



2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting

14-19 July 2024 • Florence, Italy



Technical Program

Paper Search

Download Proceedings

Sunday, July 14

Sun, 14 Jul, 08:40 - 17:20

[FD-1: Electromagnetic Metamaterials and Metasurfaces: Modeling and Applications](#)

Tutorial

Affari: Hall 3-A

[FD-2: Wireless Power Transfer: Standards, Theory and Applications](#)

Short Course

Affari: Hall 1-A

[FD-3: Quantum Electromagnetics and Its Applications](#)

Short Course

Affari: Hall 3.1

[HD-1: Antenna Design and Optimization Using Machine Learning](#)

Short Course

Affari: Hall 2.2

[HD-5: Multibeam Antennas and Beamforming Networks](#)

Short Course

Affari: Hall 3.2

[HD-7: Surface Electromagnetics in Antenna Engineering: From EBG to Metasurfaces and Beyond](#)

Short Course

Affari: Hall 2.2

[HD-8: Stand on the Antennas & Propagation Standards](#)

Workshop

Affari: Hall 2-A

[HD-9: Advancing NextGen Wireless Communication: From Phased Array Antenna Verification and Measurement to mmWave Rapid Prototyping and FR2/FR3 Applications](#)

Workshop

Affari: Hall 2.1

Monday, July 15

[and Antenna Arrays for Radio Astronomy and Remote Sensing](#)

[MO-SS.2A: Electromagnetic solutions for advanced and emerging RFID systems](#) **Special Session** Teatrino: 0-18

[MO-SS.3A: Mathematical Advances in Theoretical and Computational Electromagnetics: a Tribute to Prof. Zich - part 1](#) **Celebratory Session** Monumentale: 0-14

[MO-A4.1A: Focused session on "Rays and Beams in EM Theory and Applications"](#) Monumentale: 1-17

[MO-A2.1A: MIMO applications](#) Spadolini: 0-02

[MO-A3.1A: Metasurface and metamaterial absorbers and filters](#) Spadolini: 0-03

[MO-A3.2A: Metasurfaces and metagratings for beam manipulation](#) Spadolini: 1-04

[MO-A5.1A: Remote sensing - I](#) Spadolini: 1-06

[MO-A2.2A: Multi-band Antennas I](#) Spadolini: 1-09

[MO-UB.1A: Devices, Systems, Applications: Part I](#) Spadolini: 1-11

[MO-A2.3A: Millimeter-wave Antennas I](#) Spadolini: 1-12

[MO-A2.4A: Reconfigurable antennas I](#) Spadolini: 1-07

[MO-UB.2A: Innovative Materials and Structures](#) Spadolini: 1-05

[MO-A5.2A: Electromagnetic Inversion and Imaging - I](#) Spadolini: 1-10

[MO-A1.1A: Antenna Measurements I](#) Polveria: 0-13

[MO-A6.1A: Novel Antenna Technology for Dual Applications](#) Monumentale: 0-16

[MO-A4.2A: Finite-Difference Time-Domain methods I](#) Spadolini: 1-08

[MO-A4.3A: Novel Integral Formulations and Impacting Applications](#) Monumentale: 0-15

Mon, 15 Jul, 10:20 - 10:40

Coffee Break

Mon, 15 Jul, 12:20 - 13:40

Buffet Lunch

Mon, 15 Jul, 13:40 - 17:20

<u>MO-SS.1P: Machine-Learning as Applied to EM - Trends, Advances, and Applications</u>	Special Session	Spadolini: 0-01
<u>MO-SS.2P: Multi-Functional Reconfigurable Surfaces for Next-Generation Sensing and Communications</u>	Special Session	Teatrino: 0-18
<u>MO-SS.3P: Mathematical Advances in Theoretical and Computational Electromagnetics: a Tribute to Prof. Zich - part 2</u>	Celebratory Session	Monumentale: 0-14
<u>MO-A6.1P: Focused Session on : Advanced Materials and Manufacturing of Antennas and Microwave Components for Sensing and Communication Applications</u>		Monumentale: 1-17
<u>MO-A2.1P: Celebrating the Start of Construction for the Square Kilometre Array</u>		Spadolini: 0-02
<u>MO-A2.2P: Metasurface/Metamaterial Enhanced Antennas</u>		Spadolini: 0-03
<u>MO-A2.3P: Reconfigurable and Programmable Metasurface Antennas</u>		Spadolini: 1-04
<u>MO-A5.1P: Remote sensing - II</u>		Spadolini: 1-06
<u>MO-A2.4P: Broadband/Ultra-wideband Antennas and Systems I</u>		Spadolini: 1-09
<u>MO-UB.1P: Devices, Systems, Applications: Part II</u>		Spadolini: 1-11
<u>MO-A2.5P: Millimeter-wave Antennas II</u>		Spadolini: 1-12
<u>MO-A2.6P: Reconfigurable antennas II</u>		Spadolini: 1-07
<u>MO-A6.2P: Additive Manufacturing of Antennas and Components</u>		Spadolini: 1-05
<u>MO-A5.2P: Electromagnetic Inversion and Imaging - II</u>		Spadolini: 1-10
<u>MO-A1.1P: Antenna Measurements II</u>		Polveria: 0-13
<u>MO-A6.3P: Antennas on platforms or specialized environments</u>		Monumentale: 0-16

[MO-A4.2P: Fast Integral Equations and Stable Discretizations](#)

Monumentale: 0-15

Mon, 15 Jul, 15:20 - 15:40

Coffee Break

Mon, 15 Jul, 19:00 - 23:00

[Opening Ceremony and Welcome Reception](#)

Cavaniglia

Tuesday, July 16

Tue, 16 Jul, 08:40 - 12:20

[TU-SS.1A: Innovative Antenna Solutions for Next-Gen Non-Terrestrial Networks](#)

Special Session

Spadolini: 0-01

[TU-SS.2A: Advances in Additively Manufactured Dielectric Antennas for Modern Communication and Sensing Systems](#)

Special Session

Teatrino: 0-18

[TU-SS.3A: Celebrating Prof. Constantine A. Balanis' 85th Birthday and Contributions to Antennas and Propagation](#)

Celebratory Session

Monumentale: 0-14

[TU-A6.1A: Focused Session on Next-Generation Antenna Technologies for New Space Satellite Communications and Beyond 5G](#)

Monumentale: 1-17

[TU-A4.1A: Focused Session on New Applications of Characteristic Mode Analysis to Antenna System Design](#)

Spadolini: 0-02

[TU-A2.1A: Metasurface Antenna Synthesis](#)

Spadolini: 0-03

[TU-A3.1A: Guided waves and near-field phenomena in metasurfaces and metamaterials](#)

Spadolini: 1-04

[TU-UC.1A: Machine Learning in Radar, Remote Sensing, and Antennas](#)

Spadolini: 1-06

[TU-A2.2A: Multi-band Antennas II](#)

Spadolini: 1-09

[TU-UB.1A: Devices, Systems, Applications: Part III](#)

Spadolini: 1-11

[TU-A2.3A: Millimeter-wave Antennas III](#)

Spadolini: 1-12

[TU-A6.2A: Machine-Learning as Applied to EM - Trends, Advances, and Applications II](#)

Spadolini: 1-07

[TU-A6.3A: Additive manufacturing antennas for sensing and communications](#)

Spadolini: 1-05

[- III](#)

	TU-A1.1A: Antenna Theory: Part I	Polveria: 0-13
	TU-A1.2A: Antenna Feeds and Matching Circuit I	Monumentale: 0-16
	TU-UB.2A: Computational Electromagnetics, Analysis, and Optimization I	Spadolini: 1-08
	TU-UB.3A: Integral Equation Methods	Monumentale: 0-15
Tue, 16 Jul, 09:20 - 10:05	The research activities of the RaSS Laboratory	Industry Workshop Spadolini Pavilion
Tue, 16 Jul, 09:30 - 12:30	Student Design Contest Judging	Lorenese: 1-03
	Student Paper Competition Judging (Closed to Public)	Cavaniglia
Tue, 16 Jul, 10:00 - 11:00	TUP-A1.1: Microstrip Antennas I	Cavaniglia
	TUP-A1.2: Electrically Small Antennas	Cavaniglia
	TUP-A2.1: Reconfigurable antenna arrays	Cavaniglia
	TUP-A3.1: EM Learning, Teaching and Education	Cavaniglia
	TUP-A4.1: FEM methods I	Cavaniglia
	TUP-A6.1: RFID Antennas	Cavaniglia
	TUP-A6.2: Implantable and Contact Sensors	Cavaniglia
	TUP-A6.3: Vehicular Technologies and Related Antennas	Cavaniglia
	TUP-A6.4: Automotive Antennas and Systems	Cavaniglia
	TUP-UA.1: Antennas and Biological Applications	Cavaniglia
	TUP-UB.1: Compact Antennas for Polarization Control and Reflectarrays	Cavaniglia
	TUP-UK.1: Imaging, Therapeutic and Rehabilitative Applications	Cavaniglia
	TUP-UK.2: Implantable and Ingestible and Wearable Devices	Cavaniglia
Tue, 16 Jul, 10:20 - 10:40	Coffee Break	

[advanced antenna designs including antenna placement, co-site interference, RCS and digital twins](#)

Tue, 16 Jul, 12:20 - 13:40	Buffet Lunch		
Tue, 16 Jul, 13:40 - 17:20	TU-SS.1P: IEEE AP-S Industry Initiative Session: Antennas for Future Communication Networks	Special Session	Spadolini: 0-01
	TU-SS.2P: Quantum Technology Related to Electromagnetics	Special Session	Teatrino: 0-18
	TU-SS.3P: Celebratory Session in Honor of Dr. Arthur D. Yaghjian for his 80th Birthday	Celebratory Session	Monumentale: 0-14
	TU-A1.1P: Focused Session on Non-LTI Electrically Small Antennas		Monumentale: 1-17
	TU-A4.1P: Focused Session on Inverse Design of Antennas, Arrays and Metasurfaces		Spadolini: 0-02
	TU-A2.1P: Reconfigurable Intelligent Surfaces		Spadolini: 0-03
	TU-A3.1P: Metadevices for polarization and reflection control		Spadolini: 1-04
	TU-UC.1P: Localization and Estimation Techniques in Sensing and Communications		Spadolini: 1-06
	TU-A2.2P: Broadband/Ultra-wideband Antennas and Systems II		Spadolini: 1-09
	TU-UB.1P: Devices, Systems, Applications: Part IV		Spadolini: 1-11
	TU-A2.3P: Millimeter-wave Antennas IV		Spadolini: 1-12
	TU-A6.1P: Machine-Learning as Applied to EM - Trends, Advances, and Applications III		Spadolini: 1-07
	TU-A3.2P: Characterization of Materials		Spadolini: 1-05
	TU-A5.1P: Focused session on Physics-assisted learning and optimization techniques for Inverse Problems		Spadolini: 1-10
	TU-A1.2P: Antenna Theory: Part II		Polveria: 0-13
	TU-A1.3P: Antenna Feeds and Matching Circuit II		Monumentale: 0-16

Analysis, and Optimization IITU-A4.2P: Innovative Solutions of Integral equations

Monumentale: 0-15

Model-based system design for active electronically scanned array (AESA) and channel specific impairments

Industry Workshop

Spadolini Pavilion

Tue, 16 Jul, 15:00 - 16:00

TUP-A1.1: Microstrip Antennas I

Cavaniglia

TUP-A1.2: Electrically Small Antennas

Cavaniglia

TUP-A2.1: Reconfigurable antenna arrays

Cavaniglia

TUP-A3.1: EM Learning, Teaching and Education

Cavaniglia

TUP-A4.1: FEM methods I

Cavaniglia

TUP-A6.1: RFID Antennas

Cavaniglia

TUP-A6.2: Implantable and Contact Sensors

Cavaniglia

TUP-A6.3: Vehicular Technologies and Related Antennas

Cavaniglia

TUP-A6.4: Automotive Antennas and Systems

Cavaniglia

TUP-UA.1: Antennas and Biological Applications

Cavaniglia

TUP-UB.1: Compact Antennas for Polarization Control and Reflectarrays

Cavaniglia

TUP-UK.1: Imaging, Therapeutic and Rehabilitative Applications

Cavaniglia

TUP-UK.2: Implantable and Ingestible and Wearable Devices

Cavaniglia

Tue, 16 Jul, 15:20 - 15:40

Coffee Break

Tue, 16 Jul, 15:40 - 16:25

Made in Tuscany vertically integrated solutions for the design and manufacturing of big sized antenna for ground stations: a built-to-spec 5.8m Ø Antenna C-band case study.

Industry Workshop

Spadolini Pavilion

Tue, 16 Jul, 16:00 - 17:00

Student Paper Competition Judging (Public Viewing)

Cavaniglia

Reception

Tue, 16 Jul, 17:45 - 22:30	Young Professionals' Treasure Hunt and Dinner	Teatrino: 0-18
Wednesday, July 17		
Wed, 17 Jul, 07:30 - 08:30	Exhibitors / Sponsors Thank You Breakfast	Lorenese: 1-01
	Student Design Contest	Lorenese: 1-03
Wed, 17 Jul, 08:40 - 10:20	WE-SS.1A: Advancing Connectivity Through Emerging Wireless Technologies Special Session	Spadolini: 0-01
	WE-SS.2A: Advanced Technologies for EMF Exposure Assessment/Prediction/Monitoring Special Session	Teatrino: 0-18
	WE-A2.1A: Radar Systems and Radiators	Monumentale: 0-14
	WE-A1.1A: Novel leaky-wave antennas	Monumentale: 1-17
	WE-A4.1A: Neural network and Machine Learning modelling of electromagnetic field problems	Spadolini: 0-02
	WE-A3.1A: Metasurfaces and metamaterials for novel antenna applications	Spadolini: 0-03
	WE-A2.2A: Space-time and Coding Metasurfaces	Spadolini: 1-04
	WE-A6.1A: Application of Electromagnetic Information Theory in next-generation wireless communication - Part 2	Spadolini: 1-06
	WE-UB.1A: High Frequency and Wideband Antennas	Spadolini: 1-09
	WE-UF.1A: Point-to-Point Propagation Modeling, Measurements and Effects	Spadolini: 1-11
	WE-UA.1A: Microwave to Millimeter-wave Measurements and Techniques	Spadolini: 1-12
	WE-A6.2A: Machine-Learning as Applied to EM - Trends, Advances, and Applications IV	Spadolini: 1-07
	WE-A3.2A: Modelling of electromagnetic materials and structures	Spadolini: 1-05
	WE-UB.2A: Inverse Scattering and Methods to Analyze Complex Structures	Spadolini: 1-10

	<u>WE-A1.3A: Antenna Feeds and Matching Circuit III</u>	Monumentale: 0-16
	<u>WE-A4.2A: High-frequency and asymptotic methods</u>	Spadolini: 1-08
	<u>WE-A3.3A: Theoretical and numerical approaches for electromagnetics</u>	Monumentale: 0-15
	<u>How Combining Measurements and Simulations Leads to Pioneering Advances in Antenna Development</u>	Spadolini Pavilion
	Industry Workshop	
Wed, 17 Jul, 09:40 - 10:40	<u>WEP-A1.1: Small Antenna Modulation and Characterization</u>	Cavaniglia
	<u>WEP-A1.2: Microstrip Antennas II</u>	Cavaniglia
	<u>WEP-A1.3: Printed Antennas and Arrays for Mobile Applications</u>	Cavaniglia
	<u>WEP-A2.1: Millimeter Wave Reflectarrays</u>	Cavaniglia
	<u>WEP-A2.2: Phased Array Antennas I: Applications and Technologies</u>	Cavaniglia
	<u>WEP-A2.3: Recent Advances on Printed Antennas and Integrations I</u>	Cavaniglia
	<u>WEP-A2.4: Wide-Scan Array Antennas</u>	Cavaniglia
	<u>WEP-A5.1: Propagation and scattering in complex and random media</u>	Cavaniglia
	<u>WEP-A6.1: Advances on Antenna Technologies for Biomedical Applications I</u>	Cavaniglia
	<u>WEP-A6.2: Microwaves in Medicine: novel diagnostic and therapeutic applications</u>	Cavaniglia
	Coffee Break	
Wed, 17 Jul, 10:40 - 12:30	<u>Plenary Session</u>	Cavaniglia
Wed, 17 Jul, 12:20 - 13:40	Buffet Lunch	
Wed, 17 Jul, 12:30 - 13:30	AP-S Reviewers Lunch	Ronda: 0-01
Wed, 17 Jul, 13:40 - 17:20	<u>WE-SS.1P: New Development in</u>	Spadolini: 0-01
	Special Session	

<u>WE-SS.2P: Advanced Antenna Technology for Civilian and Defence Applications</u>	Special Session	Monumentale: 0-10
<u>WE-SS.3P: Advancements in Antennas, Propagation, and Radio Science: In Memory of W. Ross Stone</u>	Celebratory Session	Monumentale: 0-14
<u>WE-A6.1P: Focused Session on challenges, advances and future trends on emerging applications of radar imaging</u>		Monumentale: 1-17
<u>WE-A5.1P: Focused Session on Non-destructive sensing and imaging: From mm to optical waves</u>		Spadolini: 0-02
<u>WE-A3.1P: Reconfigurable metasurfaces and reflectarrays</u>		Spadolini: 1-04
<u>WE-UC.1P: Advanced Technologies for 5G and Beyond</u>		Spadolini: 1-06
<u>WE-A2.2P: Broadband/Ultra-wideband Antennas and Systems III</u>		Spadolini: 1-09
<u>WE-A5.2P: Experimental and theoretical models for indoor propagation</u>		Spadolini: 1-11
<u>WE-A2.3P: Millimeter-wave Antennas V</u>		Spadolini: 1-12
<u>WE-A6.2P: AI for Antenna Applications</u>		Spadolini: 1-07
<u>WE-A6.3P: Innovative 3D printed antennas and systems</u>		Spadolini: 1-05
<u>WE-A5.3P: Electromagnetic Scattering, Propagation, and Sensing</u>		Spadolini: 1-10
<u>WE-A1.1P: New Antenna Configurations using Slot Structures</u>		Polveria: 0-13
<u>WE-A5.4P: Characterization and suppression of RCS</u>		Monumentale: 0-16
<u>WE-A4.1P: Computational electromagnetics I</u>		Spadolini: 1-08
<u>WE-A4.2P: Integral Formulations for Penetrable Objects</u>		Monumentale: 0-15
<u>WE-A2.1P: Beam-steering Metasurface Antennas</u>		Spadolini: 0-03
<u>Stealth innovation program at the technology innovation institute</u>	Industry Workshop	Spadolini Pavilion

Characterization

<u>WEP-A1.2: Microstrip Antennas II</u>	Cavaniglia
<u>WEP-A1.3: Printed Antennas and Arrays for Mobile Applications</u>	Cavaniglia
<u>WEP-A2.1: Millimeter Wave Reflectarrays</u>	Cavaniglia
<u>WEP-A2.2: Phased Array Antennas I: Applications and Technologies</u>	Cavaniglia
<u>WEP-A2.3: Recent Advances on Printed Antennas and Integrations I</u>	Cavaniglia
<u>WEP-A2.4: Wide-Scan Array Antennas</u>	Cavaniglia
<u>WEP-A5.1: Propagation and scattering in complex and random media</u>	Cavaniglia
<u>WEP-A6.1: Advances on Antenna Technologies for Biomedical Applications I</u>	Cavaniglia
<u>WEP-A6.2: Microwaves in Medicine: novel diagnostic and therapeutic applications</u>	Cavaniglia

Wed, 17 Jul, 15:20 - 15:40

Coffee Break

Wed, 17 Jul, 15:40 - 17:20

[WE-A3.2P: Optically-transparent metasurfaces](#)

Spadolini: 0-03

[From Advanced Research in Antennas, Sensors, Metamaterials, and Numerical Methods for Complex Environments to Real-World Applications: Free Space Overview](#)

Industry Workshop

Spadolini Pavilion

Wed, 17 Jul, 17:30 - 19:00

Awards Ceremony

Cavaniglia

Wed, 17 Jul, 19:30 - 00:30

[Social Dinner](#)

Stazione La Leopolda

Thursday, July 18

Thu, 18 Jul, 08:40 - 10:20

[TH-SS.1A: Application of Electromagnetic Information Theory in next-generation wireless communication](#)

Special Session

Spadolini: 0-01

[TH-SS.2A: Quantum/Atom Based Electric and Magnetic Field Sensors](#)

Special Session

Teatrino: 0-18

Antennas and Systems VI

<u>TH-UD.1A: Antennas and devices for 5G</u>	Monumentale: 1-17
<u>TH-A1.1A: Novel Dielectric Resonator Antenna Structures</u>	Spadolini: 0-02
<u>TH-A2.2A: Controlling Radiation with Metasurfaces and FSSs</u>	Spadolini: 0-03
<u>TH-A3.1A: Absorbers and scattering-control devices based on metamaterials and metasurfaces</u>	Spadolini: 1-04
<u>TH-A6.1A: RF Systems for Wireless Power Transmission</u>	Spadolini: 1-06
<u>TH-UA.1A: Electromagnetic Properties of Materials</u>	Spadolini: 1-09
<u>TH-UF.1A: Microwave Remote Sensing of Planetary Surface and Atmosphere</u>	Spadolini: 1-11
<u>TH-A2.3A: Base Station Antennas</u>	Spadolini: 1-12
<u>TH-A5.1A: Large-scale propagation modeling and characterization</u>	Spadolini: 1-07
<u>TH-A6.2A: Unconventional measurements methods</u>	Spadolini: 1-05
<u>TH-UF.2A: Propagation in complex and random media in the marine environment</u>	Spadolini: 1-10
<u>TH-A1.2A: Novel Substrate Integrated Waveguide and Guided Waveguide Slot Antennas</u>	Polveria: 0-13
<u>TH-A3.2A: Devices for antenna feeds and enhancements</u>	Monumentale: 0-16
<u>TH-A4.1A: Optimization in Antennas design</u>	Spadolini: 1-08
<u>TH-A3.3A: Recent Advances in the Numerical Synthesis of Metasurfaces II</u>	Monumentale: 0-15
IEEE AP-S Past Presidents Panel	75th Anniversary Ronda
<u>Rohde & Schwartz</u>	Industry Workshop Spadolini Pavilion
Thu, 18 Jul, 09:40 - 10:40	
<u>THP-A1.1: Microstrip Antennas III</u>	Cavaniglia
<u>THP-A1.2: Antennas for 5G, 6G, IoT and Special Applications</u>	Cavaniglia
<u>THP-A2.1: Millimeter Wave Reflectarrays 2</u>	Cavaniglia

	THP-A2.3: Reflectarray Analysis Methods		Cavaniglia
	THP-A2.4: Array Synthesis, Analysis and Time-modulated techniques		Cavaniglia
	THP-A2.5: Phased Array Antennas II: Applications and Technologies		Cavaniglia
	THP-A4.1: Parallel and special-processor-based numerical methods		Cavaniglia
	THP-A6.1: Advances on Antenna Technologies for Biomedical Applications II		Cavaniglia
	THP-A6.2: Effects of Electromagnetic Waves in Biomedical Applications		Cavaniglia
	THP-A6.3: THz Antennas and Systems		Cavaniglia
	THP-UA.1: Microwaves in Medicine: systems development and tissue characterization		Cavaniglia
	Coffee Break		
Thu, 18 Jul, 10:40 - 12:20	75th Anniversary Plenary Session	75th Anniversary	Cavaniglia
Thu, 18 Jul, 12:20 - 13:40	75 Years Celebratory Lunch	75th Anniversary	Spadolino Ground Floor
	Buffet Lunch		
Thu, 18 Jul, 13:40 - 17:20	TH-SS.1P: Recent Advances in the Numerical Synthesis of Metasurfaces I	Special Session	Spadolini: 0-01
	TH-SS.2P: Microwaves in Medicine: from emerging trends to pathways for clinical application	Special Session	Teatrino: 0-18
	TH-SS.3P: Understanding our History	Celebratory Session	Monumentale: 0-14
	TH-A2.1P: Focused Session on Physical Layer Technologies for Robust and Secure Communications		Monumentale: 1-17
	TH-A6.1P: Focused Session on New Paradigms in Electromagnetic Identification and sensing		Spadolini: 0-02
	TH-A2.2P: Metasurface Antennas, Sensors and Absorbers		Spadolini: 0-03
	TH-A2.3P: Reconfigurable Intelligent Surfaces		Spadolini: 1-04

Transmission and Harvesting

TH-A2.4P: Broadband/Ultra-wideband Antennas and Systems IV	Spadolini: 1-09
TH-A5.1P: Experimental and theoretical models for outdoor propagation	Spadolini: 1-11
TH-A2.5P: Millimeter-wave/Multiband Antennas	Spadolini: 1-12
TH-A6.3P: Novel Approaches in the Design of Antennas using AI	Spadolini: 1-07
TH-A3.1P: Electromagnetic wave matter interaction	Spadolini: 1-05
TH-A3.2P: Time-Modulated and Frequency-Tunable Electromagnetic Devices	Spadolini: 1-10
TH-UB.1P: Antenna Theory and Design Techniques	Polveria: 0-13
TH-UB.2P: Radar, Electromagnetic Scattering, and Imaging Techniques	Monumentale: 0-16
TH-A4.1P: Hybrid methods I	Spadolini: 1-08
TH-A2.6P: Mutual Coupling Reductions in Antenna Arrays I	Monumentale: 0-15
Intersociety Collaboration Panel	<div style="border: 1px solid gray; border-radius: 10px; padding: 2px 10px; display: inline-block;">75th Anniversary</div> Ronda

Thu, 18 Jul, 14:20 - 16:20

[Dassault](#)

Industry Workshop

Spadolini Pavilion

Thu, 18 Jul, 15:00 - 16:00

[THP-A1.1: Microstrip Antennas III](#)

Cavaniglia

[THP-A1.2: Antennas for 5G, 6G, IoT and Special Applications](#)

Cavaniglia

[THP-A2.1: Millimeter Wave Reflectarrays 2](#)

Cavaniglia

[THP-A2.2: Reflectarray Applications](#)

Cavaniglia

[THP-A2.3: Reflectarray Analysis Methods](#)

Cavaniglia

[THP-A2.4: Array Synthesis, Analysis and Time-modulated techniques](#)

Cavaniglia

[THP-A2.5: Phased Array Antennas II: Applications and Technologies](#)

Cavaniglia

[THP-A4.1: Parallel and special-processor-based numerical methods](#)

Cavaniglia

Biomedical Applications II

[THP-A6.2: Effects of Electromagnetic Waves in Biomedical Applications](#) Cavaniglia

[THP-A6.3: THz Antennas and Systems](#) Cavaniglia

[THP-UA.1: Microwaves in Medicine: systems development and tissue characterization](#) Cavaniglia

Thu, 18 Jul, 15:20 - 15:40 **Coffee Break**

Thu, 18 Jul, 19:30 - 21:30 **IEEE AP-S** 75th Anniversary Palazzo Vecchio, Salone dei Cinquecento
75 Years Gala Dinner

Friday, July 19

Fri, 19 Jul, 08:40 - 12:20 [FR-SS.1A: Beam-Scanning Antennas for Next-Generation Wireless and Satellite Communications at mm-Waves and Beyond](#) Special Session Spadolini: 0-01

[FR-SS.2A: Safety Aspects of Wearable and Implanted Antennas and Sensors](#) Special Session Teatrino: 0-18

[FR-SS.3A: Advancing Electromagnetic Frontiers in Antennas and Propagation: A Centenary Tribute to Leopold B. Felsen](#) Celebratory Session Monumentale: 0-14

[FR-A6.1A: Focused Session on Antennas and Associated Techniques for RF Energy Harvesting and Wireless Power Transfer Systems](#) Monumentale: 1-17

[FR-UB.1A: Focused Session on Antennas for Planetary Exploration](#) Spadolini: 0-02

[FR-A2.1A: Transmitarrays and Transmissive Metasurfaces](#) Spadolini: 0-03

[FR-A3.1A: Advances in Frequency Selective Surfaces](#) Spadolini: 1-04

[FR-UD.1A: Wireless power and sensing](#) Spadolini: 1-06

[FR-UA.1A: EM/EMC Standards and Test Facilities](#) Spadolini: 1-09

[FR-A5.1A: Propagation models for communication systems](#) Spadolini: 1-11

[FR-A2.2A: Antennas for Beam Control](#) Spadolini: 1-12

	FR-A1.1A: Guided-wave Radiation and Application	Spadolini: 1-05
	FR-A5.2A: Scattering models and phenomena -I	Spadolini: 1-10
	FR-A1.2A: Dielectric Resonator Antennas for Communication Applications	Polveria: 0-13
	FR-UB.2A: Propagation Modeling for Applications	Monumentale: 0-16
	FR-UB.3A: Analytical Methods and Complex Media	Spadolini: 1-08
	FR-A2.3A: Mutual Coupling Reductions in Antenna Arrays II	Monumentale: 0-15
Fri, 19 Jul, 10:00 - 11:00	FRP-A1.1: Microstrip Antennas IV	Cavaniglia
	FRP-A2.1: Recent Advances on Printed Antennas and Integrations II	Cavaniglia
	FRP-A2.2: Reduced-Size and Low-Profile Array-Based Antennas	Cavaniglia
	FRP-A2.3: Reflector and Nonstandard Surfaces	Cavaniglia
	FRP-A6.1: Antennas for Implantable and Wearable Medical Applications	Cavaniglia
	FRP-A6.2: Advances on Antenna Technologies for Biomedical Applications III	Cavaniglia
	FRP-A6.3: Antenna Technologies for Biomedical Imaging and Sensing	Cavaniglia
	FRP-A6.4: RFID Antennas and Cognitive Radio Systems	Cavaniglia
	FRP-UB.1: Microstrip Patch Antenna Arrays	Cavaniglia
Fri, 19 Jul, 10:20 - 10:40	Coffee Break	
Fri, 19 Jul, 12:20 - 13:40	Buffet Lunch	
Fri, 19 Jul, 13:40 - 17:20	FR-SS.1P: Intelligent Reflecting Surfaces and Programmable Metasurfaces: Enabling the Future of 5G and 6G Communications	Spadolini: 0-01 Special Session
	FR-A6.1P: Quantum Technology Related to Electromagnetics II	Teatrino: 0-18
	FR-UD.1P: Reconfigurable Antennas and Surfaces for RF Applications	Monumentale: 1-17

<u>FR-A3.1P: Nonlocal, time-modulated, active and analog computing metasurfaces</u>	Spadolini: 0-03
<u>FR-A3.2P: Novel Frequency-Selective Surfaces</u>	Spadolini: 1-04
<u>FR-A6.2P: Wireless Power Transmission and Harvesting Systems</u>	Spadolini: 1-06
<u>FR-A2.1P: Broadband/Ultra-wideband Antennas and Systems V</u>	Spadolini: 1-09
<u>FR-A5.1P: Measurement-based propagation models</u>	Spadolini: 1-11
<u>FR-A2.2P: Modeling and Parametric Studies of Array Antennas</u>	Spadolini: 1-12
<u>FR-A2.3P: Direction Finding, Channel Multiplexing, Frequency Diverse and Time-Modulated Arrays</u>	Spadolini: 1-07
<u>FR-A3.3P: Advances in Waveguides: Theory, Design, and Applications</u>	Spadolini: 1-05
<u>FR-A5.2P: Scattering models and phenomena -II</u>	Spadolini: 1-10
<u>FR-A6.3P: On-Chip Antennas advances for new applications</u>	Polveria: 0-13
<u>FR-UB.1P: Novel Antenna Designs</u>	Monumentale: 0-16
<u>FR-A5.3P: Advances in Ray-Tracing and Emerging Channel Modeling Techniques</u>	Spadolini: 1-08
<u>FR-A2.4P: Mutual Coupling Reductions in Antenna Arrays III</u>	Monumentale: 0-15
<u>FR-SS.2P: The Latest Developments for Automotive Antennas</u>	Monumentale: 0-14

Special Session

Fri, 19 Jul, 15:00 - 16:00

<u>FRP-A1.1: Microstrip Antennas IV</u>	Cavaniglia
<u>FRP-A2.1: Recent Advances on Printed Antennas and Integrations II</u>	Cavaniglia
<u>FRP-A2.2: Reduced-Size and Low-Profile Array-Based Antennas</u>	Cavaniglia
<u>FRP-A2.3: Reflector and Nonstandard Surfaces</u>	Cavaniglia
<u>FRP-A6.1: Antennas for Implantable and Wearable Medical Applications</u>	Cavaniglia
<u>FRP-A6.2: Advances on Antenna Technologies for Biomedical Applications III</u>	Cavaniglia

Fri, 19 Jul, 15:20 - 15:40

Coffee Break

Fri, 19 Jul, 15:40 - 17:20

[FR-A1.1P: Novel Antennas for Modern Applications](#)

Monumentale: 0-14

Fri, 19 Jul, 17:30 - 18:00

Closing Ceremony

Spadolini 0-01

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