless circuits and systems. He has been involved in the design of dedicated radios and systems for newly emerging wireless technologies.

Dr. Borges Carvalho is a member of the IEEE MTT ADCOM, the past chair of the IEEE Portuguese Section, TC-20 and TC-11, and also belongs to the technical committees, TC-25 and TC-26. He is also the Chair of the URSI Commission A (Metrology Group). He was the recipient of the 1995 University of Aveiro and the Portuguese Engineering Association Prize for the best 1995 student at the University of Aveiro, the 1998 Student Paper Competition (Third Place) of the IEEE Microwave Theory and Techniques Society (IEEE MTT-S) International Microwave Symposium (IMS), and the 2000 IEE Measurement Prize. He is a Distinguished Lecturer for the RFID Council and was a previous Distinguished Microwave Lecturer for the IEEE Microwave Theory and Techniques Society. In 2023, he was the IEEE MTT-S President.



Mahmoud Wagih received his B.Eng. (Hons.) in September 2018, and his award-winning Ph.D. on rectenna design in April 2021, both in Electrical and Electronic Engineering from the University of Southampton. He is currently at the University of Glasgow leading the Green RF-Enabled Electronics Lab, having held a UKIC Fellowship from the Royal Academy of Engineering. His interests broadly cover antennas and RF-enabled sustainable systems for energy harvesting, sensing, and wearable applications. He has published 120 journal and conference publications and 2 patents, and has been principal/co-investigator on over £9M research projects. Dr. Wagih is a Senior Member of the International Union of Radio Science (URSI). He is a Member of and a Speakers' Bureau speaker for the IEEE Microwave Theory & Techniques Technical Committees TC-26, RFID, IoT, and Wireless Sensors. He received 20+ awards including multiple IEEE Best Paper/Presentation (IMS, WPTC, PowerMEMSx2), the EurAAP Per-Simon Kildal Best PhD in Europe in Antennas and Propagation, 2 URSI Young Scientist Award and was listed in Forbes 30 Under 30. He has served on multiple TPCs, e.g., TPC Co-chair for IEEE SAS 2025, and member of IMS TPC. He is a Topic Editor for the IEEE Journal of Microwaves, and an Associate Editor for Royal Society Open Science.

Jasmin Grosinger is an Associate Professor at the Institute of Microwave and Photonic Engineering at Graz University of Technology in Austria, where her research focuses on sustainable wireless electronics and systems. She also holds a position as a Visiting Associate Professor at the Graduate School of Engineering at Tohoku University, Japan. A Senior Member of IEEE, Jasmin has co-authored numerous peer-reviewed publications, book chapters, and invention disclosures. For her PhD work, she received the first prize from the Industrial Union of the Austrian Automotive Industry's Jubilee Foundation. In 2021, she was honored with the Mind the Gap—Diversity Award from Graz University of Technology. From 2019 to 2024, she served as Associate Editor for IEEE Microwave and Technology Letters, and is currently the inaugural Editor-in-Chief of the IEEE Journal on Wireless Power Technologies. Jasmin is an active member of the IEEE Microwave Theory and Technology Society (MTT-S), where she contributes to Technical Committees 25 (Wireless Power Transfer and Energy Conversion) and 26 (RFID, Wireless Sensors, and IoT). Recognized as a Distinguished Microwave Lecturer by MTT-S, she is also an Elected Voting Member of its Administrative Committee, chairing the Meetings and Symposia Committee since 2024.

WS2: Wireless Power Transfer (WPT) Systems and Implantable Cardiac Stimulators: Regulatory Framework and Practical Risk Evaluation of Electromagnetic Interference (EMI)

TUESDAY JUNE 3, 2025
Aula 8 , 09:00-12:30

Organizers: **Cecilia Vivarelli**, Italian National Institute of Health, Rome, Italy
Eugenio Mattei, Italian National Institute of Health, Rome, Italy
Speakers: **Gian Marco Contessa**, Italian National Institute of Health, Rome, Italy
Giovanni Calcagnini, Italian National Institute of Health, Rome, Italy
Aldo Canova , Politecnico di Torino, Turin , Italy
Cecilia Vivarelli , Italian National Institute of Health, Rome, Italy
Stefano Accinelli , *Fellow Technical Services*, Boston Scientific, Rhythm CARE

Summary: The rapid advancement of Wireless Power Transfer (WPT) systems is revolutionizing various sectors, including healthcare and biomedical applications. However, these technologies pose significant safety challenges, particularly for individuals with implantable medical devices such as pacemakers and cardiac defibrillators. A critical issue is the evaluation and management of Electromagnetic Interference (EMI), which could potentially disrupt the functionality of these devices.
This workshop aims to provide a comprehensive overview of the regulatory framework and practical approaches to addressing safety concerns associated with WPT systems in the context of implantable cardiac stimulators. International standards (e.g., IEC 60601-1, ISO 14708) and European guidelines will be discussed, highlighting their implications for engineers, designers, and regulatory bodies.
Specific focus will be placed on the challenges faced by WPT systems in the automotive sector, where the typical power levels are quite high and are expected to be widely adopted and implemented in many public areas and workplaces in the near future.
The workshop will also explore case studies and methodologies for effective risk assessment, taking into account critical parameters such as operating frequency, transmitted power, and separation distance between the WPT source and the medical device. Through an interdisciplinary approach involving biomedical

engineering, electromagnetics, and regulatory sciences, participants will gain insights into designing safe and compliant WPT systems while safeguarding public health and occupational safety.
This event is designed for professionals, researchers, and policymakers interested in understanding and managing the interactions between WPT systems and implantable medical devices, with an emphasis on real-world applications and risk mitigation strategies for workers.

List of Presentations

Protection against acute health effects: scientific basis of international guidelines
Gian Marco Contessa (National Centre Radiation protection and computational physics, Italian National Institute of Health, Rome, Italy)
Abstract: The presentation provides an overview of the protection guidelines against acute health effects caused by electric, magnetic, and electromagnetic fields, based on international recommendations from ICNIRP (International Commission on Non-Ionizing Radiation Protection). The commission's primary objectives include assessing health risks associated with non-ionizing radiation (NIR), establishing international exposure limits, and providing recommendations for protection. ICNIRP guidelines are widely recognized and adopted in the European Union through legal frameworks such as the 1999/519/EC Council Recommendation for public protection and the 2013/35/EU Directive for occupational exposure. The presentation details the scientific foundations of these guidelines, emphasizing the distinction between direct and indirect effects of exposure. Direct effects include low-frequency electric and magnetic field interactions, nerve and muscle stimulation, and tissue heating due to electromagnetic energy absorption. Indirect effects involve contact currents and electromagnetic interference with medical implants. Exposure limits are categorized into two levels: a higher threshold for occupational settings and a more restrictive threshold for the general public, incorporating safety factors to prevent adverse health effects. The 2020 ICNIRP updates introduced new dosimetric parameters, particularly for high-frequency exposures linked to technologies like 5G. Future updates to European legislation aim to incorporate the latest scientific evidence from ICNIRP.

The EMC of cardiac implantable devices: the regulatory framework
Giovanni Calcagnini (Department of Cardiovascular, Endocrine-metabolic Diseases and Aging, Italian National Institute of Health, Rome, Italy)
Abstract: In this talk, I will explore the application of long-range Wireless Power Transfer (WPT) for delivering energy to remote stations on the Moon and Internet of Things (IoT) sensors on Earth. The focus will be on leveraging WPT technologies to enable efficient and reliable energy delivery in environments where conventional power sources are unavailable or impractical. The operational frequency range considered spans from 5.8 GHz to 26 GHz, addressing the technical challenges and opportunities presented at these frequencies. Additionally, the discussion will include strategies for optimizing energy focus and beamforming to ensure maximum power efficiency and minimal losses during transmission. These advancements in WPT hold significant potential for supporting sustainable lunar infrastructure and enhancing the deployment of IoT networks on Earth.

Wireless Power Transfer for automotive: basics of operations and EMF exposure characterization
Aldo Canova (Energy Department "Galileo Ferraris", Politecnico di Torino)
Abstract: Wireless power transfer (WPT) in automotive applications is an emerging technology that, like any source of electromagnetic fields, has the potential to interfere with other electronic devices, potentially affecting their proper functioning. This risk requires careful evaluation, especially when the affected device is a cardiac implantable electronic device (CIED), as any malfunction could pose serious hazards to patient safety.
Currently, WPT technology is still in its early stages and has not been explicitly considered in the development of existing CIED regulations. As a result, predicting how a CIED will behave when in proximity to a WPT system is not straightforward.

In this talk, the basic principles of WPT systems for automotive applications will be described. This will be followed by an evaluation of the typical exposure conditions generated by these systems, with the aim of determining whether they could pose risks to patients with a pacemaker or an implantable cardioverter-defibrillator.

Experimental assessment of the potential EMI form WPT systems and cardiac implantable stimulators
Cecilia Vivarelli (National Centre for Innovative technologies in public health, Italian National Institute of Health, Rome, Italy)
Abstract: WPT systems emit both conducted and radiated emissions and can generate strong leakage electromagnetic fields, which may present significant challenges in terms of electromagnetic compatibility (EMC) and human exposure. Studies have shown that ICNIRP limits set for the general public can be exceeded in certain positions relative to the charger and/or the human body, potentially posing a risk for patients with pacemakers (PMs) or implantable cardioverterdefibrillators (ICDs) due to possible electromagnetic interference (EMI) events. In this talk, the results of provocative in-vitro tests will be presented. These tests were conducted using a phantom equipped with implants from a representative sample of cardiac implantable electronic devices (CIEDs), specifically PMs and ICDs. The devices were exposed to an electromagnetic field generated by a magnetic field generation system operating at the frequency used by WPT systems under worst-case exposure conditions, with field levels reaching up to ICNIRP occupational reference levels.

WPT and cardiac implantable stimulators: The companies' perspective
Stefano Accinelli (Fellow Technical Services, Boston Scientific, Rhythm CARE)
Abstract: Companies that manufacture and market implantable cardiac stimulators have always invested resources and implemented protective mechanisms within their devices to minimize EMI phenomena in public, domestic, and workplace environments. However, whenever a new technology that relies on electromagnetic fields for its operation becomes widely and pervasively integrated into our living spaces, it is essential to assess whether these protective measures remain adequate to ensure patient safety or if updates and improvements are necessary.
In this talk, the activities carried out by Boston Scientific in evaluating potential interference events induced by WPT systems for automotive applications will be described.

Organizer and Speaker's Bio:

Gian Marco Contessa is a Senior Research Scientist at the Italian National Institute of Health (ISS), where he conducts research on protection from ionizing and non-ionizing radiation and is a member of the Collaborative Centre of the World Health Organization (WHO). From 2012 to 2023, he was a Researcher at the Italian National Agency for New Technologies, Energy, and Sustainable Economic Development (ENEA), also serving as a Radiation Protection Expert for the research centers of Casaccia and Frascati. Since 2020, he has been Task Leader of the Radiation Protection team in the ENEA Sorgentina-RF project, focusing on the production of medical radioisotopes using fusion neutrons. Dr. Contessa holds a degree in Physics, a PhD in Biochemistry and Molecular Biology, and is a Medical Physics Expert. With 20 years of experience in occupational safety, medical physics, and radiation protection, he has worked for organizations including ISPESL (now INAIL), ASL Roma “C”, Sapienza University’s Department of Human Neurosciences, and San Pietro Fatebenefratelli Hospital. He currently serves as a Member of the Board of Directors of the Interregional Order of Chemists and Physicists (LUAM), the Italian Association of Radiation Protection (AIRP), and the Italian Federation for Radiation Research (FIRR). Additionally, he is an Adjunct Professor of Applied Physics at Sapienza University and Unicamillus University in Rome. Dr. Contessa is the author of over 170 scientific and technical papers on medical physics and radiation protection, published in national and international journals

Giovanni Calcagnini received the M.S. degree in Electronic Engineering in 1993, from the University of Rome, and the Ph.D. degree in Biomedical Engineering from the University of Bologna, in 1997. He is research director at the Department of Cardiovascular, Endocrinemetabolic Diseases and Aging of the Italian National Institute of Health, Rome. His researches and interests are in the area of cardiovascular signal processing, cardiovascular medical devices and electromagnetic compatibility. In these filed he has co-authored more than 180 conference and journal papers in these fields and and serves as referee of many international journals. Since 2008 he has been member of the CENELEC Committee TC-106x dealing with human exposure to electromagnetic fields.

Aldo Canova was born in Biella, Italy, in 1967. He received the Laurea and Ph.D. degrees in electrical engineering from the Politecnico di Torino, Turin, Italy, in 1992 and 1996, respectively. In 1995, he became Researcher, then in 2003 Associate Professor and finally in 2017 Full Professor with the Energy Department "Galileo Ferraris" of Politecnico di Torino. He has authored/coauthored about 180 scientific publications in international conference proceedings and international journals and invented 8 patents. He is involved in research activities related to the numerical computation of electromagnetic fields in the area of power devices and magnetic shielding, energy system modelling and optimisation and nondestructive testing. He has been a Member of the Comitato Elettrotecnico Nazionale (CEI) serving on Technical Committee CT106 (methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure), since 2004. He is also actually General Secretary of the Italian National Association of non Destructive Testing.

Cecilia Vivarelli received the M.S. degree in Medical Engineering in 2020, from the University of Rome “Tor Vergata”, and she is attending the Ph.D. degree in Computer Science, Control and Geoinformation at the University of Rome “Tor Vergata”. Her Ph.D. project is on the risk assessment of workers with active implantable medical devices exposed to electromagnetic fields. In 2023 she became a researcher at the Department of Cardiovascular, Endocrinemetabolic Diseases and Aging, Italian National Institute of Health, Rome. In December 2024 she joined the National Centre for Innovative technologies in public health, Italian National Institute of Health, Rome. Her current research interests include the electromagnetic compatibility of medical devices, numerical modeling of RF sources, and cardiovascular signal processing.

Eugenio Mattei obtained his M.S. degree in Medical Engineering in 2005 from the University of Rome "Tor Vergata" and earned his Ph.D. in Biomedical Engineering from the University of Bologna in 2008. Since 2009, he has been a researcher at the Department of Cardiovascular, Endocrine-Metabolic Diseases, and Aging at the Italian National Institute of Health in Rome. During 2006 and 2007, he served as a research fellow at the Center for Devices and Radiological Health of the Food and Drug Administration in Washington, USA. Since 2022, he has been a member of the technical committee UNI/ISO/TC 150 - Implants for Surgery. His research interests encompass various areas of biomedical engineering, including electromagnetic compatibility of medical devices, numerical modeling of RF sources, signal processing of cardiovascular signals, development of experimental setups for biomedical signal acquisition, body-worn sensors, and analysis of medical device compliance with EU and international regulations.

Stefano Accinelli is a Fellow Technical Consultant in the Cardiac Rhythm Management Division of Boston Scientific. He was born in Genova in 1968 and started his professional experience as electronic engineer in the Microelectronics Technology Lab in Marconi Italiana supporting Military and Telecommunication projects applications. In 1991 he joined Hewlett Packard Medical Division as field support engineer providing technical and clinical support for Cardiac Diagnostic Equipment like Echocardiography, Electrocardiography, external cardiac defibrillator and patient monitoring systems. He became European clinical application specialist for patient Anesthesia Monitoring System and patient multiparametric vital data acquisitions monitoring in Philips Medical System developing deep knowledge in Cardiac Arrhythmia Central Stations and Cat Lab systems. In 2002 he joined Guidant Clinical Research Department as Field Clinical Research Engineer providing technical and clinical support during implantation and follow-up for cardiac pacemaker, defibrillator and systems for cardiac resynchronization therapy. He was supporting pre and post market clinical investigational studies for implantable devices while working in Guidant Clinical Research Department in Brussels until 2005 when he moved to the CRM Technical Service Department in Boston Scientific. He currently serves as a Fellow Technical Consultant CRM in the RhythmCARE department supporting the EMEA regions and since 2009 he is cooperating with CRM R&D department regarding EMC compliance supporting implanted devices evaluation requests from the field in relationship to the EN 50527 worker safety standards and also through industry collaboration in development of the EMC test requirements in the IS0 14117 standard.

WS3: Wireless Power Transfer for Electrification

TUESDAY JUNE 3, 2025
Sala del Chiostro, 13:30-17:00

Organizers: **Leonardo Sandrolini**, University of Bologna, Italy
Silvano Cruciani, Tor Vergata University of Rome, Italy
Speakers: **Christian Koebel**, ENRX Group AS, Norway
Davide Chiola, Movyon Spa, Italy
Nicolas Hautière, Université Gustave Eiffel, Paris, France
Dionysios Aliprantis, Purdue University, USA

Summary: This workshop will explore recent advancements, challenges, and future directions in wireless power transfer (WPT) for transportation.
Experts will discuss the current status and future potential of high-power inductive charging systems, the integration of WPT into road infrastructure, and the technical and regulatory challenges associated with dynamic WPT.
The session will provide a comprehensive overview of the role of WPT in enabling sustainable and efficient electrified transportation systems.

List of Presentations

High power inductive charging systems for heavy duty applications - status quo and next steps
Christian Koebel (ENRX Group AS, Norway)
Abstract: Wireless power transfer is a stablished technology in many applications across the industry. Cross belt sorter or AGVs using wireless power transfer with lower power since more than 20 years and the technology is widely accepted. On the other side, high power wireless power charging has been started in 2002 with the first electric bus being charged by a 30-kW charging system. Since then, many systems have been developed with 200 kW for a single unit and up to 500 kW with multiple coils. And although the

standardisation activities are ongoing since many years, no standard for high power and heavy-duty applications has been realized up to now.
The SAE J2954/2 and -/3 activities are now focusing on defining the standard for high power static charging (-/2) and for high power dynamic charging (-/3). Many suppliers are working together to define the standard and the interoperability between the different topologies like multiphase systems and single coils. The status quo of interoperability and the road to an aligned standard will be presented.

Engineered Synergies: Enhancing Maintainability and Durability in Pavement-Integrated DWPT Systems
Davide Chiola (Movyon Spa, Italy)
Abstract: Dynamic Wireless Power Transfer (DWPT) technology has emerged as a promising solution to support the widespread adoption of electric vehicles (EVs) by enabling continuous charging while in motion. However, the integration of inductive charging coils within road pavements introduces significant challenges in terms of maintainability and durability. A fundamental challenge in DWPT deployment is maintaining the structural integrity and functional efficiency of both the pavement and the inductive charging system over time. Traditional road pavements are designed for predictable mechanical and environmental stresses, while DWPT infrastructure introduces additional constraints, such as electromagnetic compatibility, thermal effects, and accessibility for maintenance. The combined system must not only withstand dynamic traffic loads but also facilitate interventions to repair or upgrade the embedded technology without compromising the pavement's structural performance. To address these challenges, innovative engineering solutions are required at multiple levels. At the material level, novel asphalt and concrete formulations with enhanced mechanical and thermal properties are being developed to accommodate the presence of charging coils while ensuring road durability. Structural design optimizations, such as modular pavement systems, prefabricated inductive charging segments, and easily replaceable coil enclosures, are being explored to enhance maintainability. Ultimately, the success of DWPT technology depends on the ability to integrate robust engineering solutions that balance charging efficiency with long-term maintainability. By addressing these challenges, the development of resilient and serviceable DWPT infrastructure can accelerate the transition to sustainable electric mobility while ensuring the reliability of transportation networks.

Will Dynamic Wireless Power Transfer be able to meet the requirements of the French Grand Challenge Roadmap on Electric Road Systems?
Nicolas Hautière (Université Gustave Eiffel, Paris, France)
Abstract: The French Ministry of Transport has published an ambitious roadmap in 2021 that focuses on the large-scale deployment of electric road systems. This roadmap involves selecting an ERS technology and deploying it on major motorway corridors by 2035. In order to cover 90% of the national territory, the envisaged technology should be capable of charging heavy vehicles at 350 kW on 90% of the network, with a range of 250 km outside the ERS corridor. The aim of this presentation is to discuss the ability of DWPT technology to meet these requirements, to present the demonstration projects that have been selected to meet France's grand challenge, and to discuss the R&D prospects that have already been identified to bridge the gaps between wish and reality.

Electrified Roadways with Dynamic Wireless Power Transfer
Dionysios Aliprantis (Purdue University, USA)
Abstract: Among the various technology options currently under consideration for transportation electrification, dynamic wireless power transfer (DWPT) is emerging as a compelling alternative, which can be thought to be complementary to stationary charging. DWPT can decrease range anxiety and, with widespread implementation of DWPT roadways, may ultimately lead to EVs with reduced battery capacity and vehicle cost. DWPT also promises to eliminate spatial and temporal charging constraints, and will alleviate the development of long queues at stationary charging stations. For economic reasons, it is likely that DWPT roadways will be instantiated in corridors with substantial traffic volumes. Hence, it is important to develop DWPT systems that can provide power to propel heavy-duty vehicles (HDVs) moving at highway speeds, which requires approximately 100–150 kW per HDV on average. DWPT roadways consist of sequential ground assemblies with transmitter coils buried several cm below the pavement surface. DWPT

technology can be significantly more "grid-friendly" compared to stationary depot charging stations. This is because stationary charging leads to prolonged, concentrated, and high loads (that could reach tens of MW) on the distribution grid; whereas the load from the DWPT charging infrastructure would be spatially distributed across multiple substations (with peak loads estimated at approximately 5–10 MW per km). In this workshop presentation, we will showcase the technical details and present the development status of a first-of-its-kind high-power DWPT pilot project in West Lafayette, Indiana, USA. This project is sponsored by the Indiana Department of Transportation and is a close collaboration between academia (Purdue University) and industry partners (White Construction, Cummins, AECOM, PC Krause and Associates). The project is affiliated with the ASPIRE NSF Engineering Research Center. Apart from technical aspects, we will also discuss the financial feasibility of DWPT technology.

Organizer and Speaker's Bio:

Christian Köbel is Director Technology at ENRX Group, a global leader in induction technology. He oversees the development and strategy of ENRX's Charge product line, driving cutting-edge innovations in inductive charging and power transfer solutions. Christian joined ENRX following the acquisition of IPT Technology, where he served as Chief Technology Officer.

With over 20 years of experience in electrical engineering, product development, and strategic leadership, Christian has been at the forefront of advancing sustainable technologies. His career began at Bombardier Switzerland in 2000, where he held key roles, including Director R&D Programme Management. In this role, he led the development of the ECO4 portfolio, introducing energy-efficient solutions across divisions. At Primove Technology, he drove the adoption of wireless charging systems as Director Technology and later as Managing Director of Bombardier Primove GmbH, where he shaped strategy, business growth, and global market expansion.

Christian holds a degree in Electrical Engineering and International Project Engineering from the University of Applied Sciences in Konstanz, Germany, and a Bachelor of Business Administration from GSBA Zurich. His international perspective is further enriched by academic experience at the University of Cape Town, South Africa.

At ENRX, Christian continues to push the boundaries of technology in the Charge division, delivering innovative solutions that shape the future of e-mobility and industrial applications. His deep expertise in R&D and business strategy positions him as a driving force behind sustainable, energy-efficient technologies.

Davide Chiola is a civil engineer with a specialization in transportation infrastructure. He currently serves as the Smart Infrastructure R&D Coordinator at Movyon S.p.A., where he leads innovative research and development projects focused on infrastructure monitoring and management. Prior to this role, he was an R&D Specialist at the same company, where he concentrated on pavements and materials. Additionally, Davide worked as a Pavement and Signage Coordinator at Autostrade per l'Italia, where he was responsible for managing maintenance plans and overseeing construction projects.

Nicolas Hautière, Ing. PhD Habil., is Ingénieur en Chef des Ponts, des Eaux et des Forêts at the Université Gustave Eiffel. After ten years of research experience in computer vision applied to cooperative ITS, automated vehicles and opportunistic meteorological observation, he used to lead the “Route 5e Génération (R5G)” Program from 2014 to 2021. Since 2022, he acts as Director of the Components and Systems Department (COSYS) of Université Gustave Eiffel. In the field of Electric Road Systems (ERS), he took part in the French ministry of Transport report on ERS, co-leading WG3. He helped set up the FABRIC (2014-2018) and INCIT-EV (2020-2024) EU projects. He represents Univ Eiffel at the steering committees of eRoadMontBlanc and Charge As You Drive France 2030 pilot projects.

Dionysios Aliprantis is a Professor of Electrical and Computer Engineering (ECE) at Purdue University, West Lafayette, Indiana, USA. Dionysios obtained his PhD from Purdue University in 2003, and his Diploma in ECE from the National Technical University of Athens, Greece, in 1999. Prior to joining Purdue, he was an Assistant Professor of ECE at Iowa State University. His research interests include electromechanical energy conversion and electric machinery, power electronics, and power systems analysis. He is an IEEE Fellow and is currently serving as the Editor-in-Chief of the *IEEE Transactions on Energy Conversion*.

Leonardo Sandrolini received the Laurea degree (Hons.) in Electrical Engineering in 1995 and the Ph.D. degree in Electrical Engineering in 2000, both from the Alma Mater Studiorum – Università di Bologna, Bologna, Italy. Since 2001, he is with the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" (DEI) of the same University, where is currently an Associate Professor teaching courses of Electrotechnics, Electromagnetic Compatibility and Applied Electromagnetism. His research interests are in the areas of electromagnetic field theory, electromagnetic compatibility, electrical characterisation of renewable energy sources and wireless power transfer with resonant inductive coupling. He is the author of about 130 papers published in peer-reviewed international journals and conferences. He is the Scientific Coordinator of the Laboratory of Electromagnetic Compatibility (LACEM) of the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi", Alma Mater Studiorum – Università di Bologna. He is an Associate editor for the Wiley journals International Journal of Photoenergy and International Journal of RF and Microwave Computer-Aided Engineering; for the MDPI Journal Electronics; he is a Member of the Advisory Board of the Elsevier International Journal of Electrical Power & Energy Systems. Prof. Sandrolini is a Senior Member of the IEEE, the Secretary of the IEEE EMC Society SC1 “Smart Grids”, a Member of the IEEE EMC Society TC 7 “Electrical Systems and Power Electronics EMC” and of the IEEE MTT Society TC MTT-26 “Wireless Energy Transfer and Conversion”.

Silvano Cruciani received the Ph.D. degrees in Electrical Engineering from University of L'Aquila in 2015. He joined the Department of Industrial Engineering at the Tor Vergata University of Rome in 2022 where he is a currently an assistant professor. He has authored more than 100 papers in the field of wireless power transfer technology, computational electromagnetics, EMC, and EMF safety. He is a member of the IEEE Societies on Electromagnetic Compatibility, Power Electronics, and Circuits and Systems.

WS4: Fundamentals and Applications of Rydberg Atom-Based Electric Field Sensors

TUESDAY JUNE 3, 2025
Aula 8 , 13:30-17:00

Organizer: **Christopher L. Holloway**, NIST, USA
Speakers: **Christopher L. Holloway**, NIST, USA
Nik Prajapati, NIST, USA
Noah Schlossberger, CU/NIST, USA

Summary: The unique properties of Rydberg atoms allow for radio-frequency (RF) spectroscopy, which has resulted in intriguing applications. For example, Rydberg atom receivers allow for the detection and receiving of time-varying fields and communication signals without an antenna and front-end electronics. The idea in these Rydberg atom-based sensors is to replace conventional antennas (which rely on conduction electrons bound by the antenna geometry) with atom-sensors (glass cells filled with atomic vapor: atomic-bound electrons).
This workshop aims to familiarize the participants, who may have limited knowledge of atomic and quantum physics, with the concept of Rydberg atom-based sensors. The main objective of this workshop is to provide sufficient information to the attendees to comprehend the diverse capabilities of Rydberg atom sensors.
In the past few years, there has been a growing interest in the development of atomic-based quantum electric and magnetic field sensors. As a result, numerous companies and universities have initiated programs dedicated to the research and development of these quantum sensors. One of the keys to developing new science and technologies is to have sound metrology tools and techniques. Fundamental to all electromagnetic measurements is having accurately calibrated probes, antennas, and power meters to measure either electric (E) fields, magnetic (H) fields, and power. Atom-based measurements have played a crucial role in enabling direct traceable measurements within the International System of Units (SI). As a result, measurement standards have progressively embraced atom-based measurements in various domains including length (m), frequency (Hz), and time (s) standards. In the past 10 years, we have made great progress in the development of a fundamentally new, direct SI traceable approach to E-field measurement based on Rydberg atoms (traceable through Planck's constant, which is now an SI defined constant). The Rydberg atom-based sensors now have the capability of measuring amplitude, polarization, and phase of RF fields and signals. As such, various applications are beginning to emerge. These include SI-traceable E-field probes, power-sensors, voltage standards, thermometry (the measurement of temperature), RF cameras, receivers for communication signals (AM/FM modulated and digital phase modulation signals), TV/Video-Game streaming and many other applications. These novel sensors based on Rydberg atoms will prove advantageous for 6G and future generations as they enable the calibration of field strength and power for frequencies exceeding 100 GHz. The objective of this workshop is to emphasize the theoretical foundations and practical applications of atomic sensors for electric field measurements.

This workshop will provide comprehensive presentations on the technologies surrounding Rydberg atom-based sensors, accompanied by thorough discussions. This content will equip the participants with a foundation necessary to comprehend and acquaint themselves with the capabilities of these and related quantum sensors. While, the majority of the dissemination of quantum sensor research has primarily occurred within the physics community, this workshop will target the interests and expertise of the other communities. This community will benefit from a greater familiarity with these new types of sensors to meet measurement and application needs of the future. This workshop will give an overview and summarize this new technology in time-varying signal detection and discuss various applications and pathways to commercialization. The presenters at the workshop have been leading this field for the past 15 years and are recognized as the leading experts in quantum-based sensors.

List of Presentations

Overview of Rydberg Atom-Based E-Field Sensors
Chris Holloway (NIST)

SI-Traceable Rydberg Metrology for Fields and Power
Nik Prajapati (NIST):

Practical Experimental and Theoretical Considerations
Noah Schlossberger (CU/NIST)

Rydberg Receivers: Bandwidth and Sensitivity
Nik Prajapati (NIST)

Imaging: RF Cameras to Sub-wavelength measurements
Noah Schlossberger (NIST)

Organizer and Speaker's Bio:

Christopher L. Holloway is a NIST Fellow and a Fellow of the IEEE. He has been at NIST since 2000, where he works on electromagnetic theory, atomic physics, quantum optics, quantum-based sensors, and calibration standards. He has a publication h-index of 64 with over 350 technical publications and has over 16,200 citations of his papers. He has 10 patents in various fields in engineering and physics. Dr. Holloway was awarded the 2022 Department of Commerce Gold Medal for his work in Rydberg atom-based sensors and the 1999 Department of Commerce Silver Medal for his work on electromagnetic related topics. He also was awarded the 2006 NIST Bronze Medal and the 1998 NTIA Bronze Medal, both for his work in electromagnetics. He also has numerous other awards from various professional societies. He is the Group Leader for the Electromagnetic Fields Group and the Project Leader for the Rydberg-Atom Sensor Project.

Nik Prajapati received his Ph.D. in 2020 from William \& Mary and subsequently joined the National Institute of Standards and Technology (NIST) as a postdoctoral researcher to advance the body of work relating to Rydberg atom-based electric (E) field sensors. He received a National Research Council Postdoctoral Fellowship in the Electromagnetic Fields Group at NIST to measure black body radiation with the Rydberg atom sensor. The body of work around Rydberg atom (highly excited atoms) E-field sensors has been growing at a tremendous rate. These sensors have the potential for detecting fields from DC out to terahertz and field sensitivity to surpass current technologies by a wide margin. The work in Rydberg atoms by Dr. Prajapati has drawn attention internal as he was awarded the CTL Rising Star award for early career scientists. He also received the Department of Commerce Ron Brown Award and Gold medal for Innovation in Science.

Noah Schlossberger is a National Research Council Postdoctoral Fellow at the National Institute of Standards and Technology (NIST) in Boulder, Colorado, USA. He earned his Ph.D. from the University of Colorado Boulder and JILA in 2023 where he contributed to the world's most precise measurement of the electron's electric dipole moment, featured on the cover of *Science* magazine. Dr. Schlossberger currently works on quantum sensing of fields and recently co-developed a novel technique to image electric and magnetic fields in two dimensions. His research interests span applied atomic physics, communications, and signal processing, with a focus on bridging the gap between quantum technologies and real-world applications in precision measurement and field sensing.

TUTORIALS

TU1: Wireless Power Transfer for Electric Vehicles: Magnetic Resonance, Compensation Strategies, Possible Practical Challenges, and V2G Feasibility

TUESDAY JUNE 3, 2025
Aula 7 , 09:00-11:30

Organizer: **Amir Babaki** , Center for Industrial Electronics, University of Southern Denmark
Speakers: **Alireza Ramezan Ghanbari**, V-Research GmbH, Austria
Amir Babaki , Center for Industrial Electronics, University of Southern Denmark

Summary: Wireless Power Transfer (WPT) for Electric Vehicles (EVs) presents significant challenges in system efficiency, power electronics, and grid integration. This half-day tutorial provides a comprehensive exploration of WPT for EVs, focusing on magnetic design, compensation topologies, and practical challenges with high-frequency power converters using WBG switches.
The tutorial will begin with a deep dive into the magnetic aspects of WPT, including coil design, mutual inductance optimization, and Coupled Magnetic Resonance for enhanced efficiency and misalignment tolerance. Next, we will discuss compensation topologies, covering series, parallel, and hybrid configurations to maximize power transfer and maintain stable operation under varying conditions.
Another critical aspect covered will be the role of Silicon Carbide (SiC) switches in high-frequency WPT systems. While SiC devices offer advantages like reduced switching losses and higher efficiency, their implementation presents challenges related to electromagnetic interference, voltage stress, thermal management, and layout design complexity.
Accordingly, this Tutorial aims to formulate false turn-on phenomena and voltage oscillation across switches. In addition, an innovative magnetic-based snubber circuit will be introduced as the next step to realize the viability of the switches without imposing extra power loss. This feature is well-suited to the purpose of using Wide Band Gap switches in power converter.
Finally, we will explore the grid-level impact of WPT, including bidirectional power regulation, V2G and G2V interactions, and WPT topologies with the ability for bidirectional power transfer independent to mutual coupling and load changes. Case studies of real-world WPT implementations will illustrate both the technical and practical considerations.
Target Audience: This tutorial is ideal for researchers, engineers, and industry professionals looking to deepen their understanding of WPT technology, high-frequency power electronics, and its integration into future smart grids.

List of Presentations

Wireless Power Transfer for Electric Vehicles: Magnetic Resonance, Compensation Strategies, and Grid Impact
Alireza Ramezan Ghanbari (V-Research GmbH, Austria)

Wireless Power Transfer for Electric Vehicles: High-Frequency SiC Challenges and innovative practical solution
Amir Babaki (Center for Industrial Electronics, University of Southern Denmark, Denmark)

Organizer and Speaker's Bio:

Amir Babaki received Ph.D. degree in power electronic from the School of Electrical and Computer Engineering, University of Tehran. He was a visiting researcher at IPT Group, University of Auckland, New Zealand in 2019. He joint SDU since 2022 as Postdoc Researcher where he was working in several prectigous Danish funded Project in collaboration with Danfoss drive, Semikron Danfoss and FHkeil. He has authored and co-authored around 30 peer-reviewed publications and book chapters in world-class publications like CRC press and IET power Electronics and is the inventor of 1 pending international patent application. He is currently with the Center for Industrial Electronics (CIE), University of Southern Denmark, Denmark, as Assisstant Professor. His research interests include inductive power transfer, High-efficiency compact converter design, High-frequency planar magnetic design and electric vehicles.

Alireza Ramezan Ghanbari received his Ph.D. in Electrical Engineering from Amirkabir University of Technology, Iran, in 2019. Currently, he is a power electronics researcher and team leader at V-Research, Austria.
His research focuses on the design and control of power electronic converters, power factor correction converters, integrated converter structures, wireless power transfer, and the electromagnetic compatibility of power electronic systems.

TU2: Hands-on tutorial on Near-field inductive transfer

TUESDAY JUNE 3, 2025
Aula 7 , 12:00-14:30

Organizer: **Pablo Pérez-Nicoli,** Facultad de Ingeniería, Universidad de la República, Uruguay
Speaker: **Pablo Pérez-Nicoli,** Facultad de Ingeniería, Universidad de la República, Uruguay

Summary: This tutorial will cover various concepts of wireless power transfer via inductive coupling with a hands-on approach. Attendees will be provided with simulation schematics (LTspice) and calculation scripts (Octave/Matlab) to verify each concept through simulations and calculations (PCs are required).
The concepts will be validated through examples inspired by real-world systems, including active implantable medical devices (AIMDs) and radio-frequency identification (RFID) links. Therefore, we will also address specific design considerations related to the inductive links used in AIMDs and RFID applications, including a historical overview, the current state of the field, and future challenges. The topics will range from basic to intermediate levels, covering series vs. parallel resonance, optimal load conditions, the frequency-splitting effect, output voltage regulation, maximum efficiency point tracking, data communication (telemetry), and the use of passive resonators (N-coil link).
Each topic will first be discussed with the audience, and then there will be time for everyone to familiarize themselves with the concept at their own pace by conducting their own tests in the simulator and comparing

the results with the theoretical models presented. To facilitate calculations with theoretical models, calculation scripts are provided, allowing for an easy comparison between the models and the simulations.
Different architectures of the main circuits used in these systems will also be discussed, including various transmitter driver classes and rectification circuits, evaluating their impact on the link.
This tutorial is based on the book “Inductive Links for Wireless Power Transfer: Fundamental Concepts for Designing High-Efficiency WPT Links” and will be delivered by one of the authors.

Organizer and Speaker's Bio:

Pablo Pérez-Nicoli received his bachelor's degree in electrical engineering in 2013 and the Ph.D. degree in 2018 from the Universidad de la República, Montevideo, Uruguay. He joined the Electrical Engineering Department of the same university in 2012, where he currently holds the position of Associate Professor. His research endeavors revolve around wireless power transmission and the design of ultra-low-power analog integrated circuits. Both his academic and industry-related work have primarily focused on active implantable medical devices (AIMDs). He has been involved in the design of wireless charging circuits and cardiac stimulation systems for AIMDs. He has made contributions to the field, authoring numerous papers and a book titled "Inductive Links for Wireless Power Transfer: Fundamental Concepts for Designing High-efficiency Wireless Power Transfer Links".

TU3: MHz Power Conversion Techniques for Wireless Charging

TUESDAY JUNE 3, 2025
Aula 7 , 15:00-17:00

Organizer: **Minfan Fu**, ShanghaiTech University, Shangai, China
Speakers: **Minfan Fu**, ShanghaiTech University, Shangai, China
Paul D. Mitcheson , Imperial College London, England
Ming Liu, Shanghai Jiao Tong University, Shangai, China

Summary: High-frequency power electronics technology, with its advantages such as reducing component size, increasing power density, and improving control performance, has been widely used in modern power systems and electronic devices. With the extensive use of wide bandgap devices, the process of high-frequency power electronics has significantly accelerated. However, this also brings challenges, such as those related to topology, magnetic design, parameter variation, and controller. MHz single-switch resonant converters are widely used in areas such as wireless power transfer, induction heating, and RF plasma generation due to their simple structure and high operational efficiency. Currently, their classical design methods rely on complex derivations and iterative processes, usually targeting a single design goal. In practical applications, multiple objectives often need to be considered simultaneously. At several MHz, advanced modeling techniques, analytical tools, and system design are vital to addressing these challenges. This tutorial will provide an overview of the principles, topology, modes, analysis, and design methods of ultra-high-frequency resonant converters, comprehensively considering the trade-offs in design for various applications.

Organizers’ and Speakers' Bio:

Dr. **Minfan Fu** received the B.S., M.S., and Ph.D. degrees in electrical and computer engineering from University of Michigan-Shanghai Jiao Tong University Joint Institute, Shanghai Jiao Tong University, Shanghai, China in 2010, 2013, and 2016. He is currently a Tenured Associate Professor at School of Information Science and Technology (SIST), ShanghaiTech University, Shanghai, China. Between 2016 and 2018, he held a postdoctoral position with the Center for Power Electronics Systems (CPES), Virginia Polytechnic Institute and State University, Blacksburg, VA, USA. His research interests include wireless power transfer, ultra-high-frequency power conversion, applications of wide-band-gap devices, magnetic integration, modeling and control of resonant convertors, and ubiquitous power IoT. Dr. Fu is a senior member of IEEE, CPSS, and CES. He holds 18 patents and has published over 70 papers in prestigious IEEE journals. He is the associate editor of WPT, serves as the track or section chair of international conferences for 20 times, and have given 10 tutorials in various conference. He was included on an Elsevier list of the top 2% of scientists in their fields for either single-year impact since 2019. Dr. Fu is in charge of Shanghai's top-tier, key course "Power Electronics". He has won provincial-level teaching competition awards multiple times and is also a popular content creator on Bilibili, with his course videos having over 4.2 million views. The "Power Electronics" course ranks among the top two in overall site rankings.

Paul D. Mitcheson received the M.Eng. degree in electrical and electronic engineering and the Ph.D. degree in micropower motion based energy harvesting for wireless sensor networks from Imperial College London, London, U.K., in 2001 and 2005, respectively. He is currently a Professor in Electrical Energy Conversion with the Control and Power Research Group, Electrical and Electronic Engineering Department, Imperial College London. His research interests include energy harvesting, power electronics, and wireless power transfer to provide power to applications in circumstances where batteries and cables are not suitable. His research has been supported by the European Commission, Engineering and Physical Sciences Research Council, and several companies. Prof. Mitcheson is a fellow of the Higher Education Academy and is on the Executive Committee of the U.K. Power Electronics Centre. He was the General Co-Chair of IEEE Wireless Power Week in 2019 in London, U.K.

Ming Liu received the B.S. degree in mechatronic engineering from Sichuan University, Chengdu, China, in 2007, and the Ph.D. degree in electrical and computer engineering from the University of Michigan-Shanghai Jiao Tong University Joint Institute, Shanghai Jiao Tong University, Shanghai, China, in 2017.,From 2017 to 2020, he was a Postdoctoral Research Fellow with the Department of Electrical Engineering, Princeton University, Princeton, NJ, USA. In 2020, he was with the School of Electronic Information and Electrical Engineering, Shanghai Jiao Tong University, where he is currently an Associate Professor of electrical engineering. His research interests include megahertz wireless power transfer, battery management systems, and high frequency high performance power electronics for emerging applications. Dr. Liu was the recipient of the Top Ten Academic Star Award and the Excellent Ph.D. Thesis Award Nomination from the Shanghai Jiao Tong University, in 2016 and 2018, the Research Excellence Award from AirFuel Alliance, USA, in 2019, the Best Paper Award of IEEE Energy Conversion Congress and Exposition-Asia in 2020, and the Best Student Paper Prize of IEEE WoW in 2021 with his student. He is the Chair of the Wireless Power Transfer for Energy Storage Charging Subcommittee of Energy Storage Technical Committee, IEEE Industrial Electronics Society.

TT TECHNICAL SESSIONS

WEDNESDAY, June 4 2025								
Room	8:30 - 9.00	9:00 - 10:15	10:15-10:45	10:45 - 12:15	12:15 - 14:00	14:00 - 15:30	15:30 - 16:00	16:00 - 17:30
Aula 1	OPENING	Keynotes	Coffee Break	WA1 - Microwave and millimeterwave rectifiers and rectennas	Poster sessions	Keynote WA2 - Innovative WPT solutions for IoT	Coffee Break	WA3 - Devices and novel materials for RF energy harvesting
Sala del Chiostro				WB1 - Magnetic couplers I	*PS1A: WPT coils and resonators I*	WB2 - Magnetic couplers II		WB3 - Dynamic WPT systems I
Aula 8				SS1 - Safety aspects in the exposure assessment of WPT systems	*PS1B: Robotic and biomedical applications*	SS2 - Computational dosimetry for WPT applications		SS3 - Wireless information and power transfer links from microwave to terahertz
Aula 7				Panel - How are we driving adoption of wireless power across sectors. And where are we lagging behind?	*PS1C: Power converters I* --- *Student Design Competition*	Panel - Present & Future high power static and dynamic WPT solutions to enable a true wireless ecosystem		Industry papers
Chiostro	Exhibits							

OPENING

WEDNESDAY, JUNE 3, 2025
Aula 1, 8:30-10:15

Welcome from Chairs and Institutional Representatives

Keynote Speakers

International Exposure Guidelines for Human Protection from Electromagnetic Field – Application to Wireless Power Transfer Systems

Akimasa Hirata (Nagoya Institute of Technology, Japan)

AI for semiconductor design: Hype or Reality?

Alberto Sangiovanni Vincentelli (University of California, Berkeley, USA)

WA1: Microwave and Millimeterwave Rectifiers and Rectennas

WEDNESDAY, JUNE 4, 2025
Aula 1, 10:45 - 12:15

Rectenna Element Module Development for Far-Field Radiative Millimeter Wave Wireless Power Beaming Arrays

Hooman Kazemi, Travis Feenstra and Mike Sotello (Raytheon, USA); Paul Pelletier (Leidos, USA); Anthony Baros (AFRL, USA); Keisuke Shinohara (Teledyne Scientific, USA)

A 24 GHz Band Highly Efficient GaAs 1 W Rectenna MMIC Electromagnetically Coupled With an External AlN Antenna for Thermal Dispersion

Kenji Itoh, Ryosuke Sato, Yuya Hirose, Naoki Sakai, Masaomi Tsuru and Keisuke Noguchi (Kanazawa Institute of Technology, Japan)

A Self-Synchronous X-Band GaN MMIC Rectifier

Alexandra Montgomery (University of Colorado, USA); Jack A Molles, Laila F Marzall and Cody Scarborough (University of Colorado Boulder, USA); Zoya Popovic (University of Colorado at Boulder, USA)

Designing RF-Powered Battery-Less Electronic Shelf Labels with COTS Components

Jarne Van Mulders and Gilles Callebaut (KU Leuven, Belgium)

Printed Antenna for Simultaneous Near- and Far-Field Wireless Power Transfer

Hubregt J. Visser (Imec the Netherlands, The Netherlands)

WB1: Magnetic Couplers I

WEDNESDAY, JUNE 4, 2025
Sala del Chiostro, 10:45 - 12:15

Passive Reactance Compensation for Shape-Reconfigurable Wireless Power Transfer Surfaces

Riku Kobayashi, Yoshihiro Kawahara and Takuya Sasatani (The University of Tokyo, Japan)

Self-Resonant Litz Wire Coil Structure for Wireless Power Transfer Applications

Thomas G Stout II (USA)

Contribution to the Sizing of Circular Coil Assemblies for Class WPT4 of SAE J2954 for Light-Duty Electric Vehicles

Tobias D. Götz, Daniel Fritz, Weizhou Ye, Rinor Krasniqi and Nejila Parspour (University of Stuttgart, Germany)

Impact of Air Gaps in Ferrite on WPT Systems

Cristian Giovanni Colombo, Marco Biasizzo, Alberto Dolara and Michela Longo (Politecnico di Milano, Italy)

Optimization Study of an Highly Coupled IPT System

Madalina Pascaru, Antoine Van Der Laan, Julien Gosteau and Didier Chassaigne (Airbus Central Research and Technology, France); Duleepa J Thrimawithana and Grant A Covic (The University of Auckland, New Zealand); Kai-Yeung Li (University of Auckland & Center for Advanced Materials Manufacturing and Design, New Zealand

SS1: Safety Aspects in the Exposure Assessment of WPT Systems

WEDNESDAY, JUNE 4, 2025
Aula 8, 10:45 - 12:15

Vehicle4em: a Collection of Car Models for Electromagnetic Simulation

Fabio Freschi and Luca Giaccone (Politecnico di Torino, Italy); Vincenzo Cirimele (Department of Electrical, Electronic, and Information Engineering & Alma Mater Studiorum University of Bologna, Italy); Luigi Solimene (Politecnico di Torino, Italy)

EMF Safety Assessment of a Dynamic Wireless Power Transfer System for e-Mobility

Wassim Boumerdassi (Università degli studi dell'Aquila, Italy); Valerio De Santis (University of L'Aquila, Italy); Tommaso Campi (University of Rome Sapienza, Italy); Mauro Feliziani (University of L'Aquila, Italy)

Immunity Study of Pacemakers Near Wireless Power Transfer Systems for Automotive Applications: a First Modelling Approach

Chaïma Elharti and Den God Frez Palessonga (GeePs Laboratory and ESME, France); Lionel Pichon (Group of Electrical Engineering Paris, Universite Paris-Saclay & GeePs Laboratory, France); Mohamed Bensetti (Geeps, France)

Designing an Effective Shielding Mechanism for Secure Wireless Power Transfer Systems

Michele Quercio (Università Degli Studi Roma Tre, Italy); Rafiq Asghar (Roma Tre University, Italy); Lorenzo Sabino (Università Degli Studi Roma Tre, Italy); Davide Milillo (University of RomaTre, Italy); Aldo Canova (Politecnico di Torino, Italy); Francesco Riganti Fulginei (Roma TRE University, Italy)

Active Knee-Implant Supplied by Acoustic Waves

Olivier Freychet (CEA, France); Pierre Tacyniak (TIMA, France); Matthieu Coupet (LATIM, France); Nicolas Garraud (CEA, France); Francois Frassati (CEA, LETI, Minatec, France); Martial Defoort (CNRS - TIMA, France); Samuel Guigo (CHU Brest, France); Valérie Burdin (IMT Atlantique, France); Skandar Basrour (University of Grenoble-Alpes France, France); Guillaume Dardenne (LATIM, France); Pierre Gasnier (CEA, France)

POSTER SESSIONS

WEDNESDAY, JUNE 4, 2025
Cloister Area, 12:15 - 14:00

PS1A: WPT Coils and Resonators I

Primary-Side Estimation of Mutual Inductance in Wireless Power Transfer Under Misalignment of Ferrite Magnetic Couplers

Saidul Alam Chowdhury (University of Auckland, New Zealand); Md Shoaibur Rahman and Pritam Bol (Chittagong University of Engineering and Technology, Bangladesh); Mingdong Edward Han, Aoyang Laurence Li and Aiguo Patrick Hu (The University of Auckland, New Zealand)

Novel Self-Resonant Multilayer on-Board Coil for 85 kHz Wireless Power Transfer

Hayato Nishihata, Naoya Sasa and Takehiro Imura (Tokyo University of Science, Japan); Yoichi Hori (Tokyo University, Japan); Shuntaro Inoue and Yuko Kano (Toyota Central R&D Labs, Japan)

An Interoperability Study of a 10/50 kW Bipolar Vehicle Pad

Lukas Elbracht (University of Stuttgart, Germany); Feiyang Lin (The University of Auckland, New Zealand); Daniel Fritz and Nejila Parspour Parspour (University of Stuttgart, Germany); Grant A Covic and Patrick Lawton (The University of Auckland, New Zealand)

Origami-Inspired PyraCoil for Wireless Power Transfer Systems

Nuvit Ilkin Demirtas and Sampath Jayalath (University of Cape Town, South Africa); Cheng Zhang (University of Manchester, United Kingdom (Great Britain))

Wireless Power Transfer Using an Elliptical Cavity for Automotive Applications

Anushree Dasgupta (Loughborough University, Leicestershire, United Kingdom (Great Britain));

James A. Flint and Stephanos Theodossiades (Loughborough University, United Kingdom (Great Britain))

Design of Qi-Compatible Repeater for Efficient Wireless Power Transfer in Volumetric Resonator

Aigerim Jandaliyeva, Andrey Vdovenko, Mikhail Udrov, Mikhail Siganov, Pavel Seregin, Pavel Belov and Alena Shchelokova (ITMO University, Russia)

A Practical Evaluation of Analytical Resistance Models for Litz Wire

Fraser McDowell, Feiyang Lin, Duleepa J Thrimawithana, Grant A Covic and Patrick Lawton (The University of Auckland, New Zealand)

Dynamic Wireless Power Charger Performance Analysis with Polarized Pads

Abrer Mohsin Samin and Daniela Wolter Ferreira Touma (University of South Alabama, USA); Luiz Lebensztajn (University of Sao Paulo, Brazil)

Effects of Compressive Stress on Ferrites in Inductive Power Transfer

Alexander K Bailey, Jerry Sun, Willsen Wijaya and Seho Kim (The University of Auckland, New Zealand); Tom David Allen (University of Auckland & Centre for Advanced Materials Manufacturing and Design, New Zealand); Grant A Covic (The University of Auckland, New Zealand)

Comparative Analysis of High-Performance Wireless Battery Charging Systems

Giulia Di Capua (University of Cassino and Southern Lazio, Italy); Antonio Maffucci (University of Cassino and Southern Lazio & National Institute of Nuclear Physics, INFN-LNF, Italy); Gennaro Di Mambro (University of Cassino and Southern Lazio, Italy); Femia Nicola (University di Salerno, Italy); Nunzio Oliva and Luca De Guglielmo (EXELING SRL, Italy); Nunzia Fontana, Sami Barmada and Junda Zhu (University of Pisa, Italy)

PS1B: Robotic and Biomedical Applications

Design and Analysis of a 350 W Wireless Charging System for Electric Bike

Sumama Bin Riaz (Information Technology University, Pakistan); Abdullah Baig (Utah State University, USA); Malik Farooq Muhammad, Nahl Adeel, Abdullah Ahmed and Faiza Hamid (Information Technology University, Pakistan); Asif Ali (Information Technology University of the Punjab, Pakistan); Tauseef Tauqeer (ITU, Pakistan); Aakash Hassan (Information Technology University, Pakistan)

Optimized Wireless Power Transfer From Unmanned Aerial Vehicle to Internet of Things Devices

Silvia C Albuquerque and Ursula Resende (Federal Center for Technological Education of Minas Gerais, Brazil); Maurício D Almeida (Centro Federal de Educação Tencológica de Minas Gerais - CEFT-MG, Brazil); Camilla Caroline Moro Carmo (CEFET MG, Brazil); Icaro V Soares (IETR, France & Université de Rennes 1, France)

Wireless Qi-Charged AGV Navigation and Voltage Sensor Fusion for Coil Alignment-Targeted Auto-Parking and Foreign Object Detection

Teodor Cretu, Zachary Molseed, Jonathan Gooch, Girma Tewolde and Chen Duan (Kettering University, USA)

Design of a Wireless Charging System for 300 W-Class Underwater Robots With a 2-Stage Converter for Robustness Against Misalignment

Sungryul Huh (Korea Advanced Institute of Science and Technology (KAIST), Korea (South)); Seongho Woo, Hyunsoo Lee and Seungyoung Ahn (Korea Advanced Institute of Science and Technology, Korea (South))

Advancing Obstructive Sleep Apnea Therapy: a Miniaturized Wireless Implant for Battery-Free Optogenetic Neurostimulation in Mice

Giulia Battistini (University of Bologna, Italy); Elisa Augello (Università di Bologna, Italy); Giacomo Paolini and Diego Masotti (University of Bologna, Italy); Alessandra Costanzo (DEI, University of Bologna, Italy)

Multiobjective Optimization and Thermal Modelling of a Coil System for Transcutaneous Inductive Energy Transfer

Fides Lucia Faber (University of Stuttgart, Germany); Nejila Parspour (Universität Stuttgart, Germany)

Oblique Plane Wave Exposure at 24 GHz of an Advanced Female Anthropomorphic Model

Noemi Dolciotti (Sapienza University of Rome, Italy)

PS1C: Power Converters I

A Novel Primary-Side Control for Integrated Boost Multi-Level Converter in IPT Systems

Zhihao He (University of Auckland, New Zealand); Duleepa J Thrimawithana (The University of Auckland, New Zealand); Bharat Vardani (University of Auckland, New Zealand); Grant A Covic (The University of Auckland, New Zealand); Martin Neuburger (Esslingen, Germany)

A Method for Controlling Desired Power Received by Multiple Buck Converters in Dynamic Wireless Power Transfer of Multiple Power Receiving Systems

Ryota Kojima (Tokyo University of Sciience, Japan); Takehiro Imura (Tokyo University of Science, Japan); Yoichi Hori (Tokyo University, Japan); Yusuke Sato (Tokyo University of Science, Japan)

Simple Identification of Reactive AC-Side Component Values in Resonant Inverters Driving Series RLC Loads in High-Current Applications

Natan Schecter (Ben-Gurion University of the Negev & nT- Tao, Israel); Yael Ditkovich and Alon Kuperman (Ben-Gurion University of the Negev, Israel)

Segmented Rail Flexible Switching Topology and Fast Control Method in Dynamic Wireless Power Transfer System

Xin Gao, Xiaokai Wang, Chang Liu and Chunbo Zhu (Harbin Institute of Technology, China)

Receiver-Side Power Control of a 230-kW Three-Phase DWPT System for Heavy-Duty Vehicles

Vatan Mehar, Isaac S Abram, Nicholas H Frooninckx, Steven Pekarek, Aaron D Brovont and Dionysios Aliprantis (Purdue University, USA)

A Four-Legged Loop Inverter for Two-Lane Dynamic Wireless Power Transfer

Yusaku Takagi, Osamu Shimizu and Hiroshi Fujimoto (The University of Tokyo, Japan)

Isolated Bidirectional Single-Input Multiple-Output Converter for Peer-to-Peer Wireless Power Transfer

Chuyue Ji (City University of Hong Kong, Hong Kong); Ting Leung Albert Lee (University of Hong Kong, Hong Kong); Jiayang Wu, Siew Chong Tan and Shu Yuen Hui (City University of Hong Kong, Hong Kong)

Explicit Impedance Matching Network Design for High Frequency Power Amplifiers Based on the Möbius Transformation

Yongzhi Zhu and Zhan Liu (Shanghai Jiao Tong University, China); Wei Liu (Shanghai Jiaotong University, China); Ming Liu (Shanghai Jiao Tong University, China)

Matrix Converter-Based Three-Phase Modular High-Power Wireless Charging Systems for Heavy-Duty Electric Vehicles

Zichen Deng, Jianning Dong and Pavol Bauer (Delft University of Technology, The Netherlands)

A Single-Stage Bidirectional AC-DC Converter-Based Vehicle-to-Grid Wireless Power Transfer System With Dual LCL Compensation

Yong Ying and Tomokazu Mishima (Kobe University, Japan); Lai Ching-Ming (National Chung Hsing University, Taiwan)

Ultra-Wideband Based Synchronization Method for Bidirectional Wireless Power Transfer Systems

Weizhou Ye, Pratyush Shukla and Nejila Parspour (University of Stuttgart, Germany)

Inductor-Less Direct AC-DC Conversion for Electromagnetic Vibrational Energy Harvester

Md Mahmudul Hasan (University College Cork, Ireland); Sandipan Patra (Tyndall National Institute, Ireland & University College Cork, Ireland); Shafi Khadem (International Energy Research Centre (IERC), Ireland)

WA2: Innovative WPT Solutions for IoT

WEDNESDAY, JUNE 4, 2025
Aula 1, 14:00 - 15:30

Keynote Speaker

Exploring tomorrow's wireless power transfer technologies

Volker Ziegler (Airbus Central Research and Technology, Germany)

Integrated PV Antenna for Cooperative Light and RF Energy Harvesting in the RFID UHF Band

Khodr Hammoud, Yasser Qaragoez, Vladimir Volski, Dominique Schreurs and Sofie Pollin (KU Leuven, Belgium)

Flexible and Scalable Collinear Rectenna Array for IoT Applications

Yuki Tanaka, Hikaru Hamase and Hiroyuki Tani (Panasonic Holdings Corporation, Japan)

Flexible Antennas for Radio Frequency Energy Harvesting Using SSAIL

Justina Zemgulyte, Paulius Ragulis, Romualdas Trusovas, Šarūnas Mickus, Evaldas Kvietkauskas, Modestas Sadauskas and Karolis Ratautas (Center for Physical Sciences and Technology, Lithuania)

WB2: Magnetic Couplers II

WEDNESDAY, JUNE 4, 2025
Sala del Chiostro, 14:00 - 15:30

Conformal Magnetic Metasurface for Wireless Power Transfer With Multi-Receiver and Multi-Frequency Capabilities

Alessandro Luigi Dellabate and Danilo Brizi (University of Pisa, Italy)

Partial Inductance Analysis for PCB Litz Coils in Wireless Power Transfer Systems

Haris Ahmed and Regan Zane (Utah State University, USA); Abhilash Kamineni (ENRX, USA); Yanghe Liu (Toyota Motor North America, USA)

ANN-Based Heat Optimization for IPT Coil

Xiang Gao (Shanghaitech University, China); Kunxiao Zhou (ShanghaiTech University, China); Xiyuan

Lin (Shanghai Tech University, China); Minfan Fu (ShanghaiTech University, China)

Topology Optimization of a VA Plate for SAE-Compliant Wireless Power Transfer System Using Anisotropic SMC Materials

Giulio Poggiana and Riccardo Torchio (University of Padova, Italy); Vincenzo Cirimele (Department of Electrical, Electronic, and Information Engineering & Alma Mater Studiorum University of Bologna, Italy); Fabrizio Dughiero (University of Padova, Italy)

Design Considerations and Effects of Different Quality Factors of the Secondary Pad on Efficiency in Wireless Power Transfer Systems

Daniel Fritz and Lukas Elbracht (University of Stuttgart, Germany); Nejila Parspour (Universität Stuttgart, German

SS2: Computational Dosimetry for WPT Applications: Human Body Absorption and Electromagnetic Interference Challenges

WEDNESDAY, JUNE 4, 2025

Aula 8, 14:00 - 15:30

Wireless Power Transfer: Study of the Impact of the Skin Modelling on Human Exposure Assessment at 24 GHz

Silvia Gallucci (CNR Consiglio Nazionale Delle RIcerche, Italy); Martina Benini (CNR - Consiglio Nazionale Delle Ricerche, Italy); Emma Chiaramello and Serena Fiocchi (CNR - Consiglio Nazionale delle Ricerche, Italy); Gabriella Tognola (CNR - Consiglio Nazionale Delle Ricerche, Italy); Marta Parazzini (IEIIT CNR, Italy)

Plane Wave Absorption in Realistic Body Models at mmWaves

Micol Colella (La Sapienza University of Rome, Italy)

Human-Safe Wireless Power Transfer System for Tabletop TV With Hybrid EMF Reduction Methods

Hyunsoo Lee and Seongho Woo (Korea Advanced Institute of Science and Technology, Korea (South)); Sungryul Huh (Korea Advanced Institute of Science and Technology (KAIST), Korea (South)); Youbin Jun, Seungmin Ha and Kangmin Choi (Korea Advanced Institute of Science and Technology, Korea (South)); Jinhaeng Jang and Seunghun Baek (LG Electronics Inc., Korea (South)); Seungyoung Ahn (Korea Advanced Institute of Science and Technology, Korea (South))

A New Perspective on Resonant Circuit Design to Minimize EMF in Wireless Power Transfer Systems for Electric Vehicles

Seongho Woo (Korea Advanced Institute of Science and Technology, Korea (South)); Yujun Shin (Keimyung University); Sungryul Huh (Korea Advanced Institute of Science and Technology (KAIST), Korea (South)); Hyunsoo Lee and Seungyoung Ahn (Korea Advanced Institute of Science and Technology, Korea (South))

Wireless Power Transfer Through Biological Tissue: the Role of the Interface

Constantin Simovski, Nam Ha-Van and Sergei Tretyakov (Aalto University, Finland)

WA3: Devices and Novel Materials for RF Energy Harvesting

WEDNESDAY, JUNE 4, 2025

Aula 1, 16:00 - 17:30

A Rectenna for RF Energy Harvesting Using a Voltage-Doubling CMOS Rectifier Fabricated in 180-nm Technology

Yoshimori Ryangsu Kaneshiro (Osaka Institute of Technology, Japan & OIT, Japan); Masahiro Hamada (Osaka Institute of Technology, Japan); Shiro Dosho (Tokyo Institute of Technology, Japan)

A High Sensitivity Serial-Path RF Energy Harvester in 65nm CMOS Technology

Shimpei Imoto (Osaka Institute of Technology, Japan); Yoshimori Ryangsu Kaneshiro (Osaka Institute of Technology, Japan & OIT, Japan)

Upper-Bound Performance of Implanted Antennas Made With Laser-Induced Graphene (LIG) for Wireless Power Transfer (WPT) Applications

Francesca Nanni, Alessio Mostaccio and Gaetano Marrocco (University of Rome Tor Vergata, Italy)

Silicon Carbide Photovoltaic Converters: a Revolutionary Technology for Powering Spacecrafts

Javier F. Lozano and N. Seoane (CITIUS, Universidade de Santiago de Compostela, Spain); Enrique Comesaña (Escola Politécnica Superior de Enxeñaría, Campus Terra, Universidade de Santiago, Spain); Florencia Almonacid and Eduardo F. Fernández (Advances in Photovoltaic Technology AdPVTech, University of Jaén, Spain); Antonio Garcia-Loureiro (CITIUS, Universidade de Santiago de Compostela, Spain)

Chip Design for 23.3-dBm Class-E Power Amplifier in 900-MHz Wireless Power Transfer System

Liang Yang (National Chung Hsing University, Taiwan)

WB3: Dynamic WPT Systems I

WEDNESDAY, JUNE 4, 2025

Sala del Chiostro, 16:00 - 17:30

Durability and Lifecycle Requirements of Encapsulation Materials for Wireless Power Transfer Systems in Electric Road Applications

Sophia Jordan (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany); Maximilian Kneidl and Michael Weigelt (Seamless Energy Technologies GmbH, Germany); Michael Masuch (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany); Joerg Franke (FAPS, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany); Florian Risch (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany)

Implementation and Preliminary Static Tests of a Dynamic Wireless Charger for Interurban Roads

Irene Torres-Alfonso (Circe Technology Center, Spain)

Bench-Scale Experiment of Dynamic Wireless Power Transfer System With Grid-Connected Photovoltaic and DC Bus Voltage Control

Nozomi Murayama and Takehiro Imura (Tokyo University of Science, Japan); Yoichi Hori (Tokyo University, Japan)

Experimental Study on Dynamic Characteristics in DWPT System Using Vertical and Horizontal Magnetic Fields

Harutaka Suzuki and Ryosuke Ota (Tokyo Metropolitan University, Japan)

A Cost-Effective and Misalignment-Tolerant Dynamic Wireless Power Transfer System for AGVs Without Feedback Control

Jun Tanaka (Miraxia Edge Technology Company Limited, Japan & Kobe University, Japan)

SS3: Wireless Information and Power Transfer Links from Microwave to Terahertz

WEDNESDAY, JUNE 4, 2025

Aula 8, 16:00 - 17:30

An Alternative Technique for the Evaluation of Wireless-Power-Transfer Efficiency in Near-Field Links Based on Bessel Beams

Luca Del Biondo (Michigan State University, USA); Edoardo Negri, Paolo Burghignoli and Alessandro Galli (Sapienza University of Rome, Italy); Mauro Ettorre (Michigan State University, Electrical and Computer Engineering, USA); Walter Fuscaldo (Consiglio Nazionale delle Ricerche (CNR), Italy)

Beam Shift Effects in Resonant Focusing Devices

Stella Ventucci and Edoardo Negri (Sapienza University of Rome, Italy); Walter Fuscaldo (Consiglio Nazionale delle Ricerche (CNR), Italy); Paolo Burghignoli and Alessandro Galli (Sapienza University of Rome, Italy)

Experimental Comparison of Wireless near-Field Links Based on Gaussian Beams and Bessel Beams

Jérôme Taillieu (Université de Rennes 1, France); Walter Fuscaldo (Consiglio Nazionale delle Ricerche (CNR), Italy); Mauro Ettorre (Michigan State University, Electrical and Computer Engineering, USA); David González-Ovejero (Université de Rennes, France)

Optimal Channels for Power Transfer Between Two Antenna Apertures

Coady K Lewis (University of Michigan, USA); Faris Alsolamy (University of Michigan Ann Arbor, USA); Anthony Grbic (University of Michigan, Ann Arbor, USA)

Agile Microwave WPT Exploiting Circular Array With Optimized Time-Modulated Excitations

Lorenzo Bastia (Università di Bologna, Italy); Tommaso Tiberi (University of Bologna, Italy); Lorenzo Poli (ELEDIA Research Center, University of Trento, Italy); Paolo Rocca (University of Trento & ELEDIA

Industry and Application Papers

WEDNESDAY, JUNE 4, 2025

Aula 7, 16:00 - 17:30

Load-Independent ZVS Class-E Inverters and Active Rectifiers Using Möbius Transform Filters

Robert A Moffatt (Etherdyne Technologies Inc., USA); Goran Popovic (Etherdyne Technologies, Inc., USA)

Automated Sensor Localization and Optimized Power Transmission in OWPT Networks

Sungsoo Choi, Keedong Yang and Duchang Heo (Korea Electrotechnology Research Institute, Korea (South)); Sang-Hwa Yi (Korea ElectroTechnology Research Institute, Korea (South)); Jung Hyun Park (Quantum Semiconductor International, Korea (South))

Photovoltaic Laser Power Converter for OWPT Network System Using Multiple AE Sensors

Duchang Heo, Keedong Yang and Sungsoo Choi (Korea Electrotechnology Research Institute, Korea (South)); Sang-Hwa Yi (Korea ElectroTechnology Research Institute, Korea (South)); Jacoby Yoon (Quantum Semiconductor International (QSI), Korea (South)); Jung Hyun Park (Quantum Semiconductor International, Korea (South))

Simple V-Band GaN Diode Rectifier Measurement Methodology

Till Schmidt (IMS Laboratory, University Bordeaux, BordeauxINP & CNRS UMR 5218, France); Simon Hemour and Magali De Matos (University of Bordeaux, France); Wilson Maia (Thales Research & Technology, France)

Helmholtz Coil Type Wireless Power Transfer Platform for Drone

Minzhang Liu and Jiafeng Zhou (University of Liverpool, United Kingdom (Great Britain))

THURSDAY, June 5 2025							
Room	**8:45- 10:15**	**10:15-10:45**	**10:45 - 12:15**	**12:15 - 14:00**	**14:00 - 15:30**	**15:30 - 16:00**	**16:00 - 17:30**
Aula 1	**Keynote** **TA1 - Rectifiers**	**Coffee Break**	**TA2 - Wireless power beaming**	**Poster sessions** ***PS2A Advances in capacitive WPT*** ***PS2B Progress in far field WPT I*** ***PS2C WPT for electric vehicles*** ***SSP Wireless Power transfer meets AI: Exploring new frontiers*** --- ***Student Design Competition***	**Keynote** **TA3 - Space solar power**	**Coffee Break**	**TA4 - Machine-learning-assisted WPT systems**
Sala del Chiostro	**TB1 - Biomedical applications I**		**TB2 - Dynamic WPT systems II**		**TB3 - Power Electronics I**		**TB4 - Power electronics II**
Aula 8	**SS4 - Modeling, controls, and identifications in high power inductive charging**		**SS5 - Capacitive WPT**		**SS6 - Wireless charging technologies for underwater devices**		**SS7 - Sustainable wireless technologies enabled by backscattering**
Aula 7	**Panel: WPT and sustainability**		**Panel: RF wireless power: technology, applications, and lessons learned**		**Panel**		**IEEE MTT-S ASK US ANYTHING**
Chiostro	**Exhibits**						

TA1: Rectifiers

THURSDAY, JUNE 5, 2025

Aula 1, 8:45 - 10:15

Keynote Speaker

High-power bidirectional wireless charging of electric vehicles

Chris Mi (San Diego State University, USA)

Rectifier Current-Based Mistuned Compensation Network Design for High-Power IPT Systems

Dengke Zheng (University of Auckland, New Zealand); Feiyang Lin and Grant A Covic (The University of Auckland, New Zealand)

A Comparative Study on Synchronous Rectification Techniques With Voltage Sensor and GNSS in Dynamic Wireless Power Transfer Systems

Takachika Hatano (Tokyo Denki University, Japan); Ryosuke Ota (Tokyo Metropolitan University, Japan); Daiki Satou (Tokyo Denki University, Japan); Hiroyasu Kobayashi (Chiba University, Japan)

A High Efficiency Rectifier for a 500W High-Q Inductive Drone Charger at 13.56MHz

Jianguo Wang and Artur M Benedito Nunes (University of Warwick, United Kingdom (Great Britain)); Mike J Taylor and William R Law (Inductive Power Projection Ltd, United Kingdom (Great Britain)); Gary J Milton (Inductive Power Projection, United Kingdom (Great Britain)); Richard McMahon (University of Warwick, United Kingdom (Great Britain))

TB1: Biomedical Applications I

THURSDAY, JUNE 5, 2025

Sala del Chiostro, 8:45 - 10:15

Analysis of Eddy Current Losses in Wirelessly Charged Implantable Devices

Xiyuan Lin, Siyi Yao and Pengyu Chen (Shanghai Tech University, China); Xiang Gao (Shanghaitech University, China); Minfan Fu (ShanghaiTech University, China)

Frequency-Up Electrodynamic Receiver for Extremely-Low Frequency Wireless Power Transfer for Implanted Devices

Rémi Recoquillé (CEA-Leti, Université Grenoble Alpes & SYMME, Université Savoie Mont Blanc, France); Pierre Gasnier and Nicolas Garraud (CEA, France); Adrien Morel (Université Savoie Mont Blanc, France); Adrien Badel (Université de Savoie, France)

Field Shaping for Enhanced Wireless Power Transfer in Misaligned Biomedical Inductive Links

Cian O'Donnell (MCCI, Ireland & Tyndall National Institute, Ireland)

An Equivalent Circuit Model for Designing Wireless Programmable FSS for WPT EMI Suppression and Secure Communication of Implanted Devices

Francesco Lestini and Gaetano Marrocco (University of Rome Tor Vergata, Italy); Cecilia Occhiuzzi (University of Roma Tor Vergata, Italy)

Flexible Implantable Medical Devices With Inductive Power Transfer and Frequency-Shift Keying Communication

Bruno Miguel Gil Rosa and Paul Mitcheson (Imperial College London, United Kingdom (Great Britain))

SS4: Modeling, Controls, and Identifications in High Power Inductive Charging

THURSDAY, JUNE 5, 2025

Aula 8, 8:45 - 10:15

Circulating Current Modeling in Multi-Transmitter Inductive Wireless Power Transfer System

Junhui Yang (City University of Hong Kong, Hong Kong); Chaoqiang Jiang (City University of Hong Kong, China); Tianlu Ma (City University of Hong Kong, Hong Kong); Shen Ren (CityU, Hong Kong); Zhaozheng Zhu (City University of Hong Kong, Hong Kong); Chen Chen (Cityu, Hong Kong)

Comparative Analysis of LCC and Series Compensation for Dynamic Wireless Power Transfer Systems

Tianlu Ma and Junhui Yang (City University of Hong Kong, Hong Kong); Yibo Wang and Shen Ren (CityU, Hong Kong); Jiaqi Huang (City University of Hong Kong, Hong Kong); Chaoqiang Jiang (City University of Hong Kong, China)

Critical Design Factors for Inductive Power Transfer Couplers Utilizing Structurally Anisotropic Alloys
Yibo Wang (CityU, Hong Kong); Chaoqiang Jiang (City University of Hong Kong, China); Yue Liu (City University of Hong Kong, Hong Kong); Shen Ren (CityU, Hong Kong); Zhaozheng Zhu, Junhui Yang and Ben Zhang (City University of Hong Kong, Hong Kong)

A Dependable Communication Solution With Enhanced Pairing for Inductive Charging Systems
Jonas Enderlin and Leon Loeser (Delta Energy Systems, Germany)

A Bidirectional IPT EV Charging Power Class Interoperable Wireless Synchronization Controller
Patrick Lawton, Feiyang Lin, Grant A Covic, Shaorong Liu and Andrew Sknar (The University of Auckland, New Zealand)

TA2: Wireless Power Beaming

THURSDAY, JUNE 5, 2025

Aula 1, 10:45 - 12:15

Modeling and Development of a Wireless Power Beaming (WPB) System Achieving >87.4% Beam Collection Efficiency
Adnan Basir Patwary (The University of Texas at Dallas, USA); Ifana Mahbub (University of Texas at Dallas, USA)

Subarraying Strategy in Phased Arrays Using Beamforming With Broad Nulls for Microwave Power Transfer
Zhengdong Lin, Shun Shibuya, Hiroyuki Morikawa and Yoshiaki Narusue (The University of Tokyo, Japan)

Multiport Pi-Network Implementation of Decoupling Network for MIMO Wireless Power Transfer
Allan Jose Mesa, Jr (University of the Philippines Diliman, Philippines); Charleston Dale M Ambatali (University of the Philippines, Philippines)

Automatic Remote Calibration System for Active Arrayed Wireless Power Transmitter
Sang-Hwa Yi (Korea ElectroTechnology Research Institute, Korea (South))

Simplified-Controlled Phased Array System for Wireless Power Transfer
Bo Yang, Naoki Shinohara and Tomohiko Mitani (Kyoto University, Japan); Heng-Ming Hsu (National Chung-Hsing University, Taiwan)

TB2: Dynamic WPT Systems II

THURSDAY, JUNE 5, 2025

Sala del Chiostro, 10:45 - 12:15

Profitability and Cost-Effectiveness Analysis of Wireless and Conductive Charging Infrastructure for Autonomous Fleets: Insights From Real-World Data
Myrel Tiemann (University of Wuppertal, Germany); Michael Böhm (City Bad Staffelstein, Germany); Norman Haußmann (University of Wuppertal, Germany); Markus Clemens (University of Wuppertal & Chair of Electromagnetic Theory, Germany); Benedikt Schmuelling (University of Wuppertal, Germany)

Design and Optimization of PCB-Based Passive Shielding Leakage Magnetic Suppression for Dynamic Wireless Power Transfer
Junda Zhu, Sami Barmada, Nunzia Fontana and Antonino Musolino (University of Pisa, Italy); Giulia Di

Capua and Gennaro Di Mambro (University of Cassino and Southern Lazio, Italy); Antonio Maffucci (University of Cassino and Southern Lazio & National Institute of Nuclear Physics, INFN-LNF, Italy); Femia Nicola (University di Salerno, Italy)

Folded-Coil-Based Output Voltage Stabilization Technique for Dynamic Wireless Power Transfer Systems

Buzhao Niu (CRRC Qingdao Sifang Co. Ltd., China); Kaijun Du (CRRC Qingdao Sifang Co. Ltd., China & Southwest Jiaotong University, China); Chang Peng, Jin Yu, Dongyu Zhao, Pengfei Chi and Miao Wang (CRRC Qingdao Sifang Co. Ltd., China)

Magnetic Field Reduction in Dynamic Wireless Power Transfer Systems Using Passive Cancellation Loops

Wassim Boumerdassi (Università degli studi dell'Aquila, Italy); Tommaso Campi (University of Rome Sapienza, Italy); Silvano Cruciani (Tor Vergata University of Rome, Italy); Francescaromana Maradei (University of Rome La Sapienza, Italy); Mauro Feliziani (University of L'Aquila, Italy)

Vehicle Steering Control with Lateral and Angular Misalignment Estimation Based on Receiver Current in Dynamic Wireless Power Transfer

Ryota Tauchi, Yusaku Takagi, Osamu Shimizu and Hiroshi Fujimoto (The University of Tokyo, Japan)

SS5: Capacitive WPT

THURSDAY, JUNE 5, 2025

Aula 8, 10:45 - 12:15

Frequency Bifurcation for Enhanced Power Output in a Capacitive Wireless Power Transfer System With Two Transmitters and Two Receivers

Aris van Ieperen (University of Antwerp, Belgium); Stijn Derammelaere (University of Antwerp - Flanders Make, Belgium); Ben Minnaert (University of Antwerp, Belgium)

Power Converter for Use in Quasi-Wireless Capacitive Power Robotic Systems With Secondary Side Sensing and Switching

Carson D Pope and Charles W Van Neste (Tennessee Technological University, USA); Darren Boyd (NASA MSFC, USA)

A Novel Wireless Power Transfer System with Capacitive Transmitters and Inductive Receiver for Undersea Applications Huan Wu, Jiang You, Chao Jia, Tiantian Wang, Xin Lv, Mengyao Wang, Longlei Bai and Bo Luo (Harbin Engineering University, China)

Investigating the Use of Lunar Sand to Expand the Area Where Wireless Power Can Be Supplied to Mobility Vehicles Operating on the Lunar Surface

Takanori Washiro, Yohei Toriumi and Madoka Takahashi (Nippon Telegraph and Telephone Corporation, Japan)

Dual-Input Single-Output DC-DC Conversion for Common-Mode Current Suppression in Misaligned Resonant Capacitive Power Transfer Systems

Ethan T Belliveau and Chris D. Rouse (University of New Brunswick, Canada)

POSTER SESSIONS

THURSDAY, JUNE 5, 2025
Cloister Area, 12:15 - 14:00

PS2A: Advances in Capacitive WPT

Quantification of Plate-Bending on the Mutual Coupling Capacitance in a Capacitive Power Transfer System

Kiran Peirens, Ben Minnaert and Amélie Chevalier (University of Antwerp, Belgium)

ZPA Tuning Method for LCC-s IPT System Using Two Switch-Controlled Capacitors on the Primary Side

Živadin Despotović, Dejan Reljić and Veran Vasić (University of Novi Sad, Serbia)

High Frequency, Primary Sided, Auto-Tuning Control System for Capacitive Wireless High Power Transfer

Arthur Cloet (KU Leuven, Belgium); Hamed Farbakhsh and Ben Minnaert (University of Antwerp, Belgium); Michael Kleemann (KU Leuven, Belgium)

Comparing the Class E and Phi_2 Inverter Topologies for 13.56MHz Resonant Capacitive Power Transfer

Matthew MacMillan and Chris D. Rouse (University of New Brunswick, Canada)

Modeling and Parameter Identification of Underwater Single Capacitor Coupled WPT System

Chaolai Da (Institute of Electrical Engineering, Chinese Academy of Sciences, China & University of Chinese Academy of Sciences, China); Lifang Wang, Fang Li, Chengxuan Tao and Shufan Li (Institute of Electrical Engineering, Chinese Academy of Sciences)

Power Scaling Architecture for Electric Vehicle Multi-MHz Capacitive Wireless Charging Systems

Dheeraj Etta, Sounak Maji, Syed Saeed Rashid and Khurram K Afridi (Cornell University, USA)

Analytical Study on the Performance of a Hybrid Inductive-Capacitive Wireless Power Transfer System

Baptist Elst and Ben Minnaert (University of Antwerp, Belgium)

Introducing Relay-Repeaters for Hybrid Inductive-Capacitive Wireless Power Transfer

Baptist Elst and Hamed Farbakhsh (University of Antwerp, Belgium); Arthur Cloet and Michael Kleemann (KU Leuven, Belgium); Ben Minnaert (University of Antwerp, Belgium)

PS2B: Progress in Far Field WPT I

Energy Efficient SVELM for SWIPT Based WPSN

Berin Shalu (Vellore Institute of Technology, India & None, India)

A Low-Power Rectenna With 1.5 V DC Output for Wirelessly Powering Sensors

Haoming He (Sichuan University, China); Che Dan (Southwest China Research Institute of Electronic Equipment, China); Zhongqi He, Changjun Liu and Liping Yan (Sichuan University, China)

A Loss Calculation Method Considering Diode Characteristics and Mounting Effect

Lu Yili and Qian Sihao (Xidian University, China); Ce Wang (Sichuan University, China)

RF Rectifier With Pixel-Like Network and Inductive Matching Technique

Muh-Dey Wei (RWTH Aachen University & High Frequency Electronics, Germany); Yu-Ting Zhuo (National Chin-Yi University of Technology, Taiwan); Lukas Hüssen (RWTH Aachen University, Germany); Guo-Shiang Lin (National Chin-Yi University of Technology, Taiwan); Renato Negra (RWTH Aachen University, Germany)

Solar Power Based Subsea Docking Station for Wireless Charging of AUVs

Abhishek Singhal and Ashutosh Rai (Indian Institute of Technology Mandi, India); Narsa Reddy Tummuru and G Shrikanth Reddy (IIT Mandi, India)

Performance Analysis of Passive and Active Wireless Sensor Nodes for Energy-Efficient IoT Applications

Paulo Capitão (University of Aveiro, Portugal); Helena Ribeiro (Universidade de Aveiro, Portugal &

Instituto de Telecomunicações, Portugal); Pedro Pinho (UA - Universidade de Aveiro & IT - Instituto de Telecomunicações, Portugal); Nuno Borges Carvalho (Universidade de Aveiro, Portugal & InstitutodeTelecomunicacoes, Portugal)

Applications for a Through the Soil System Based on Radial Voltage Distributions

Christopher S Johnson (Tennessee Technological University, USA); Erlind Boraj (Tennessee Tech University, USA); Charles W Van Neste (Tennessee Technological University, USA)

PS2C: WPT for Electric Vehicles

Assessment of Single- and Three-Phase Wireless Power Transfer Systems Under Aligned Conditions

Carina Damhuis (Technical University of Munich, Germany); Hans-Georg Herzog (Technical University of Munich (TUM), Germany)

Analysis of a WPT3 11kW Wireless Power Transfer System Based on IEC 61980 and ISO 19363/SAE J2954 Reference Coil and System Designs

Maximilian Hollenbach (Institut für Automation und Kommunikation e. V. Magdeburg, Germany); Leo Anton Hinrichsmeyer (Institut für Automation und Kommunikation e.V., Germany); Christian Koker and Maxim Nesterov (Institut für Automation und Kommunikation e.V., European Union)

Position-Insensitive Wireless Power Transfer System for Long-Range Moving Seat in Autonomous Electric Vehicles

Kye-Seok Yoon (Electronics and Telecommunications Research Institute, Korea (South)); Sang-Won Kim, Gwangzeen Ko, In-Kui Cho and Seong-Min Kim (ETRI, Korea (South))

Foreign Object Detection Using Total Harmonic Distortion of Input Current

Phemelo Maile and Sampath Jayalath (University of Cape Town, South Africa)

Vehicle-to-Vehicle Wireless Power Transfer in Electric Vehicles for Input Supply Outage Scenarios

Ashutosh Rai and Abhishek Singhal (Indian Institute of Technology Mandi, India); Narsa Reddy Tummuru and Venkat Ratnam Vakcharla (IIT Mandi, India)

Automotive Drive Cycle Loss Analysis of a Wireless Power Transfer System for Electric Vehicle Traction Machine Rotor Excitation Andreas Gneiting, Felix Dominik Burkard and Andreas Baehr (University of Stuttgart, Germany); Nejila Parspour (Universität Stuttgart, Germany)

Double-Sided Voltage-Source Model of an Inductive Wireless Power Transfer System for Electric Vehicles

Carlos Revert Ferrero, Carlos Masia Agullo, Alexis A. Narvaez Acaro, Francisco Gonzalez Espin and Philip Grapherr (MAHLE Electronics, Spain)

SSP: Special Session - Wireless Power Transfer Meets AI: Exploring New Frontiers

THURSDAY, JUNE 5, 2025
Cloister Area, 12:15 - 14:00

Symbolic Regression Method for Estimating Distance Between Two Coils of a Inductive Wireless Power Transfer System Davide Milillo (University of RomaTre, Italy); Lorenzo Sabino (Università Degli Studi Roma Tre, Italy); Rafiq Asghar (Roma Tre University, Italy); Francesco Riganti Fulginei (Roma TRE University, Italy)

Neural Network Method for Distance Prediction and Impedance Matching of a Wireless Power Transfer System

Lorenzo Sabino (Università Degli Studi Roma Tre, Italy); Davide Milillo (University of RomaTre, Italy);

Fabio Crescimbini (Università ROMA TRE, Italy); Francesco Riganti Fulginei (Roma TRE University, Italy)

Optimizing PI Controller Tuning for Frequency Control in Inductive Wireless Power Transfer Systems Using Genetic Algorithms Gabriele Maria Lozito, Lorenzo Becchi, Marco Bindi, Fabio Corti and Matteo Intravaia (University of Florence, Italy); Lorenzo Sabino (Università Degli Studi Roma Tre, Italy)

Optimizing the Design of a LCC-s Resonant Converter for Wireless Power Transfer Using an Artificial Neural Network Vittorio Bertolini (Università degli Studi di Perugia, Italy); Lorenzo Sabino (Università Degli Studi Roma Tre, Italy); Davide Milillo (University of RomaTre, Italy); Riccardo Scorretti (University of Perugia, Italy & CNRS, France)

Machine Learning-Based Prediction of Magnetic Field Patterns in Wireless Power Transfer
Rafiq Asghar (Roma Tre University, Italy); Lorenzo Sabino (Università Degli Studi Roma Tre, Italy); Davide Milillo (University of RomaTre, Italy); George Cristian Lazaroiu (University Politehnica of Bucharest, Romania); Francesco Riganti Fulginei (Roma TRE University, Italy)

TA3: Space Solar Power

THURSDAY, JUNE 5, 2025
Aula 1, 14:00 - 15:30

Keynote Speaker

The Sun-chasing project: Innovation, simulation, prototype and experiment

Duan Baoyan (Xidian University, Xi’an, China

Prediction and Compensation of Position and Attitude Deviation of Ultra-Large Scale Antenna Arrays for Space Solar Power Station
Xinyu Su (China Academy of Space Technology (Xi'an) & National Key Laboratory of Science and Technology on Space Microwave, China)

Phased Demonstration Approach for Microwave Wireless Power Transmission Technology in MW-Level Space Solar Power Stations (SSPS)
ZhengAi Cheng (Qian Xuesen Laboratory or Space Technology, China); Shi-Wei Dong (China Academy of Space Technology (Xi'an), China); Xinbin Hou (China Academay of Space Technology, China)

Beam Pointing Error Mitigation Capabilities of the Cassiopeia Array for Frequency Offset Retrodirective Space Based Solar Power
Neil Buchanan (Queens University Belfast, United Kingdom (Great Britain)); Yat Hin Chan (Queens University Belfast & ECIT, United Kingdom (Great Britain))

TB3: Power Electronics I

THURSDAY, JUNE 5, 2025
Sala del Chiostro, 14:00 - 15:30

An Inductive-Capacitive-Split Impedance Matching Approach Based on Two-Port Network in High Frequency Switched Mode Power Amplifier

Wei Liu (Shanghai Jiaotong University, China); Yongzhi Zhu and Ming Liu (Shanghai Jiao Tong University, China)

A 125 kHz Self-Oscillating Inverter for Inductive Power Transfer Applications With Power MOSFET in-Circuit Self-Test

Michael Benegiamo (University of Perugia, Italy); Lorenzo Mariani (Università degli Studi di Perugia, Italy); Anil Kumar Behera, Marco Dionigi, Giulia Orecchini and Valentina Palazzi (University of Perugia, Italy); Luca Moriconi (ELES Semiconductor Equipment, Italy); Federico Alimenti (University of Perugia, Italy)

A Wide-Range Decoupled Autonomous Wireless Power Transfer System

Weiceng Zeng, Keyu Hang, Lei Zhao, Xin Dai, Chunsen Tang and Zhihui Wang (Chongqing University, China)

Class Φ2 Inverter Based on a Fully Analytical Model for Wireless Power Transfer System

Le Quang Hieu Nguyen (CEA-Leti, Grenoble Alpes University, France); Nicolas Garraud (CEA, France); Leo Sterna (CEA Leti Grenoble, France); Francois Frassati (CEA, LETI, Minatec, France); Sébastien Boisseau (CEA, France)

Enhancing Conversion Efficiency in Megahertz Wireless Power Transfer Systems with Schottky Freewheeling Diodes

Mingshuo Zhu, Kerui Li, Siew Chong Tan and Shu Yuen Hui (City University of Hong Kong, Hong Kong

SS6: Wireless Charging Technologies for Underwater Devices

THURSDAY, JUNE 5, 2025
Aula 8, 14:00 - 15:30

Large Signal Modeling of LCC-s Power Converter Considering Parasitic Components for UWPT Applications

Vittorio Bertolini (Università degli Studi di Perugia, Italy); Riccardo Scorretti (University of Perugia, Italy & CNRS, France); Antonio Faba and Ermanno Cardelli (University of Perugia, Italy)

Optimizing Wireless Power Transfer for Underwater Vehicles: a Neural Network Method for Distance Prediction and Impedance Matching

Lorenzo Sabino (Università Degli Studi Roma Tre, Italy); Davide Milillo (University of RomaTre, Italy); Fabio Crescimbini (Università ROMA TRE, Italy); Francesco Riganti Fulginei (Roma TRE University, Italy)

Harnessing Symbolic Regression Optimizing Distance Estimation for Wireless Power Transfer in Underwater Vehicles Davide Milillo (University of RomaTre, Italy); Lorenzo Sabino (Università Degli Studi Roma Tre, Italy); Rafiq Asghar (Roma Tre University, Italy); Francesco Riganti Fulginei (Roma TRE University, Italy)

Effects of Salinity in an Inductive Wireless Charger for Autonomous Underwater Vehicles

Inmaculada Casaucao (University of Málaga, Spain); Alicia Triviño (University of Malaga, Spain)

Design of a WPT System With a Cylindrical Repeater Coil for AUVs

Mei-Fang Wang, An-Jie Lan, Cheng-Hao Weng, Bo-Jie Huang and Tzung-Lin Lee (National Sun Yat-sen University, Taiwan)

TA4: Machine-learning Assisted WPT Systems

THURSDAY, JUNE 5, 2025
Aula 1, 16:00 - 17:30

Machine Learning Based Accurate Modeling of Rectenna Nonlinear Behavior

Taoning Zhan (HKUST (GZ), China); Shanpu Shen (Univ of Liverpool, United Kingdom (Great Britain)); Danny H.K. Tsang (HKUST, Hong Kong)

Deep Learning and Fine-Tuning for Receiver Position Estimation in Distributed Microwave Power Transfer

Sora Miyazawa, Shun Yamanaka and Zhengdong Lin (The University of Tokyo, Japan); Yuki Tanaka (Panasonic Holdings Corporation, Japan); Tatsuo Yagi (Panasonic, Japan); Hiroshi Sato (Panasonic Corporation, Japan); Yoshio Koyanagi (Panasonic, Japan); Hiroyuki Morikawa and Yoshiaki Narusue (The University of Tokyo, Japan)

Sequential Feedback-Based Phase Optimization Using Hadamard Basis for Wireless Power Transfer

Young-Seok Lee, Jungsuek Oh and Sangwook Nam (Seoul National University, Korea (South))

8x8-Helical Antenna Array WPT Beamforming Using the Deep Learning Method

Yat Hin Chan (Queens University Belfast & ECIT, United Kingdom (Great Britain)); Neil Buchanan (Queens University Belfast, United Kingdom (Great Britain))

Modular Artificial Neural Networks for Wireless Power Transfer Optimization in Sensor-Driven Industrial IoT

Elisa Augello (Università di Bologna, Italy); Diego Masotti (University of Bologna, Italy); Alessandra Costanzo (DEI, University of Bologna, Italy)

TB4: Power Electronics II

THURSDAY, JUNE 5, 2025
Sala del Chiostro, 16:00 - 17:30

IPT-Based Snubber Circuit With Virtual Compensation for Voltage Suppression Across WBG Switches Used in Power Converters

Amir Babaki (The University of Southern Denmark, Denmark); Thomas Ebel (CIE SDU, Denmark)

De-Embedding Packaged GaN HEMTs for Highly Efficient PA With the Transmission Matrices

Shi-Wei Dong (China Academy of Space Technology (Xi'an), China)

Proposal of Dual-Side Transient Shaping Pulse Density Modulation for Wireless Power Transfer Systems

Yoshinori Akamine (The University of Tokyo, Japan); Ryo Matsumoto (University of Tokyo, Japan); Hiroshi Fujimoto (The University of Tokyo, Japan)

An Active Front-End Converter with Wide DC-Link Voltage for Inductive Power Transfer Systems

Kunal Kundanam, Udaya Madawala, Grant A Covic and Feiyang Lin (The University of Auckland, New Zealand)

Design of a 13.56 MHz Inductive Power Transfer System With Closed-Loop Output Regulation and Active Soft-Switching

Prateek Wagle, Ioannis Nikiforidis and Xianzao Li (Imperial College London, United Kingdom (Great Britain)); Roberto La Rosa (STMicroelectronics, Italy); Paul Mitcheson (Imperial College London, United Kingdom (Great Britain))

SS7: Sustainable Wireless Technologies Enabled by Backscattering

THURSDAY, JUNE 5, 2025
Aula 8, 16:00 - 17:30

Zero-Power Backscattering Through DC-RF Impedance Conversion for Wireless IoT Sensing

Dongchi Zhang and Jiteng Ma (University of Bristol, United Kingdom (Great Britain)); Simon Hemour (University of Bordeaux, France); Xiaoqiang Gu (University of Bristol, United Kingdom (Great Britain))

Backscattering-Based Security in Wireless Power Transfer Applied to Battery-Free BLE Sensors

Taki Eddine Djidjekh (LAAS-CNRS, France); Gaël Loubet (LAAS-CNRS & INSA Toulouse, France); Alexandru Takacs (LAAS-CNRS Université de Toulouse, France)

Passive Wireless Platform for Resistive Sensors

Gonçalo P Martins (IT Aveiro, Portugal); Nuno Borges Carvalho (Universidade de Aveiro, Portugal & InstitutodeTelecomunicacoes, Portugal)

When Light Meets RF: Integrating SWIPT, SLIPT, and Backscattering for Localization

Yasser Qaragoez and Khodr Hammoud (KU Leuven, Belgium); Marja Valimaki (VTT Technical Research Centre of Finland, Finland); Sofie Pollin and Dominique Schreurs (KU Leuven, Belgium)

On the Performance of Harmonic Backscattering for Zero-Energy Devices

Paschalina Foti (Ericsson AB, Sweden); Boules Mouris (Ericsson Research, Sweden); Thiemo Voigt (RISE Computer Science & Uppsala University, Sweden); Mahmoud Zaher (KTH Royal Institute of Technology, Sweden); Mehrnaz Afshang (Ericsson Research, USA)

FRIDAY, June 6 2025								
Room	8:45- 10:15	10:15-10:45	10:45 - 12:15	12:15 - 14:00	14:00 - 15:30	15:30 - 16:00	16:00-17:00	17:00-17:30
Aula 1	Keynote 6 FA1 - Scalable rectennas and reconfigurable surfaces	Coffee Break	FA2 - Simultaneous wireless information and power transfer	Poster sessions *PS3A: WPT Coils and resonators II* *PS3B: Power converters II* *PS3C: Progress in far field WPT II*	FA3 - Optimized solutions to transmit and receive RF power	Coffee Break	FA4 - WPT control	CLOSING
Sala del Chiostro	FB1 - EMC/EMI		FB2 - High-efficiency compensation strategies		FB3 - Advances in near-field WPT		FB4 - Misalignment & mismatch tolerant WPT	
Aula 8	SS8 - Microwave and RF power rectification.		SS9 - The exploratory application of magnetic material for WPT		FC3 - Biomedical applications II		FC4 - Advances in near-field WPT II	
Aula 7	Recently published journal paper presentations in NF WPT		Recently published journal paper presentations in RF WPT		Invited talk Panel – EiC European Innovation Council			
Chiostro	Exhibits							

FA1: Scalable Rectennas and Reconfigurable Surfaces

FRIDAY, JUNE 6, 2025

Aula 1, 8:45 - 10:15

Keynote Speaker

Scalable X-band Rectenna Arrays for Energy-Denied Environments

Zoya Popovic (University of Colorado, Boulder, USA)

An Energy-Autonomous Reconfigurable Surface With Dual-Polarized Unit Cells for Simultaneous Beam Steering and Energy Harvesting

Sergio Ortiz-Ruiz (University of Granada, Spain); Simone Trovarello (University of Bologna, Italy); Francisco Pasadas Cantos (University of Granada, Spain); Diego Masotti (University of Bologna, Italy); Francisco García Ruiz (University of Granada, Spain); Alessandra Costanzo (DEI, University of Bologna, Italy)

Beamformer Design in RIS-Assisted Multi-Carrier SWIPT System With Sub-THz Transmission

Mateen Ashraf and Taneli Riihonen (Tampere University, Finland)

Simulation Verifications of a Beam Synthesis Method on a Phased Array System in the Radiating Near Field

Yuki Kagata, Bo Yang, Naoki Shinohara and Tomohiko Mitani (Kyoto University, Japan)

FB1: EMC/EMI

FRIDAY, JUNE 6, 2025

Sala del Chiostro, 8:45 - 10:15

Reduction of Reactive Currents in Strongly Coupled Sub-Resonant Inductive Wireless Power Transfer Systems with Uncompensated Receiver

Andrey Vulfovich, Yegal Darhovsky and Alon Kuperman (Ben-Gurion University of the Negev, Israel)

Novel Split Impedance-Matching-Architecture to Reduce EMI and Current in the Interconnection Cable of a Two Box WPT System for EV Charging

Younghun Lee and Alexander Simon (Siemens AG Germany, Germany); Martin Pavlovsky (Siemens AG, Germany)

Derivation of Low-Order Harmonic Leakage Magnetic Fields in Double-LCC Circuit and Its Effectiveness for Their Reduction

Ryoto Kobayashi, Kaito Takashima and Takehiro Imura (Tokyo University of Science, Japan); Yoichi Hori (Tokyo University, Japan)

Shielding Impact on Conducted Emission of a kW-Level WPT System: an Experimental Approach

Mattia Simonazzi (University of Bologna, Italy); Vincenzo Cirimele (Department of Electrical, Electronic, and Information Engineering & Alma Mater Studiorum University of Bologna, Italy); Riccardo Mandrioli and Leonardo Sandrolini (University of Bologna, Italy)

Chaotic PWM Technique for Conducted-EMI Mitigation on High Gain DC DC Converters

Nandhini M (VIT, India); Sudhakar Natarajan (VIT University, India)

SS8: Microwave and RF Power Rectification

FRIDAY, JUNE 6, 2025

Aula 8, 8:45 - 10:15

Far-Field Wireless Power Transfer Enabled Supercapacitor-Energized IoT Sensor System

Haowen Cai and Wei Lin (The Hong Kong Polytechnic University, Hong Kong)

A Custom C Band High-Power GaN-Based Rectifier for WPT Systems

Xiaochen Yu (National Tsing Hua University, Taiwan & University of Liverpool, United Kingdom (Great Britain)); Haoran Wang, Yeke Liu, Po-Yen Huang, Ta-Jen Yen and Shawn S. H. Hsu (National Tsing Hua University, Taiwan); Yejun He and Chaoyun Song (Shenzhen University, China); Yi Huang and Jiafeng Zhou (University of Liverpool, United Kingdom (Great Britain))

A 5.8 GHz High-Power Reflector Rectenna for Space Based Solar Power

Robert C Jones (Queen Mary University of London, United Kingdom (Great Britain)); Rostyslav Dubrovka (Queen Mary, University of London, United Kingdom (Great Britain)); Clive Parini and Xiaodong Chen (Queen Mary University of London, United Kingdom (Great Britain))

A Self-Powered Reconfigurable Metasurface Enabled by Integrated Compact Rectifying Surface

Fangwei Li, Kai Song and Changjun Liu (Sichuan University, China); Bo Yang and Naoki Shinohara (Kyoto University, Japan); Liping Yan (Sichuan University, China)

Design and Analysis of a 2.45 GHz RF Energy Harvesting Device

Daniel Poehl (Graz University of Technology & NXP Semiconductors Austria, Austria); Ulrich

Muehlmann (NXP Semiconductors, Austria); Franz Amtmann (NXP Semiconductors Austria GmbH, Gratkorn, Austria); Peter Thueringer (NXP Semiconductors Austria, Austria); Jasmin Grosinger (Graz University of Technology, Austria)

FA2: Simultaneous Wireless Information and Power Transfer

FRIDAY, JUNE 6, 2025

Aula 1, 10:45 - 12:15

Reconfigurable Microwave Filter for Simultaneous Wireless Information and Power Transfer

Ruipeng Zhang, Jiteng Ma, Hao Li and Xiaoqiang Gu (University of Bristol, United Kingdom (Great Britain)); Gavin Watkins (Toshiba Research Europe Ltd., United Kingdom (Great Britain)); Andrew C M Austin and Shuping Dang (University of Bristol, United Kingdom (Great Britain))

Wireless Power and Data Transfer System by Decoupled Dipole Coils with Full-Duplex Mode

Peiyue Wang, Tianxu Feng, Jincheng Jiang and Ke Shi (Chongqing University of Posts and Telecommunications, China)

Experiments on a Communication and WPT Integrated System Using UWB-Based Position Estimation

Yuta Nakamoto (Softbank Corp., Japan); Naoki Hasegawa (Softbank, Japan); Takashi Hirakawa (SoftBank Corp., Japan); Yuki Takagi (Softbank corp., Japan); Yoshichika Ohta (Softbank Corp., Japan)

Simultaneous Energy Harvesting and Bidirectional Communication in a Dual-Band Batteryless IoT Node

Yasser Qaragoez, Sofie Pollin and Dominique Schreurs (KU Leuven, Belgium)

High Data-Rate SWIPT System with Adaptive Resonant Frequency Control and FSK Modulation

Shota Kobayashi (Shibaura Institute of Technology, Japan)

FB2: High-Efficiency Compensation Strategies

FRIDAY, JUNE 6, 2025

Sala del Chiostro, 10:45 - 12:15

Bifurcation-Based Coupling Estimation Method for LCC-s or Double LCC Compensated Inductive Power Transfer Systems

Michal Kosik (Czech Technical University in Prague, Czech Republic)

Investigating the Effects of Coil Architecture on the Design of Adaptive Compensation Systems

Artur M Benedito Nunes, Arkadeep Deb and Richard McMahon (University of Warwick, United Kingdom (Great Britain))

Tuning of Compensation Networks for High-Power Wireless Power Transfer Systems

Marco Biasizzo, Alberto Dolara, Delia Guarnaschelli, Sonia Leva and Emanuele Ogliari (Politecnico di Milano, Italy)

Dynamic Modeling of Series-Parallel Compensated Wireless Power Transfer Systems for iEESM Applications Using an LPV Approach

Felix Dominik Burkard, Andreas Baehr and Andreas Gneiting (University of Stuttgart, Germany); Nejila Parspour (Universität Stuttgart, Germany)

Design Considerations for LCC - LCC Wireless Power Transfer Systems Utilizing Passive Rectifiers

Lukas Elbracht, Tobias D. Götz and Nejila Parspour (University of Stuttgart, Germany)

SS9: The Exploratory Application of Magnetic Material for Wireless Power Transfer

FRIDAY, JUNE 6, 2025

Aula 8, 10:45 - 12:15

Nanocrystalline Shield in Inductive Power Transfer Pads for EV Charging Applications

Wenting Zhang, Seho Kim and Grant A Covic (The University of Auckland, New Zealand); Zhichao Luo (South China University of Technology, China)

A Novel Multi-Layer Planar Transmitting Coil for Omnidirectional Wireless Charging in Capsule Endoscopy

Heng Zhang (The University of Hong Kong, Hong Kong); Chi-Kwan Lee (University of Technology Sydney, Australia)

Parity-Time Symmetric Wireless Power Transfer System With Battery Load

Xianglin Hao and Chi K. Tse (City University of Hong Kong, Hong Kong); Shen Ren (CityU, Hong Kong); Shiqing Cai (Xi'an Jiaotong University, China)

Loss Measurements of CFRP Covers for Inductive Power Transfer Magnetics

Jerry Sun and Alexander K Bailey (The University of Auckland, New Zealand); Tom David Allen (University of Auckland & Centre for Advanced Materials Manufacturing and Design, New Zealand); Willsen Wijaya, Seho Kim, Maedeh Amirpour and Grant A Covic (The University of Auckland, New Zealand)

Transient Loss Measurement and Simulation in Ferrite Tiles for WPT-Systems

Leonard Schmidt, Daniel Fritz, Lukas Elbracht and Marco Zimmer (University of Stuttgart, Germany); Nejila Parspour (Universität Stuttgart, Germany)

POSTER SESSIONS

FRIDAY, JUNE 6, 2025
Cloister Area, 12:15 - 14:00

PS3A: WPT Coils and Resonators II

A Compact Solenoid Magnetic Coupler for UAV Wireless Charging

Tianxu Feng, Liukang Tang, Junjie Mou, Xi Wang, Qian Tang and Peiyue Wang (Chongqing University of Posts and Telecommunications, China)

Optimization of Ferrite Plate Arrangement for GA Sheet Coils for EV-WPT

Akane Arakawa (Dai Nippon Printing Co., Ltd.); Masato Okabe (Mobility Operations, Japan); Junya Otsuki (Mobility Operations & Dai Nippon Printing Co., Ltd., Japan); Hiroyuki Hase (Dai Nippon Printing Co., Ltd., Japan); Hitoshi Miyagawa (Dai Nippon Printing Co., Ltd.)

Optimisation of Three-Phase Winding for Roadway Inductive Power Transfer to Electric Vehicles

Brian Gu (University of Auckland, New Zealand); Seho Kim, Michael O'Sullivan and Grant A

Covic (The University of Auckland, New Zealand) Ruihan Ma, Shuang Li, Yu Xiao, Ming Liu and Chengbin Ma (Shanghai Jiao Tong University, China) (IEE of CAS, China); Fang Li (Chinese Academy of Sciences, China); Chaolai Da (Institute of Electrical Engineering, Chinese Academy of Sciences, China & University of Chinese Academy of Sciences, China); Junqiao Huang and Ming Nie (Institute of Electrical Engineering, Chinese Academy of Sciences, China)

Ferrite Core Designs for Orthogonal Planar Transmitter Coils for Wireless Charging of UAVs and Drones

Gianluca N Patrizi and Sampath Jayalath (University of Cape Town, South Africa)

Comparative Coreloss and Thermal Analysis of Ferrite Core Under Monoresonant and Multiresonant Compensation Circuits for Wireless Charging

Hassan Pervaiz (KU Leuven & Energyville, Belgium)

Structural Modeling and Assessment of Rigid Pavement With Embedded Dynamic Wireless Power Transfer Components

Oscar Andrés Moncada, Jin Li, Pablo Orosa Iglesias and John E Haddock (Purdue University, USA)

Design of Magnetic Flux Concentrator Plates Using SMC and Ferrite With Topology Optimization for WPT Systems in Industrial Forklifts

Giulio Poggiana, Matteo Zorzetto, Riccardo Torchio and Fabrizio Dughiero (University of Padova, Italy)

Mechanical Reliability of PCB-Based Wireless Power Transfer Coils

Ankush Chohan and Sampath Jayalath (University of Cape Town, South Africa)

Calculation of Eddy Current Losses and System Optimization in Magnetic-Field Coupled Wireless Power Transfer

Ziyuan Lin (Institute of Electrical Engineering, Chinese Academy of Sciences, China); Lifang Wang (IEE of CAS, China); Fang Li (Chinese Academy of Sciences, China); Chaolai Da (Institute of Electrical Engineering, Chinese Academy of Sciences & University of Chinese Academy of Sciences, China); Junqiao Huang (Institute of Electrical Engineering, Chinese Academy of Sciences, China); Ming Nie (Institute of Electrical Engineering, Chinese Academy of Sciences, China

Coil Design for Power Stability in WPT Based on Curve-Surfaced Characteristics

Ruihan Ma (Shanghai Jiao Tong University, China); Shuang Li (Shanghai Jiao Tong University, China); Yu Xiao (Shanghai Jiao Tong University, China); Ming Liu (Shanghai Jiao Tong University, China); Chengbin Ma (Shanghai Jiao Tong University, China)

PS3B: Power Converter II

A Comparison of Soft-Switching Active Bridge Converters for Wireless Power Transfer Systems

Ryohei Okada and Ryosuke Ota (Tokyo Metropolitan University, Japan); Nobukazu Hoshi (Tokyo University of Science, Japan)

Dual-Frequency Reconfigurable s/SP WPT System With Multiple Charging Modes Using Pulse Density Modulation

Zhiwei Xue (The University of Hong Kong, Hong Kong); Kt Chau and Wei Liu (The Hong Kong Polytechnic University, Hong Kong); Rui Lyu (The University of Hong Kong, Hong Kong); Yunhe Hou (University of Hong Kong, China)

Load-Independent ZVS Class-E Inverters and Active Rectifiers Using Mobius Transform Filters

Robert A Moffatt (Etherdyne Technologies Inc., USA); Goran Popovic (Etherdyne Technologies, Inc., USA)

Load-Independent Class-E/F2 Topologies for Low-Loss UHF Power Inverters

Laura C. Medina (SENER Aeroespacial, Spain); Jesús Borjas, Yurena Lorenzo and José A García (Universidad de Cantabria, Spain)

An on Board Charger and Wireless Receiver Integrated Topology Based on Decoupled Magnetic Circuit and Multifunction Power Bridge

Wentao Wu and Ming Liu (Shanghai Jiao Tong University, China)

Frequency Control for Improving Power Factor in Dynamic Wireless Power Transfer to Electric Vehicle

Yutaka Shikauchi (The University of Tokyo, Japan & Advanced Energy, Japan); Osamu Shimizu and Hiroshi Fujimoto (The University of Tokyo, Japan); Kenichiro Takahashi (Honda R&D, Japan)

An Impedance Compression Network for a Current Source Based Inductive Power Transfer System

Bharat Vardani (University of Auckland, New Zealand); Duleepa J Thrimawithana and Grant A Covic (The University of Auckland, New Zealand)

Lumped-Element Model Approach to Suppression of Radiation of Resonator-Based Inductive WPT System

Nikita Mikhailov, Marina Abrosimova, Evgenii Maiorov, Alena Shchelokova and Pavel Belov (ITMO University, Russia)

Dual-Receiver Wireless Power Transfer System With Constant Output Voltage Against Resonance Mismatch via Front-End Frequency Control

Saidul Alam Chowdhury (University of Auckland, New Zealand); Angkur Barua (Chittagong University of Engineering and Technology, Bangladesh); Mingdong Edward Han, Aoyang Laurence Li and Aiguo Patrick Hu (The University of Auckland, New Zealand)

Investigation of Maximum Efficiency in WPT in the MHz Band Under Varying Load and Coupling Coefficient While Satisfying ZVS

Kotaro Takayama, Weisen Luo and Takehiro Imura (Tokyo University of Science, Japan); Yoichi Hori (Tokyo University, Japan)

A Non-Linear Model of an Impedance Compression Network for Inductive Charging of Electric Vehicles

Cody Liu (University of Auckland, New Zealand); Duleepa J Thrimawithana, Feiyang Lin and Grant A

Covic (The University of Auckland, New Zealand); Morris Kesler (WiTricity Corporation, USA)

PS3C: Progress in Far Field WPT II

RF Energy Harvester Design Using a Dual-Band Rectenna for Ultra-Low-Power Electronic Systems
Shabnam Parween (National Institute of Technology, Silchar, Assam, India); Banani Basu (NIT Silchar, India); Taimoor Khan (National Institute of Technology Silchar, India)

Rectangular Subarrays Tiling Method for Isophoric Microwave Power Transmit Arrays
Chunhuai Xue (School of Electro-Mechanical Engineering, Xidian University, China); Xun Li and Longfei Liu (Xidian University, China)

The Characteristics of Rectifiers With Frequency Modulated Waves Input
Takashi Hirakawa (SoftBank Corp., Japan); Naoki Hasegawa (Softbank, Japan); Yuta Nakamoto (Softbank Corp., Japan); Yuki Takagi (Softbank corp., Japan); Yoshichika Ohta (Softbank Corp., Japan)

A Bandwidth-Enhanced Metasurface for Wireless Energy Harvesting
Xiangyan Liu, Ning Liu and Xianjun Sheng (Dalian University of Technology, China)

Coexistence Challenges: Analyzing SBSP-Induced Interference in Terrestrial Communication Systems
André Silva Santos (IT Aveiro, Portugal); Nuno Borges Carvalho (Universidade de Aveiro, Portugal & InstitutodeTelecomunicacoes, Portugal); Ricardo Figueiredo (Instituto de Telecomunicações, Portugal); Aidan Cowley (ESA, European Union)

Design of Transmit and Receive Transducers in Ultrasonic Wireless Transmission
Xinyue Man and Chunying Wang (Harbin Engineering University, China)

Enabling SWIPT With Machine Learning-Based Multisine Signal Classification
Petros Stylianou and Elio Faddoul (University of Cyprus, Cyprus); Mohamed Korium (Lappeenranta-Lahti University of Technology, Finland); Ioannis Krikidis (University of Cyprus, Cyprus)

Study on Improvement of Microwave Penetration Through Wall by Applying Resonant-Type Wireless Power Transfer
Yuki Yano, Naoki Shinohara, Tomohiko Mitani and Bo Yang (Kyoto University, Japan)

FA3: Optimized Solutions to Transmit and Receive RF Power

FRIDAY, JUNE 6, 2025
Aula 1, 14:00 - 15:30

Broadband Circularly Polarized Antenna With Stable Flat-Top Gain
Nguyen Danh Manh, Man, Le Xuan The Anh, The-Anh and Kyusik Woo (Soongsil University, Korea (South)); Choi Yunsung (Soongsil, Korea (South)); WonHo Jang (Korea Radio Promotion Association, Korea (South)); Chulhun Seo (Soongsil University, Korea (South))

Multi-Directional Energy Focusing for Next-Generation Wireless Power Transmission Networks
Amarnath Kumar (IIT Guwahati, India & Indian Institute of Technology, India); Chayanika Baishya (IIT Guwahati, India); Sisir Kumar Nayak (Indian Institute of Technology Guwahati, India)

Designing of a High Gain Circular Polarization Wireless RF Energy Harvesting System with Non-Dead

Zone Region DucDung Nguyen (University of Soongsil & BWERC, Korea (South)); Choi Yunsung (Soongsil, Korea (South)); Kyusik Woo and Chulhun Seo (Soongsil University, Korea (South))

Experimental Validation of the Transparent Fresnel Zone Lens at 28 GHz

Amit Kumar Baghel (Universidade de Aveiro, Portugal & IT AVEIRO, Portugal); Vítor Sencadas (Universidade de Aveiro, Portugal); Nuno Borges Carvalho (Universidade de Aveiro, Portugal & InstitutodeTelecomunicacoes, Portugal); Pedro Pinho (UA - Universidade de Aveiro & IT - Instituto de Telecomunicações, Portugal)

Interference Study of Power Transmission Microwaves to Pilot Signal Receiving Antenna

Shun Yoshinari and Koutarou Matsumoto, Sr (Kyoto University & Research Institute for Sustainable Humanosphere Shinohara Labratory, Japan); Tomohiko Mitani and Naoki Shinohara (Kyoto University, Japan)

FB3: Advances in Near-Field WPT I

FRIDAY, JUNE 6, 2025
Sala del Chiostro, 14:00 - 15:30

Meta-Model Based WPT Optimization: UAV Application

Mohammed Terrah (GeePs CentraleSupelec)

Modeling and Performance of a 75 kW Industrial Wireless Charger

Andrew W Green (Delta Energy Systems, Germany)

Investigation of Two Types of Modular WPT Systems for Heavy-Duty Vehicles

Lei Li, Feiyang Lin and Grant A Covic (The University of Auckland, New Zealand)

Multiplexing Wireless Power Transfer System for EV Charging Stations

Shibo Zhang, Jianning Dong and Pavol Bauer (Delft University of Technology, The Netherlands)

Parameterized Models of Double-D Coils for DWPT Applications Through Deep Learning Techniques

Jegannathan Srinivasan (Indian Institute of Technology, Jammu, India); Andrea Mancinoni and Daniele Romano (University of L'Aquila, Italy); Sonia Leva and Michela Longo (Politecnico di Milano, Italy); Mauro Parise (Università Campus Bio-Medico di Roma, Italy); Giulio Antonini (University of L'Aquila, Italy)

FC3: Biomedical Applications II

FRIDAY, JUNE 6, 2025
Aula 8, 14:00 - 15:30

Miniaturized Electrodynamic Generator for Wireless Power Transfer and Positionning Control of an Endoscopic Capsule

Nicolas Garraud (CEA, France); Anh-Tuan Vo (CEA-Leti, France)

A Power Efficient LCC-C Compensated Wireless Charging System for Head Mounted Deep Brain Stimulation

Kemal Sahin and Sevilay Cetin (Pamukkale University, Turkey)

A High Power Density Wireless Power Transfer System for Total Artificial Hearts

Jamie Gawith and James Smith (University of Bath, United Kingdom (Great Britain))

Wireless Power Transfer System for Motorized Intramedullary Nail

Adina B. Barba (University of Rome Tor Vergata & Radio6ense Srl, Italy); Carolina Miozzi (University of Rome "Tor Vergata", Italy & Radio6ense Srl, Italy); Sara Amendola (University of Rome Tor Vergata & Radio6ense srl, Italy); Francesco Romoli Venturi (Radio6ense srl, Italy); Piero Tognolatti (University of L'Aquila, Italy); Gaetano Marrocco (University of Rome Tor Vergata, Italy)

Optical Wireless Charging to Deeply Implantable Biomedical Devices Using 810 nm NIR LED: a Feasibility Study

Syifaul Fuada (University of Oulu, Finland & Universitas Pendidikan Indonesia, Indonesia); Mariella Särestöniemi (University of Oulu & Research Unit of Health Sciences and Technology and Center for Wireless Communication, Finland); Marcos Katz (University of Oulu, Finland)

FA4: WPT Control

FRIDAY, JUNE 6, 2025
Aula 1, 16:00 - 17:00

Online Estimation of Coupling Coefficient and Output Voltage of Wireless Power Transfer System Based on Primary Side Monitoring and Data Processing

Mingdong Edward Han and Aoyang Laurence Li (The University of Auckland, New Zealand); Saidul Alam Chowdhury (University of Auckland, New Zealand); Aiguo Patrick Hu (The University of Auckland, New Zealand)

Switch-Controlled Variable Inductance in Wireless Power Transmitters for Stable Coupling Coefficient

Enrico Alfredo Bottaro (STMicroeletronics, Italy); Giovanni Vinci, Mario Pavone and Davide Auteri (STMicroelectronics, Italy)

A Near-Field Communication Coil Integrated With a Metasurface

Zahra Hamzavi-Zarghani and Jasmin Grosinger (Graz University of Technology, Austria)

FB4: Misalignment and Mismatch Tolerant WPT

FRIDAY, JUNE 6, 2025
Sala del Chiostro, 16:00 - 17:00

A Misalignment-Insensitive WPT System Using Load Tracking Control Strategy for AGVs

Lai Ching-Ming (National Chung Hsing University, Taiwan); Yu-Feng Chung (National Taitung University, Taiwan); Tomokazu Mishima (Kobe University, Japan)

Optimization of the Wireless Power Transfer Receiver in Electromagnetic Halbach Array System for Enhanced Transmission Uniformity

Ziyi Ran, Xianghe Luo and Dibin Zhu (Shanghai Jiao Tong University, China)

A Misalignment-Tolerant Autonomous Charging-Mode Management for Stationary Wireless EV Charging

Rui Lyu (The University of Hong Kong, Hong Kong); Kt Chau and Wei Liu (The Hong Kong Polytechnic University, Hong Kong); Yunhe Hou (University of Hong Kong, China)

FC4: Advances in Near-Field WPT II

FRIDAY, JUNE 6, 2025
Aula 8, 16:00 - 17:00

Performance Evaluation of Carrier Harmonics Self-Excitation Type Three-Phase PCB Rotary Transformer with Varying Air- Gap Length

Masahiro Aoyama and Haruhiko Terada (Shizuoka Institute of Science and Technology, Japan)

Integrated Resonant Track for High-Efficiency Wireless Power Transfer in ISM Bands

Ananth Bharadwaj (Birla Institute of Technology Science Pilani Dubai Campus, United Arab Emirates & Birla Institute of Technology Science Pilani Goa Campus, United Arab Emirates); Molefi Makhetha (Durban University of Technology, South Africa & Central University of Technology, South Africa)

Design of a Room-Sized Volumetric Resonator for Wireless Power Transfer With Enhanced Safety

Aigerim Jandaliyeva, Nikita Mikhailov, Alena Shchelokova and Pavel Belov (ITMO University, Russia)

CLOSING

FRIDAY, JUNE 6, 2025
Aula 1, 17:00 - 17:30

PANEL SESSIONS

HOW ARE WE DRIVING ADOPTION OF WIRELESS POWER ACROSS SECTORS. AND WHERE ARE WE LAGGING BEHIND?

WEDNESDAY, JUNE 4, 2025
Aula 7, 10:45 – 12:15

Organizer and Moderator: **Dinesh Kithany** (WAWT, UK)

Speakers:
Energous (TBD)
Asterlink (TBD)
Delta Electronics (TBD)
InductEV (TBD)
WAWT (TBD)

PRESENT AND FUTURE HIGH POWER STATIC AND DYNAMIC WPT SOLUTIONS TO ENABLE A TRUE WIRELESS ECOSYSTEM?

WEDNESDAY, JUNE 4, 2025
Aula 7, 14:00 – 15:30

Organizers: **Grant Covic** (University of Auckland, New Zealand)
Andreas Wendt (Electreon, Germany)

Moderator: **Grant Covic (**University of Auckland, New Zealand)

Speakers:
Airbus (TBD)
ASPIRE – Mike Masquellier
DENSO (TBD)
Electreon – Andreas Wendt
EnRX – Christian Koebel
InductEV (TBD)

WPT AND SUSTAINABILITY

THURSDAY, JUNE 5, 2025
Aula 7, 8:45 – 10:15

Organizers: **Dominique Schreurs** (KU Leuven, Belgium)
Nuno Carvalho (University of Aveiro, Portugal)
Speakers: (TBD)

RF WIRELESS POWER: TECHNOLOGY, APPLICATIONS, AND LESSONS LEARNED

THURSDAY, JUNE 5, 2025
Aula 7, 10:45 – 12:15

Organizer and Moderator: **Sanjay Gupta** (AirFuel Alliance, USA)

Speakers: Giampaolo Marino, Energous, USA
Christian Ferrier, E-Peas, Switzerland
Naoki Shinohara, Kyoto University, Japan
Sanjay Gupta, AirFuel Alliance, USA

HOW FAR, EFFICIENTLY AND PRACTICALLY, CAN WE WIRELESSLY CHARGE? AND WHAT??

THURSDAY, JUNE 5, 2025
Aula 7, 14:00 – 15:30

Organizer: **Dinesh Kithany** (WAWT, UK)

Speakers: (TBD)

MTT-S “Ask us Anything" Workshop

THURSDAY, JUNE 5, 2025
Aula 7, 16:00 – 17:30

Organizer: **Simon Hemour** (University of Bordeaux, France)

Space Solar Power

FRIDAY, JUNE 6, 2025
Aula 7, 14:00 – 15:30

Invited talk

Space Solar Power: Closer Than You Think
Greg Durgin (Georgia Tech, USA)

PANEL - Space Solar Power EU INNOVATION COUNCIL

Organizers: **Erika Vandelle** (Thales Research & Technology, France)
Simon Hemour (University of Bordeaux, France)

"Towards a bio-mimetic sunlight pumped laser based on photosynthetic antenna complexes", *Universita Degli Studi Di Firenze, Istituto Nazionale Di Ricerca Metrologica, Università di Parma, Consiglio Nazionale Delle Ricerche, Insitute of Organic Chemistry – Polish Academy of Sciences, Karlsruher Institut Fuer Technologie, Technische Universitaet Muenchen, Max-Planck-Gesellschaft Zur Fordering Der Wissenschaften EV*

" Rectenna in millimeter-wave frequency range for high-power energy reception"
Thales Research & Technology, Thales Alenia Space, Université de Bordeaux, Institut Polytechnique de Bordeaux, Stichting IMEC Nederland, Universita Degli Studi di Perugia, Luna Geber Engineering SRL

*"*SiC-based High-Efficiency High-Power Optical Transmission Systems for Spacecrafts"
Universidad de Santiago de Compostela, Universidad de Jaen, Danmarks tekniske universitet, Friedrich-Alexander-Universitaet Erlangen-Nuernberg, Moverim SRL, Alminica AB

RECENTLY PUBLISHED JOURNAL PAPER PRESENTATIONS

RECENTLY PUBLISHED JOURNAL PAPER PRESENTATIONS IN NEAR FIELD WPT

FRIDAY, JUNE 6, 2025
Aula 7, 8:45 - 10:15

Organizer: **Paul Mitcheson** (Imperial College, UK)

A 9 kW 3.47 MHz Wireless Power Transfer System with a Parallel Differential Class E Inverter for Industrial Applications, IEEE Journal of Emerging and Selected Topics in Power Electronics

I Nikiforidis, K Bampouras, P Wagle, DC Yates, PD Mitcheson

Presented by Ioannis Nikiroridis

Evaluation and Suppression of High Frequency Radiated EMI in Inductive Power Transfer System, IEEE Transactions on Power Electronics

H Li, M Fu

Presented by Minfan Fu.

Anisotropic Characterization of Nanocrystalline Alloys for Inductive Power Transfer, IEEE Open Journal of Power Electronics

AK Bailey, W Zhang, S Kim, GA Covic

Presented by Alex Bailey

30kW Bidirectional Inductive Power Transfer Charger with Intermediate Coil for EV Applications, IEEE Transactions on Power Electronics

N Mirković, LR Chamorro, A Delgado, P Alou, M Vasić

Presented by Nikola Mirkovic

Optimal Cancellation Loop Termination to Reduce the Magnetic Field in WPT Systems, IEEE Transactions on Electromagnetic Compatibility

S Cruciani, T Campi, F Maradei, M Feliziani

Presented by Silvano Cruciani

RECENTLY PUBLISHED JOURNAL PAPER PRESENTATIONS IN RF WPT

FRIDAY, JUNE 6, 2025
Aula 7, 10:45 - 12:30

Organizer: **Alessandra Costanzo and Nuno Carvalho**

(TBD)

STUDENT DESIGN COMPETITION

The IEEE Global Student Wireless Power Competition encourages young generations to join research and development of WPT (Wireless Power Transfer) technologies and demonstrates WPT capabilities for promoting public acceptance and practical applications of WPT systems.

First stage selected projects:

1. Compact Design for AC/DC Wireless Charger with minimum switch count (Vietnam)
2. Construction and Optimization of Power Transfer Route in Array Wireless Power Transfer Network (Chongqing University, China)
3. Enhanced Radiative Wireless Power Transmission for Servo Operation (University of Aviero, Portugal)
4. Design of A Magnetic Coupler with Novel Laminated Cores for 11.1 kVA High-power Inductive Power Transfer (City university of Hong Kong, Hong Kong SAR)
5. Wireless Power Transfer System Using Millimetre-Wave Leaky-Wave Arrays with Beam Focusing and Steering Capabilities (Lancaster University, UK)
6. WiSeTop: Wireless Self-Resonant structures via Topology Optimization (University of Padova, Italy)
7. Highly-Misalignment-Tolerant, Cost-Effective and Control-Free Dynamic Wireless Power Transfer System for 24 X 7 Tirelessly-Working AGV (South China University of Technology, China)
8. Hybrid Light and RF Localization in Drone-Assisted Sensor Networks (Waves: Core Research and Engineering (WaveCore), KU Leuven, Belgium)
9. The Wireless Power TV (Lehigh University, USA)
10. Stable and Practical Operation for Multi-receiver Wireless Power Transfer Systems by Estimating Mutual Inductance Estimation (Korea advanced institute of science and technology (KAIST), Republic of Korea)
11. Advancing Obstructive Sleep Apnea Treatment with a Soft, Implantable, and Wireless Optoelectronic System (University of Bologna, Italy)
12. Wireless Power Transfer System with Multiple Constant Voltage Outputs for Serially Connected Applications (Korea advanced institute of science and technology (KAIST), Republic of Korea)
13. Origami-Inspired Wireless Power Transfer System (University of Capetown, South Africa)
14. A Novel Multi-layer Planar Transmitting Coil to Perform Omnidirectional Wireless Charging for Capsule Endoscopy (University of Hong Kong, Hong Kong SAR)
15. Autonomous Wireless Charging of Battery-less Robots for Sea and Fresh Water Farming (University of Auckland, New Zealand)

Selected teams will create a short video explaining how the project works and demonstrating the power transfer. The video should be no longer than 10 minutes and it should show all parts of the project. Then an onsite demonstration of the projects will be presented during the conference

Live Demo: **June 4, 2025 from 12.15am to 2pm**

June 5, 2025 from 12.14am to 2pm

Each selected team will perform a practical demonstration of the project.

N.B. Each team is responsible for bringing in all the tools and systems required for the proper functioning of the demo

Final award ceremony: **Closing session, June 6, 2025**

The first stage selected projects will be evaluated based on the short videos uploaded and the on-site demonstration by a qualified jury.

The top **three** projects will receive a final award sponsored by

SOCIAL EVENTS

Welcome Reception – Tuesday, June 3, 2025, 19:00-22:30

Location: Palazzo Brancaccio

Viale del Monte Oppio, 7 - - 00184 Roma

Tel. +39 06 4873177, E-Mail: palazzobrancaccio@palazzobrancaccio.com

Palazzo Brancaccio is a magnificent 19th-century residence and a timeless icon of Colle Oppio, nestled in the very heart of Rome. Built in 1870 to host the noble Brancaccio-Field family, Palazzo Brancaccio today stands as a premier venue for distinguished events. Its grand interiors, verdant gardens, and exquisite artistic detailing provide a breathtaking setting for unforgettable occasions—imbued with the charm, elegance, and prestige they so richly deserve.




Gala Dinner – Thursday, June 5, 2025, 19:45- 22:45

Location: Grand Hotel Plaza

Via del Corso, 126, 00186, Rome - Italia

Tel. +39 06 67495, E-Mail: plaza@grandhotelplaza.com

Beginning at the Porta del Popolo—magnificently reimagined by Bernini with a striking scenographic flair—you arrive at the splendid Piazza del Popolo, long considered the open-air salon of the Eternal City, Rome. Continuing along the northern stretch of Via del Corso, the avenue unfolds before the Church of San Carlo, a site consecrated since Roman times, just steps from the majestic Mausoleum of Augustus.

It is here that the luxury Grand Hotel Plaza rises—a symbol of refined Roman hospitality. The atmosphere within the Plaza is truly singular, as though time itself has paused to preserve and celebrate the eternal cultural spirit of the city. While it evokes the grandeur of antiquity, there is nothing outdated in its design: every detail reflects a contemporary vision of beauty, comfort, and a hospitality that speaks the timeless language of art.

Among its most notable residents was the celebrated composer Pietro Mascagni, who made the Grand Hotel Plaza his home from 1927 until his passing in 1945. The hotel was a cherished sanctuary for the maestro, whose bust now adorns the façade, aligned with the very windows of the suite where he died on August 2, 1945. Within these walls, Mascagni composed his final opera, *Nerone*, in 1933—a testament to the enduring creative spirit that permeates this iconic Roman residence.

WOMEN IN ENGINEERING AND YOUNG PROFESSIONALS
Technical Meeting and Reception

REGISTRATION FEES

Full Registration Includes: Presentation and publication of up to 2 papers, admission to technical sessions, welcome reception, gala dinner, coffee break, electronic proceedings.

Student Registration Includes: Presentation and publication of up to 1 paper, admission to technical sessions, welcome reception, coffee break, electronic proceedings.

One Day Registration Includes: Admission to technical sessions, coffee break, electronic proceedings.

WPT School/Workshop/Tutorial Registration Includes: Admission to WPT School sessions, admission to workshop and tutorial sessions coffee break, electronic notes (25% off for registered participants).

Guest Registration Includes: Coffee break, welcome reception.

REGISTRATION FEES		Early Bird Rate Until Tuesday, April 15, 2025	Regular Rate From Wednesday, April 16, 2025 to Tuesday, May 27, 2025	On Site Rate From Tuesday, June 3, 2025 to Friday June 6, 2025
Full Registration	Non Member	730 USD	780 USD	810 USD
	IEEE Member	680 USD	730 USD	760 USD
	IEEE Society Member (PELS & MTTS)	630 USD	680 USD	710 USD
	IEEE Life Member	315 USD	350 USD	390 USD
Student Registration	Student Non Member	350 USD	390 USD	430 USD
	IEEE Student Member	330 USD	365 USD	410 USD
	IEEE Society Student Member (PELS & MTTS)	315 USD	350 USD	390 USD
One day Registration		300 USD	330 USD	350 USD
WPT School / Workshop / Tutorial		240 USD	260 USD	270 USD
Companion/Guest registration		90 USD	100 USD	110 USD

ADDITIONAL ITEMS	Early Bird Rate Until Tuesday, April 15, 2025	Regular Rate From Wednesday, April 16, 2025
Lunch Box	18 USD	18 USD
Additional Gala Dinner Ticket	140 USD	150 USD
Additional Reception Ticket	70 USD	90 USD

FUNDING OPPORTUNITIES

PhD Students Initiative Program & Student Travel Grants

The conference hosts several exciting student programs including the **PhD Student Initiative**, sponsored by the Microwave Theory and Technology society (https://mtt.org/) and the **Student Travel Grants** sponsored by the Power Electronics society (https://www.ieee-pels.org/).

PhD Students Initiative Program

The plan of the PhD Student Initiative Program (SIP) is to support **30** PhD students from Universities worldwide who wish to participate in the conference.

The main goal of the Initiative is to support doctoral candidates working in wireless-power-technology related research areas and to expose them to conference contents that may inspire them to produce high-quality research work and specialize in this field. Provided that there is a sufficient number of applicants, 30 awards will be given to the PhD students from universities at locations worldwide. **The awards will cover the conference and/or school registration fee**. The number of entries from each affiliation would be limited in order to diversify the overall program, i.e., each research group/educational institution may submit up to 3 applications.

All applicants must send the **SIP-Application Form** and their **CVs** to all the Initiative Organizers (see the e-mails below) together **with a recommendation letter from their supervisor** by the **10th of April 2025**.

To qualify for an award:

- All applicants must be **IEEE Student Members** at the time of the application submission.
- Past PhD students awarded with the IEEE WPTCE PhD Student Initiative are not eligible.
- The recipients of MTT-S Fellowships/Scholarships are not eligible.
- It is not mandatory for the recipient to present a paper.
- Successful applicants must be present **in person** at the WPTCE 2025.

Deliverables:

- The award winners should act as volunteer for at least one day during the conference helping in the management of the conference room and should present a poster showing their current PhD research work during the Conference.

Application Form

Local Organizing Committee Members who will be responsible for the PhD Student Initiative:

Valentina Palazzi (valentina.palazzi@unipg.it),

Alessandra Costanzo (alessandra.costanzo@unibo.it),

Nunzia Fontana (nunzia.fontana@unipi.it).

Student Travel Grants

These travel grants aim to increase student participation at IEEE conferences and workshops sponsored by PELS.

The Student Travel Grant (STG) plan is to support 10 PhD students from universities around the world who wish to attend the conference by providing financial support of $1,000.00.

The purpose of the student travel grant is to provide funds to those who may not normally be able to attend.

All applicants must send the ***STG–Application Form*** and their **CVs** to all the Initiative Organizers (see the e-mails below) together **with a recommendation letter from their supervisor** by the **10th of April 2025**.

Requirements for eligibility:

Applicants must meet the following criteria:

- Geographical Priority: Preference will be given to applicants from distant countries and developing nations.
- Authorship Requirement: The applicant must be the author or co-author of an accepted paper.
- Review Score: The submitted paper must have received a very positive evaluation in the peer-review process.
- Institutional Representation: Priority will be given to applicants who are the sole representative of their institution at the conference.
- Career Stage: Applicants must be early-career researchers (e.g., PhD students, postdoctoral fellows, or young faculty members).
- Financial Need: Preference may be given to applicants demonstrating a clear need for financial assistance.
- First-Time Attendance: Applicants must be attending the WPTCE conference for the first time.

All applications will be carefully reviewed, and decisions from the Local Organizing Committee will be made based on merit, eligibility, and available funding.

The financial support may cover up to a maximum of $1,000.00 and includes:

- Complimentary Registration: Full exemption from the school and/or conference registration fee and/or additional items;
- Reimbursement of documented travel expenses, issued in the participant's name, (payable in EUR or USD).

Local Organizing Committee Members who will be responsible for the Student Travel Grants:

Tommaso Campi (tommaso.campi@uniroma1.it),

Silvano Cruciani (silvano.cruciani@uniroma2.it),

Nunzia Fontana (nunzia.fontana@unipi.it).

INSTRUCTIONS FOR PRESENTERS

General information

At least one author must be registered in order to present the paper for any kind of presentation (oral or poster). **Full Registration** permits presentation and publication of up to **2 papers,** while **Student Registration** permits presentation and publication of up to **1 paper.** Please visit the WPTCE25 website for detailed registration information.

Any presentation should closely reflect the content of the submitted paper.

Oral presentation

1. **Presentation Timing**:
   Each speaker is allocated a total of **18 minutes**, which includes both the presentation and the discussion (Q&A). We recommend planning for approximately **15 minutes** of presentation and **3 minutes** for discussion. Chairs will strictly enforce the time limits to maintain the session schedule.
2. **Presentation Upload**:
   All speakers are required to upload their presentation files **before the start of their session**. Please go to the at least **15 minutes** before your session begins to upload and check your slides. Staff will be available to assist you if needed.
3. **Format Requirements**:
   Presentations should be prepared in **PowerPoint (.pptx)** or **PDF** format. Ensure that your slides are compatible with the conference equipment. If your presentation includes videos or special fonts, please embed them directly into your file.
4. **General Tips**:

- Speak clearly and at a steady pace to accommodate the international audience.
- Focus on key points and avoid overloading slides with too much text.
- Keep track of time during your talk. Session Chairs will give time warnings if necessary.
- Be ready to answer questions during the discussion time following your presentation.

Poster presentation

The posters should be in **A0 format** (84 cm x 120 cm) and vertically oriented

The poster message should be clear and understandable without oral explanation. Please, place the title of your paper and author's names prominently at the top of the poster to allow viewers to identify your paper easily. WPTCE organizers suggest only to clearly show the title (minimum 72 pt) and authors name + affiliation (minimum 48 pt) and to use at least a 24 pt font for the body-text and figure captions.

At least one author must be present near the poster during the poster session to answer questions from attendees.

Each poster will be assigned a dedicated panel at the conference. Please mount your poster well before the scheduled start of your session, and leave it in place until the session concludes. Authors are kindly requested to remove their posters at the end of the day. All necessary materials for mounting the posters will be provided in the Poster Area.

ACCOMODATION

As a major tourist destination, Rome offers a wide range of accommodations, including hotels, B&Bs, and apartments. Popular travel websites such as Booking.com, Expedia.com, Agoda.com, Hotels.com, and Airbnb.com provide the best deals and availability. Since June is peak season, we strongly recommend securing your accommodation as early as possible.

Since June is peak season, we strongly recommend securing your accommodation as early as possible.

Additionally, we have reserved a block of hotel rooms close to the conference venue for minimum 4 nights. For further details, please contact the following agency:

terralto Italia

TERRALTO S.r.l (Italia) – Viale Monte Oppio, 24 – I-00184 Roma

Email: info@terralto.it

c/o Caroline LIEBL

+39 06 89878797 (office) / +39 349 4904671 (mob.)

TOURISTIC TOURS

The official tour program and reservation form for WPTCE 2025 are now available for download. Explore the exclusive guided tours planned for the conference and secure your spot by completing the reservation form. Click below to access the documents and plan your experience in Rome!

Tour 1: St. Peter's Cathedral (3 hours visit) – Tuesday, June 3

Discover the majesty of **St. Peter's Basilica**, the largest Christian church in the world, built on the site of **Nero's Circus** in the 15th century. Designed by **Michelangelo, Bramante, and Bernini**, this architectural masterpiece embodies the grandeur of Baroque art. Inside, admire **Michelangelo's Pietà**, **Canova's Monument to Pope Clement XIII**, **Bernini's Baldachin**, and the stunning **dome designed by Michelangelo**. The tour also includes a visit to the **Vatican Grottoes**, where many popes are buried. Climbing the dome offers breathtaking panoramic views of Rome.

Price: € 42 p.p.

The price includes: 3 hours visit with a private English speaking tour guide, entrance fee St. Peter's Dome with lift till the terraces, headsets

The tour requires a minimum of 15 participants; otherwise, it will be canceled. Tour 1 can be combined with Tour 2.

Meeting point at St. Peter's Square

Tour 2: Vatican Museums (2 hours visit) – Tuesday, June 3

Experience one of the world's greatest art collections at the **Vatican Museums**, home to **12 museums and 5 galleries**. Highlights include the **Sistine Chapel**, where Michelangelo's legendary frescoes—**The Creation of Adam** on the ceiling and **The Last Judgment** on the back wall—adorn the sacred space where popes are elected.

Price: € 58,00 p.p.

The price includes: private English speaking tour guide, entrance fees, headsets The tour requires a minimum of 15 participants; otherwise, it will be canceled. Tour2 can be combined with Tour1.

Meeting point at the entrance of the Vatican Museum

Tour 3: Baroque Rome Walking Tour (3 Hours) – Wednesday, June 4

Immerse yourself in the splendor of **Baroque Rome**, following the artistic rivalry between **Bernini** and **Borromini**, two of the era's most influential architects. Starting from **Piazza Venezia**, make your way to **Piazza di Spagna**, home to Bernini's famous **"Barcaccia" Fountain**. Continue to the magnificent **Trevi Fountain**, built using marble from the ancient **Pantheon**. Discover Borromini's architectural genius at **Sant'Ivo alla Sapienza**, with its unique corkscrew-shaped lantern, and visit **Sant'Agnese in Agone** in **Piazza Navona**, facing Bernini's striking **Fountain of the Four Rivers**.

Price: € 50 p.p.

The price includes: 3 hours walk with a private English speaking tour guide, entrance fee Colosseum, Palatin and Roman Forum, Voxtour headsets
The tour requires a minimum of 15 participants; otherwise, it will be canceled.

Meeting point at the entrance of the Conference venue

Tour 4: Ancient Rome Walking Tour (3 Hours) – Thursday, June 5

Step back in time and explore the wonders of **Ancient Rome**. Begin with a guided visit to the **Colosseum**, the iconic amphitheater known for its gladiatorial contests and wild animal fights. Stroll

through the **Roman Forum**, the bustling center of political, commercial, and social life in ancient times, and ascend the **Palatine Hill**, where emperors built their grand palaces. Admire the **Arch of Constantine** and the **Arch of Titus**, monuments commemorating Rome's military victories. The tour also includes a visit to **Capitoline Hill**, the historic seat of Roman government, and the **Basilica of Santa Maria in Aracoeli**, built atop ancient Roman ruins.

Price: € 50 p.p.

The price includes: 3 hours walk with private English-speaking tour guide, entrance fees to the Colosseum, Palatine Hill, and Roman Forum, Voxtour headsets
The tour requires a minimum of 15 participants; otherwise, it will be canceled.
Meeting point at the entrance of the Conference venue.

Tour 5: Unusual Rome Walking Tour (4 Hours) – Friday, June 6

Discover a different side of Rome with this off-the- beaten-path tour. Stroll through the **Jewish Ghetto**, a historic district with elegant palaces, charming fountains, and a rich cultural heritage. Cross the **Tiber Island**, a natural river island with a fascinating history, and explore **Trastevere**, a picturesque medieval neighborhood known for its narrow streets and lively atmosphere. The tour concludes with a visit to **Villa Farnesina**, an exquisite Renaissance villa famous for its grand gallery and Raphael's breathtaking frescoes on the ceiling.

Price: € 56,00 p.p.

The price includes: 4 hours walk with a private English speaking tour guide, entrance fee Villa Farnesina, Voxtour headsets
The tour requires a minimum of 15 participants; otherwise, it will be canceled.
Meeting point at the Ghetto.

IEEE WPTCE 2026

Halifax, Nova Scotia, Canada

July 6-9, 2026

International Steering Committee

- S. Ahn, N. Carvalho, A. Costanzo, G. Covic, J. Grosinger, S. Hermour, A. Hirata, P. Hu, J. Lin, C. Mi, P. Mitcheson, C. Rim, D. Schreurs, N. Shinohara, D. Tan, C. Tang

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- *Olivier Trescases, The University of Toronto*

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- *Hamed Aly, Dalhousie University, Canada*
- *Fei Lu, Lehigh University, USA*

Finance Chair

- *To be determined*

Editorial Board & Publication Chair

- *To be determined*

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- *Hamed Aly, Dalhousie University*
- *Paul Bailey, Discovery Halifax.*