



**European
School
of Antennas
and Propagation**

2027

**ESoA
courses**



CONTENT

ESoA Courses 2027:

1		 <i>Rome</i>	<u>LEAKY WAVES AND PERIODIC STRUCTURES FOR ANTENNA APPLICATIONS</u>
2		 <i>Germany</i>	<u>INDUSTRIAL ANTENNA DESIGN</u>
3		 <i>London</i>	<u>BODY CENTRIC WIRELESS COMMUNICATION : from devices, systems to applications</u>
4		 <i>Espoo</i>	<u>ANTENNA MEASUREMENTS FOR MILLIMETER AND SUBMILLIMETER WAVELENGTHS</u>
5		 <i>Siena</i>	<u>ANTENNA SYSTEMS FOR NEXT GENERATION COMMUNICATION (From 5G to 6G).</u>
6		 <i>Genova</i>	<u>MICROWAVE IMAGING AND DIAGNOSTICS</u>
7		 <i>Dubrovnik</i>	<u>ADVANCED MATHEMATICS FOR ANTENNA ANALYSIS</u>

2027

8



Prague

CHARACTERISTIC MODES:
THEORY AND APPLICATIONS

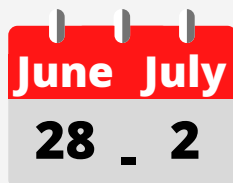
9



Pomezia

ANTENNA MEASUREMENTS

10



Rennes

MILLIMETER WAVE ANTENNAS

11



Istanbul

COMPACT ANTENNAS FOR
SENSOR SYSTEMS

12



Noordwijk

SATELLITE MW REMOTE SENSING:
From the basic techniques to the
end-to-end system design

13



Paris

EXPLOITING SYMMETRIES IN
ARTIFICIAL MATERIALS FOR
ANTENNAS APPLICATIONS

14



Braunschweig

SHORT RANGE RADIO
PROPAGATION: THEORY, MODELS
AND APPLICATIONS

2027

15



ACTIVE ANTENNAS

16



ADVANCED SIGNAL PROCESSING
METHODS FOR
ELECTROMAGNETICS (ASPME).

17



TERAHERTZ ANTENNAS AND
IMAGING SYSTEMS

OBJECTIVES

ESoA was founded in 2004 by a group of institutions in the framework of the FP6 Network of Excellence "ACE" (Antenna Centre of Excellence) and it was afterwards financed in FP7 by a Marie Curie Action (MCA) project till 2007.

From 2008 ESoA is part of EurAAP
(<https://www.euraap.org/>) .

The ESoA courses are distributed in the most accredited research centers on antennas and propagation in Europe.

Reinforcing the European excellence in EM engineering with emphasis on antennas;

Creating an effective advanced formative offer at international level to complete individual PhD curricula;

Increasing the ties in research and development between Universities and Industries on a European scale;

Facilitating the interchange of ideas among early-stage researchers and trainers as well as among young researchers, thus increasing the future mobility and synergy.



ENLARGE
YOUR
NETWORK

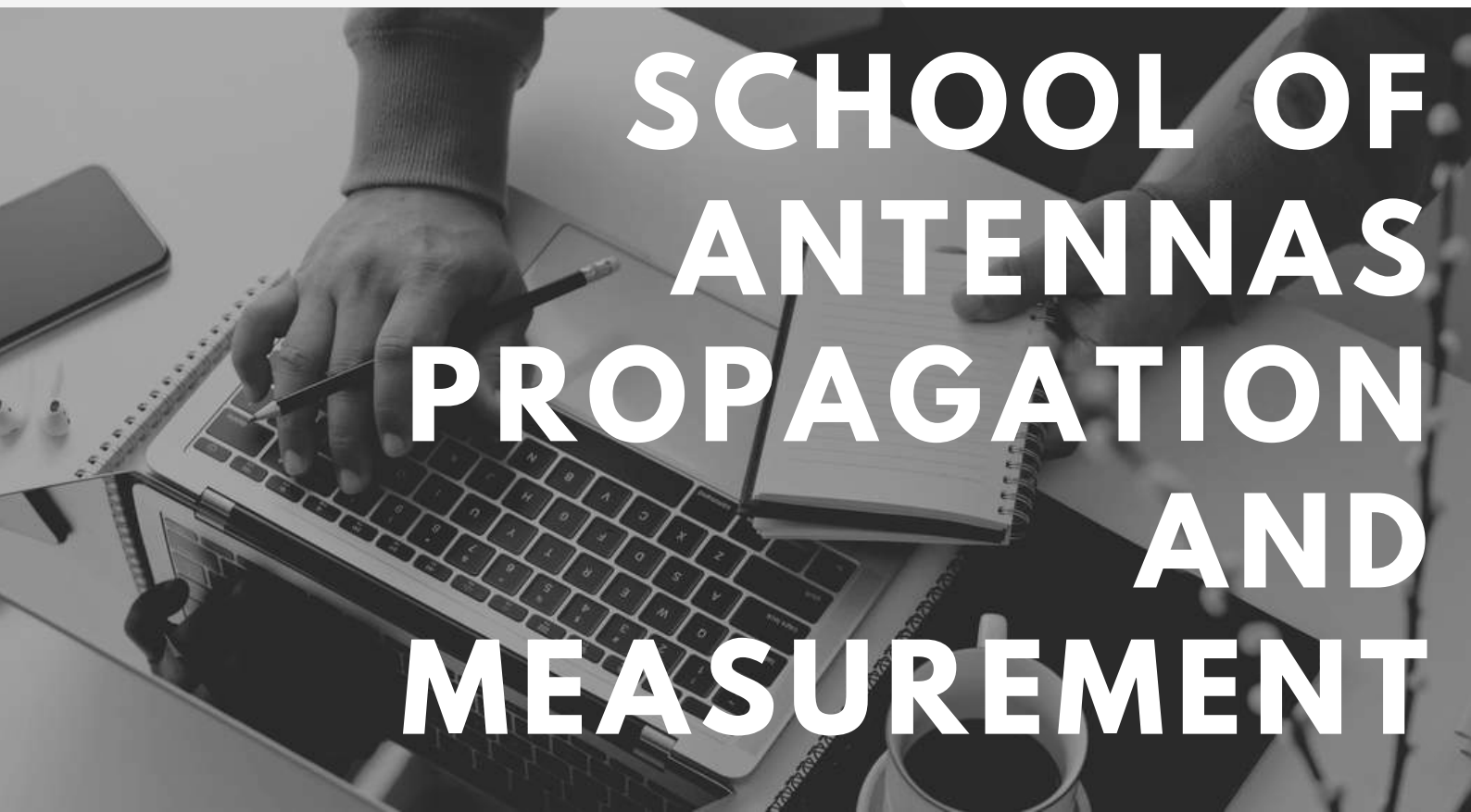
REGISTRATION FEE

The price is the same for all courses.

- 550 € for academia or non-profit institutions
- 1100 € for industry or profit institutions

You will receive a certificate at the end of the course and an invoice with the information of the course for any accounting purpose.

All ESoA courses are conducted in person, and we are delighted to reunite with you face-to-face. Additionally, for certain courses, an online option may be accessible. If you have any inquiries, please don't hesitate to reach out to the respective coordinators.



**SCHOOL OF
ANTENNAS
PROPAGATION
AND
MEASUREMENT**

FEATURES

The most attractive feature of ESoA is the fact that it is geographically distributed, giving the students a unique opportunity to attend courses in the most relevant Scientific Centers of Excellence, and to attend lectures from the best local and visiting instructors.

Simultaneously, the instructors learn from their colleagues different ways to teach. ESoA includes the best 100 teachers in Europe, among which they are seventeen IEEE Fellows, and many other lecturers. ESoA is attended by an average of 220 students per year, with a peak of 450 students in 2023.

The courses are continuously updated and each edition is never equal to the previous one.

ESoA constitute a worldwide unique system of excellence in high-level advanced education. A similar system of excellence is neither known in Europe, nor worldwide.

UNIQUE SYSTEM OF EXCELLENCE

GOVERNANCE



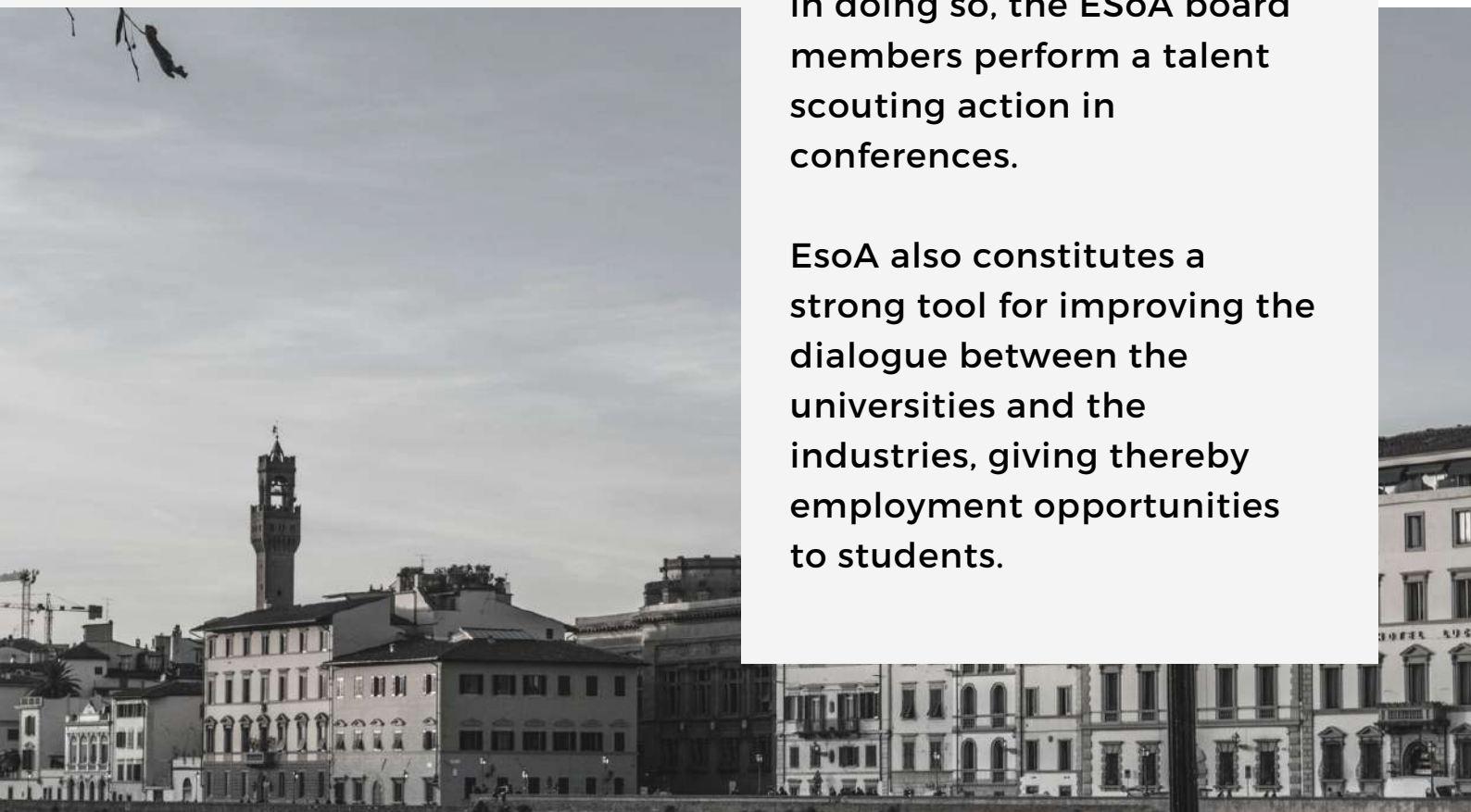
Stefano Maci
European School of
Antennas Chair

The ESoA board is composed by 43 members. These members are from each affiliated institution, who are also coordinators of courses. Moreover, the ESoA board also includes members from European Space Agency (ESA), European Microwave Association (EuMA), the Institute of Engineering and Technology (IET),

IEEE Antennas and Propagation Society (IEEE AP-S) and EurAAP Propagation Working Group.

The ESoA Board meets two or three times per year and gets continuously stimulus to updating the courses and introducing new ones. The coordinators of the courses improve the content of each edition to maintain each course at the state-of-the-art level. Several new junior professors are included in the structure when they reach the right maturity, and in doing so, the ESoA board members perform a talent scouting action in conferences.

EsoA also constitutes a strong tool for improving the dialogue between the universities and the industries, giving thereby employment opportunities to students.





ESoA

A way to excellence



1 LEAKY WAVES AND PERIODIC STRUCTURES FOR ANTENNA APPLICATIONS

April 5-7

Rome, Italy

Coordinators

F. Frezza

Purpose of the course

The Course aims at giving a complete knowledge of the basic physical mechanisms involved, of the various suitable design techniques, and of the possible antenna applications of Leaky Waves and Periodic Structures. Contents of the Course: General features and applications. Fields of a leaky-wave source, leaky waves in open structures. Characterization of leaky-wave antennas: determination of the phase and attenuation constants, relation to the radiation properties. Mechanisms employed to produce leakage: apertures, asymmetries, use of suitable modes. Transverse equivalent networks, aperture admittance, transverse-resonance technique. Periodic Structures. Scanning behavior, phased arrays of leaky-wave line sources, unit-cell approach. Computation of periodic Green's functions. Higher symmetries. Periodically loaded structures. Radiation-pattern shaping, aperture distribution: tapering procedures for leaky-wave antennas. Examples of practical antennas: partially-open metallic waveguides, dielectric structures, printed lines. Feed, losses, manufacture issues. Measurement techniques. Metamaterial and graphene leaky-wave antennas. Antennas exploiting band-gap properties. Inhomogeneous plane waves in dissipative media: deep penetration, total transmission.

Prerequisites

Electromagnetics for graduate students

Course Duration

30 hours in 4 days

Expected speakers

P. Baccarelli

A. Galli

T. Bertuch

D.R. Jackson

P. Burghignoli

J.L. Gómez Tornero

F. Frezza

G. Valerio

2027



2 INDUSTRIAL ANTENNA DESIGN

April 12 - 16

Kamp - Lintfort, Germany

Coordinators

W. Simon, D. Manteuffel

Purpose of the course

The 'Industrial Antenna Design' course covers the essential design criteria for industrial antenna and RF front-end projects. As well as providing a theoretical background, the course will introduce the basics of industrial project management and offer an overview of IP rights and patenting.

The course includes lectures, practical work, and team-based projects, teaching students how to use state-of-the-art electromagnetic software tools, manufacture functional prototypes, and characterize their performance.

As a practical example, the students will design and manufacture mm-wave lenses using 3D printing technology. By the end of the course, attendees will be able to measure, analyze and validate the performance of their own antenna designs against required specifications.

The course equips participants with versatile knowledge and skills that can be readily applied across a wide range of modern industrial applications, such as automotive, communication, industrial sensing, and defence.

Prerequisites

basic radio frequency electromagnetic knowledge

Course Duration

5 days = 32 hours

Expected speakers

Dirk Manteuffel, University Hannover
Abderrahim Moumen, European Patent Office
Winfried Simon, IMST
Simona Bruni, IMST
Marta Arias Campo, IMST
Marta Martinez, IMST
Aline Friedrich, IMST

2027



3 BODY CENTRIC WIRELESS COMMUNICATION: from devices, systems to applications

April 26 - 30

London, UK

Coordinators

Y. Hao, A. Alomainy

Purpose of the course

The course addresses the main issues related to body-centric wireless communications from antennas and radio propagation prospective including measurement techniques, statistical analysis, analytical and numerical studies and system-related aspects of such communication networks.

The course will introduce the current state-of-the-art and potential development in the area including challenges and theoretical limitations of applying conventional concepts at higher frequencies for 5G and beyond including Terahertz bands. Concepts such as diversity antennas, textile electronics, mm-wave systems, wideband communications, etc. will be covered in this course with relation to theoretical and practical aspects.

Prerequisites

Basic knowledge on antennas, electromagnetism and radio propagation

Course Duration

5 days = 25 hours

Expected speakers

John Batchelor, Professor, University of Kent, UK
Maxim Zhadobov, Professor, IETR, France
Hendrik Rogier, Professor, Ghent University, Belgium
Yang Hao, Professor, QMUL, UK
Koichi Ito, Professor, Chiba University, Japan
John Volakis, Professor, Florida Int. Univ., USA

2027



4 ANTENNA MEASUREMENTS FOR MILLIMETER AND SUBMILLIMETER WAVELENGTHS

May 10–14

Espoo, Finland

Coordinators

Z. Taylor

Purpose of the course

- The lectures include the following: (1) mm- and submm-wave instrumentation, (2) near-field scanning, (3) near-field to far-field transformation, (4) compact antenna test range (CATR), (5) CATR realizations based on reflectors, lens, or holograms, (5) quiet-zone testing and antenna testing in a CATR, (6) antenna pattern correction techniques, and (7) testing of small integrated antennas.
- The laboratory demonstrations (exercises) include the following: (1) vector measurements up to 1THz, (2) scanning of near-field – computation of the far-field pattern, (3) antenna measurement in a hologram CATR, (4) elimination of disturbing scatterer effect in a CATR, and (5) on-wafer antenna measurement through reflection coefficient measurement.

Participants have a choice to study a related specific topic prior to the short course, write a brief report, and present that to other participants during the course.

Prerequisites

basics of antennas and microwaves, basic knowledge of electromagnetics and mathematics

Course Duration

5 days

Expected speakers

Zachary Taylor
Ville Viikari
Juha Ala-Laurinaho
Juha Mallat
Aleksi Tamminen
Manuel Sierra Castañer
Thomas Crowe
Sergiy Pivnenko

2027



5 ANTENNA SYSTEMS FOR NEXT GENERATION COMMUNICATION (From 5G to 6G)

May 10-14

Siena, Italy

Coordinators

S. Maci, R. Sauleau, J. Yang

Purpose of the course

The 5G communication technology will bring new experiences including higher bandwidth, higher data rate or greater capacity, security, and lower latency and will create new opportunities for society, businesses. The 5G technologies under development include novel multiple access strategies, ultra-dense networking, all-spectrum access, massive MIMO, full digital beamforming or hybrid beam forming etc. The realization of these high level technologies brings about new challenges for the physical infrastructure designers in which the antennas play a key role.

This course presents the latest research results on 5G antenna systems, where some significant and promising results relevant from industrial perspective are covered. The teaching team includes well-recognized worldwide researchers in academia and industry, covering the area of 5G antenna systems research and developments.

Prerequisites

Basic knowledge on antennas and electromagnetism

Course Duration

5 days = 25 hours

Expected speakers

Jian Yang, Chalmers, Sweden
Antonio Clemente, France
Shuai Zhang, Denmark
Nima jamaly, Switzerland
Roberto Flamini, Italy
Ashraf Zaman, Sweden
Halim Boutayeb, Canada

2027



6 MICROWAVE IMAGING AND DIAGNOSTICS

May 17-22

Reggio Calabria, Italy

Coordinators

**L. Crocco, T. Isernia, A. Massa,
A. Randazzo**

Purpose of the course

The exploitation of electromagnetic field data as a sensing tool paves the way to a number of interesting engineering applications: antenna testing and characterization, biomedical diagnostics, humanitarian demining, archeological prospection, through-the-wall imaging, non-destructive testing of transport infrastructures and buildings, and many others.

This course, after reviewing fundamental equations and main difficulties of inverse problems, will focus on classical and recently introduced solution procedures and algorithms, discussing capabilities, limitations, and perspectives of both approximate and 'exact' reconstruction methods. Applicative examples, including exercises, laboratory activities and lessons regarding specific applications, will corroborate the developed concepts.

Prerequisites

Basics of antennas and microwaves, basic knowledge of electromagnetics and mathematics

Course Duration

5 days = 30 hours

Expected speakers

Lorenzo Crocco
Benjamin Fuchs
Tommaso Isernia
Joe LoVetri
Maokun Li
Andrea Massa

2027



7 ADVANCED MATHEMATICS FOR ANTENNA ANALYSIS

May 24-28

Dubrovnik, Croatia

Coordinators

Z. Sipus, S. Maci

Purpose of the course

The objective of this course is to explain the mathematical methods used in computational antenna analysis and to provide students with mathematical background necessary for advanced antenna engineering and electromagnetic software development. This course can also serve as a mathematical introduction to other ESoA courses. The course will cover different approaches to solving wave equations, various wave representations, and mathematical theorems used to simplify the original electromagnetic problem. In this sense, the aim of this course is to help students gain a deeper understanding of which field representation is suited for a given complex electromagnetic problem.

The topics of the course are:

(1) Fundamental theorems framed in the antenna analysis, (2) Complex analysis, (3) Construction of solutions, (4) Waves: scalar wave equation, (5) Fields: vector wave equation, (6) Asymptotic evaluation of integrals, and (7) Periodic structures.

Prerequisites

No prerequisites needed.

Course Duration

5 days (40 hours)

Expected speakers

Angelo Freni
Stefano Maci
Anja Skrivervik
Giuseppe Vecchi
Zvonimir Sipus

2027



8

CHARACTERISTIC MODES: THEORY AND APPLICATIONS

June 7-11

Prague, Czech Republic

Coordinators

**D. Manteuffel, BK Lau, M.
Ferrando-Bataller, M. Capek**

Purpose of the course

Characteristic mode (CM) theory has received a great deal of attention in the field of antenna engineering in recent years and is one of the best choices to gain thorough physical insight to explain antenna (generally scatterer) operating mechanism. The antenna analysis, based on CM framework, provide a set of characteristic modes which are dependent only on antenna shape, material and frequency, but not on actual feeding. Its attractive features are mainly useful in terms of the designs of small antennas and reconfigurable antenna systems. This course cover both theoretical and practical aspects of the CMs as well as individual work with in-house and commercial software tools.

- www.antennatoolbox.com

Prerequisites

Good knowledge of EM theory

Course Duration

5 days = 30 hours

Expected speakers

Marta Cabedo Fabr s, UP Valencia
Eva Antonino Daviu, UP Valencia
Dirk Manteuffel, Uni Hannover
Buon Kiong Lau, Uni Lund

2027



9 ANTENNA MEASUREMENTS

June 14 - 18

Pomezia, Italy

Coordinators

M. Sierra, L. Foged

Purpose of the course

We are pleased to announce the new edition of the course "Millimeter-Wave Antenna Design and Technologies" scheduled for June 28 through July 2, 2027 in Rennes (France). The first part of the course provides the attendees with an overview of Millimeter Wave Industrial applications, specific antenna Technologies and integrated antennas for millimeter wavelength range.

The second part is devoted to millimeter wave antennas structures to achieve radiation pattern reconfigurability and high efficiency antennas. Special focus are done concerning material Characterization and near Field Imaging, submillimetre wave systems and antennas and also planar and compact beamformers (SIW.), lens antennas and reflect/transmit arrays. The course will be completed by Labs (measurement of antenna radiation patterns in MM Waves, material characterization).

Prerequisites

Basics of antennas and microwaves, basic knowledge of electromagnetics and mathematics

Course Duration

5 days = 30 hours

Expected speakers

M. Himdi

G. Ducournau

C. Karnfelt

D. Ganozalez-Ovejero

F. Foglia Manzillo

R. Sauleau

T.A. Denidni

O. Lafond

J. Schur

2027



10 MILLIMETER WAVE ANTENNAS

June 28 - July 2

Rennes, France

Coordinators

O. Lafond

Purpose of the course

In the framework of the European School of Antennas (ESoA), we are pleased to announce the eighth edition of the course "Millimeter-Wave Antenna Design and Technologies" scheduled from the 26th of June to 30th of June, 2023 in Rennes (France). The first part of the course provides the attendees with an overview of Millimeter Wave Industrial applications, specific antenna Technologies and integrated antennas for millimeter wavelength range.

The second part is devoted to millimeter wave antennas structures to achieve radiation pattern reconfigurability and high efficiency antennas. Special focus are done concerning material Characterization and near Field Imaging and also planar and compact beamformers (SIW..), lens antennas and reflect/transmit arrays. The course will be completed by Labs (measurement of antenna radiation patterns in MM Waves, material characterization..).

Prerequisites

Knowledge of antennas and microwave circuits

Course Duration

5 days = 30 hours

Expected speakers

M. Himdi
C. Karnfelt
L. Marnat
J. Schur
D. Gonzales-Ovejero
G. Ducournau

2027



11

COMPACT ANTENNAS FOR SENSOR SYSTEMS

July 5-9

Istanbul, Turkey

Coordinators

S. Dumanli, D. Nikolayev

Purpose of the course

Wireless small antenna systems for pervasive sensing are becoming a critical part of the growing world of the IoT for applications covering communication and sensing purposes. The course will cover from the modeling and designing principles of compact antennas to the fabrication technologies for communications and sensing applications. Special emphasis will be placed on:

- a) the concepts (radiation principles, dielectric parameters and environment characterization) relevant for the design of electrically compact antennas from microwaves to millimeter-wave,
- b) the fabrication constraints in terms of materials and fabrication (tolerances and techniques, specific antenna environments like biological tissues), and
- c) applications covering wireless small antenna systems for pervasive sensing for the growing world of the IoT, for applications ranging from smart city, urban mobility, new industry or medical care covering the ISM (Industrial, Scientific and Medical) fields. A special emphasis will be given to applications requiring implantable antennas. The participants will design antennas, with different analytical and software tools and assess their directivity, efficiency, and wireless link performance with both experimental and computational methods and a realistic.

Prerequisites

Basic and applied electromagnetics

Course Duration

5 days = 37 hours

Expected speakers

Prof. Luis Jofre

Prof. Anja Skrivervik

Denys Nikolvev

Sema Dumanli

Prof. J. Romeu

Prof. J.M. Rius

Prof. S. Blanc

2027



12

SATELLITE MW REMOTE SENSING – From the basic techniques to the end-to-end system design

July 5-9

Noordwijk, Netherlands

Coordinators

S. D'addio

Purpose of the course

The satellite microwave (MW) remote sensing uses the electromagnetic spectral domain from the medium radio-frequency to the sub-millimeter-wavelength region. MW sensors on board the low-Earth-orbiting meteorological satellites deliver crucial data for the numerical weather prediction applications. Europe's Copernicus/Sentinel satellites provide operational ocean, land and air quality information services to multitude of institutional and commercial users. Earth science missions address specific questions associated with the bio- and geo-physical Earth system for better understanding the underlying mechanisms leading to the climate change.

This is a practice-oriented course aimed at introducing the participants to the design of various MW instruments used for satellite-based Earth observations. It also covers the design, development and operations of a complete satellite system for them to gain an understanding of the overall end-to-end process and of strong inter-dependencies between the payload and the system, all driven by corresponding mission objectives

Prerequisites

Basic knowledge of electromagnetic theory and microwave engineering

Course Duration

4,5 days = 35 hours

Expected speakers

Chung-Chi Lin
Salvatore D'Addio
Alberto Tobias
Michel Tossaint
Nicolas Floury
Maarten van der Vorst

2027



13

EXPLOITING SYMMETRIES IN ARTIFICIAL MATERIALS FOR ANTENNAS APPLICATIONS

September 13 - 16

Paris, France

Coordinators

**G. Valerio, E. Martini,
O. Quevedo-Teruel**

Purpose of the course

The course, co-organized with the MSCA Doctoral Network GENIUS, will present the properties of artificial materials exhibiting special symmetries and their applications to antennas and microwave devices.

The topics will cover:

- Theory of glide- and twist-symmetric metamaterials and metasurfaces
- Analytical and computational methods for the analysis of metamaterials (mode matching, circuit models, integral-equation methods)
- Spatio-temporal symmetries (PT and PTD symmetries ...) and topological states
- Applications to lens antennas (wideband flat lenses, compressed lenses, magnetic materials, ...) and to guided-wave applications (EBG for gap waveguides, flanges, filters, matching layers).
- Tutorial with Ansys HFSS to simulate and design glide-symmetric metamaterials for application to lens antennas.

Prerequisites

Wave propagation, basic properties of metamaterials, basic antenna theory

Course Duration

4 days

Expected speakers

Francisco Mesa, Universidad de Sevilla, Spain
Zvonimir Sipus, University of Zagreb, Croatia
Eva Rajo-Iglesias, Universidad Carlos III de Madrid, Spain
Astrid Algaba Brazalez, Polytechnic University of Cartagena, Spain
Simon Horsley, University of Exeter, United Kingdom

2027



14

SHORT RANGE RADIO PROPAGATION: Theory, Models and Applications

Sept. 27 - Oct. 1

Braunschweig, Germany

Coordinators

C. Brennan, T. Kürner

Purpose of the course

The purpose of the course Short Range Propagation: theory, models and applications is to give an overview of propagation theory and channel modelling for medium/short range wireless systems and networks, including millimetre wave and Terahertz radio propagation, as well as aspects related to MIMO and UWB technologies, wireless onbody communication, medical and short range radar applications. Some of the most important present and future applications of short range propagation will be presented and discussed. One hour of interactive exercises and demo will be provided at the end of each teaching day. The course will be held in the Cesenatico Campus of the University of Bologna.

The teachers will be from Technische Universität Braunschweig, University of Bologna, Dublin City University, Karlsruhe Institute of Technology and Université Catholique de Louvain

Prerequisites

No prerequisites needed.

Course Duration

5 days = 34 hours

Expected speakers

Vittorio Degli Esposti
Thomas Kürner
Claude Oestges
Conor Brennan
Werner Wiesbeck

2027



15 ACTIVE ANTENNAS

Sept. 27 - Oct. 1

Noordwijk, Netherlands

Coordinators

G. Toso, P. Angeletti

Purpose of the course

Active Antennas (AAs) combine antennas with active electronic components and are becoming key elements for the development of high performance and flexible communication systems. AAs are expected to play a disruptive role in the development of advanced antenna systems for Onboard and Ground applications including 5G and MIMO. They can be implemented with direct radiating arrays, possibly magnified by reflectors, with lens antennas, etc. Despite their advantages, AAs are extremely complex in terms of design, manufacturing and testing. The course is providing a detailed overview on Design and Technology aspects of AAs. Main topics presented:- AAs Definition and Introduction;- Payload Aspects;- AAs Architectures;- Arrays;- Broadband Arrays;- Multibeam Antennas;- Technology for Transmit Back End;- AAs for Earth Observation;- Beam Forming Network and Digital Beam Forming;- AAs for Receive and Interference Localization;- AAs for Telecommunications;- Emerging MIMO and 5G Applications.

Prerequisites

Basic knowledge on Antennas and Electromagnetism

Course Duration

5 days = 40 hours

Expected speakers

G. Toso,
P. Angeletti,
S. D'Addio,
V. Valenta,
I. Davies,
P. Jankovic.

2027



16 Advanced Signal Processing Methods for Electromagnetics (ASPME)

October 11–15

Trento, Italy

Coordinators

G. Oliveri, T. Isernia

Purpose of the course

Compressive sensing (CS) is an interdisciplinary topic with interplay between applied/pure mathematics and engineering, and whose impact goes far beyond compression and classical signal processing. Whenever acquiring/inverting data/information is difficult, dangerous, or expensive, CS has been used to overcome canonical information acquisition theorems and processes. Such a possibility has been rapidly and successfully exploited in a wide range of practical electromagnetic problems. After reviewing the fundamentals of CS, the course will focus on classical and recently introduced CS paradigms, discussing their capabilities, limitations, and perspectives in antenna design, imaging, non-destructive testing, and sensing and diagnosis applications. The course is targeted to PhD students, Researchers, Scientists, and Engineers who are willing to (a) learn about the basics of CS; (b) enhance their background on CS in Electromagnetics; (c) know about the leading edge on CS algorithms as applied to ill-posed synthesis and inverse problems; (d) take an overview on the applications of CS in academic and industrial frameworks.

Prerequisites

Basics of Electromagnetism and Mat

Course Duration

5 days = 30 hours

Expected speakers

Mats GUSTAFFSON
Yang HAO
Tommaso ISERNIA
Ivan LAHAIE
José MARTINEZ LORENZO
Andrea MASSA
Marco Donald MIGLIORE
Andrea F. MORABITO
Giacomo OLIVERI

2027



17 TERAHERTZ ANTENNAS AND IMAGING SYSTEMS

October 25-29

Delft, Netherlands

Coordinators

A. Neto, N. Llombart, L. Jofre

Purpose of the course

In the cm-wavelength regime, digital signal processing can be used, in connection to ad hoc front end designs, to increase the signal to noise ratios. In the mm and sub-mm wave regimes only analogue antenna techniques can be used to obtain high signal to noise ratios at reasonable costs.

The Tera Hertz Antennas and Imaging Systems course will take place in Delft at the end of October 2022.

The course will discuss the antenna theory and techniques most widely used in the design of imaging systems aimed to operate in the sub-mm wave regime. Examples will consider on going state of the art research in a number of application domains in which sub-mm wave antenna imaging is truly key to the developments: these include space science radiometry, security, medical imaging, no destructive testing, automotive Radars and Telecommunications. The course will involve every day, theoretical lectures as well as exercises in the advanced TU Delft laboratories.

Prerequisites

Basic Electromagnetics and Antenna Theory

Course Duration

5 days = 32 hours

Expected speakers

Prof. Andrea Neto
Prof. Nuria Llombart
Prof. Luis Jofre
Prof. Jochem Baselmans
Prof. Angelo Freni
Dr. Maria Alonso

2027



<https://www.euraap.org/esoa-courses>



<https://www.linkedin.com/company/european-school-of-antennas-and-propagation-esoa>