European School of Antennas and Propagation

2027

ESoA courses

EurAAP

CONTENT

ESoA Courses2027:

1	April 5-7	 Rome	LEAKY WAVES AND PERIODIC STRUCTURES FOR ANTENNA APPLICATIONS
2	April 12-16	 Germany	INDUSTRIAL ANTENNA DESIGN
3	April 26-30	 London	BODY CENTRIC WIRELESS COMMUNICATION : from devices, systems to applications
4	May 10-14	 Espoo	ANTENNA MEASUREMENTS FOR MILLIMETER AND SUBMILLIMETER WAVELENGTHS
5	May 10-14	 Siena	ANTENNA SYSTEMS FOR NEXT GENERATION COMMUNICATION (From 5G to 6G)
6	May 17-22	 Genova	MICROWAVE IMAGING AND DIAGNOSTICS
7	May 24-28	 Dubrovnik	ADVANCED MATHEMATICS FOR ANTENNA ANALYSIS

2027

8	June 7-11	Cambridge	ANTENNAS FOR RADIO TELESCOPES
9	June 7-11	Lund	CHARACTERISTIC MODES: THEORY AND APPLICATIONS
10	June 14-18	Pomezia	ANTENNA MEASUREMENTS
11	June July 28 - 2	Rennes	MILLIMETER WAVE ANTENNAS
12	July 5-9	Istanbul	COMPACT ANTENNAS FOR SENSOR SYSTEMS
13	July 5-9	Noordwijk	SATELLITE MW REMOTE SENSING: From the basic techniques to the end-to-end system design
14	September 6-10	Paris	EXPLOITING SYMMETRIES IN ARTIFICIAL MATERIALS FOR ANTENNAS APPLICATIONS

2027

15	Sept. Oct. 27 - 1	 Braunschweig	SHORT RANGE RADIO PROPAGATION: THEORY, MODELS AND APPLICATIONS
16	Sept. Oct. 27 - 1	 Noordwijk	ACTIVE ANTENNAS
17	October 11-15	 Trento	ADVANCED SIGNAL PROCESSING METHODS FOR ELECTROMAGNETICS (ASPME)
18	October 25-29	 Delft	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

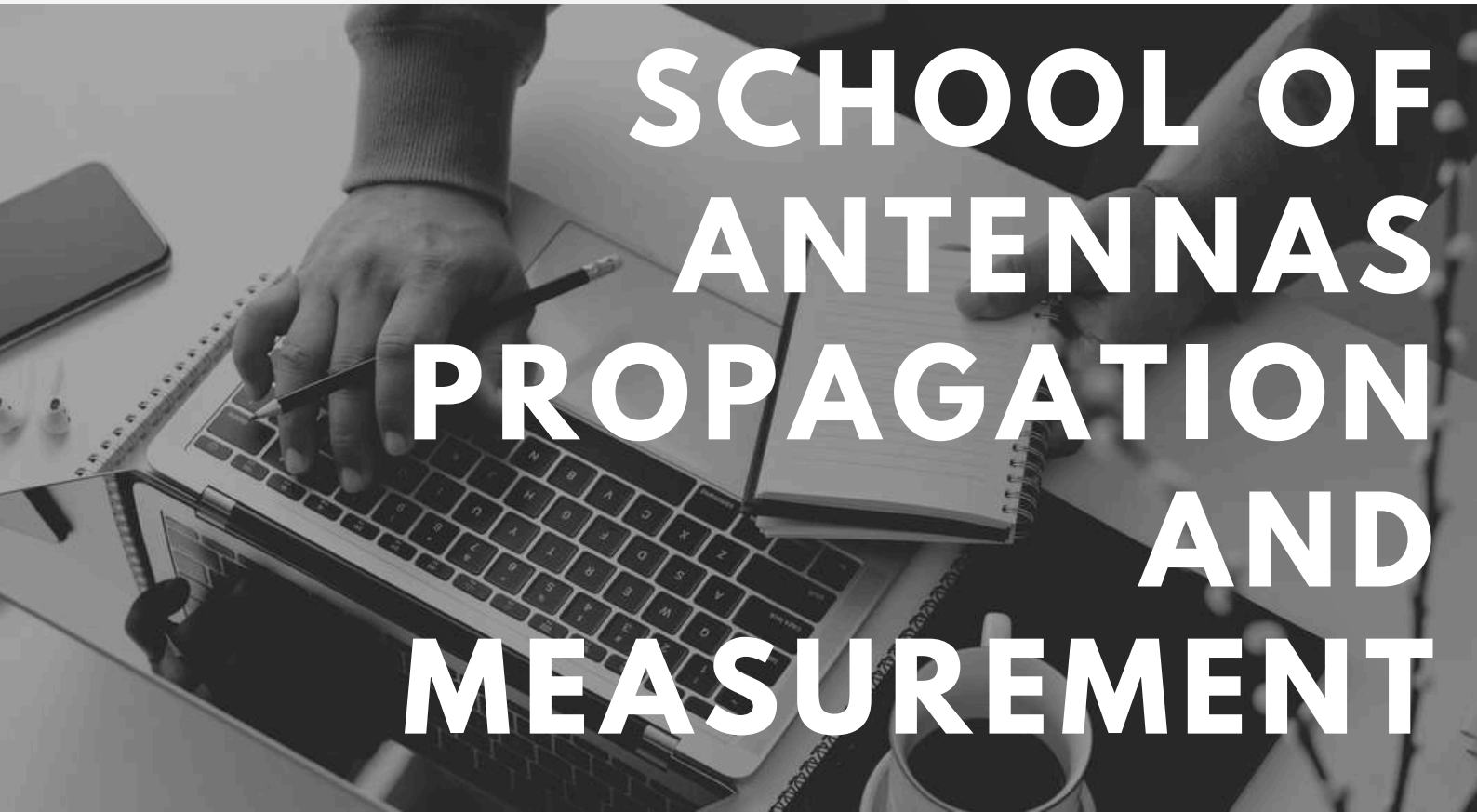
REGISTRATION FEE

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.



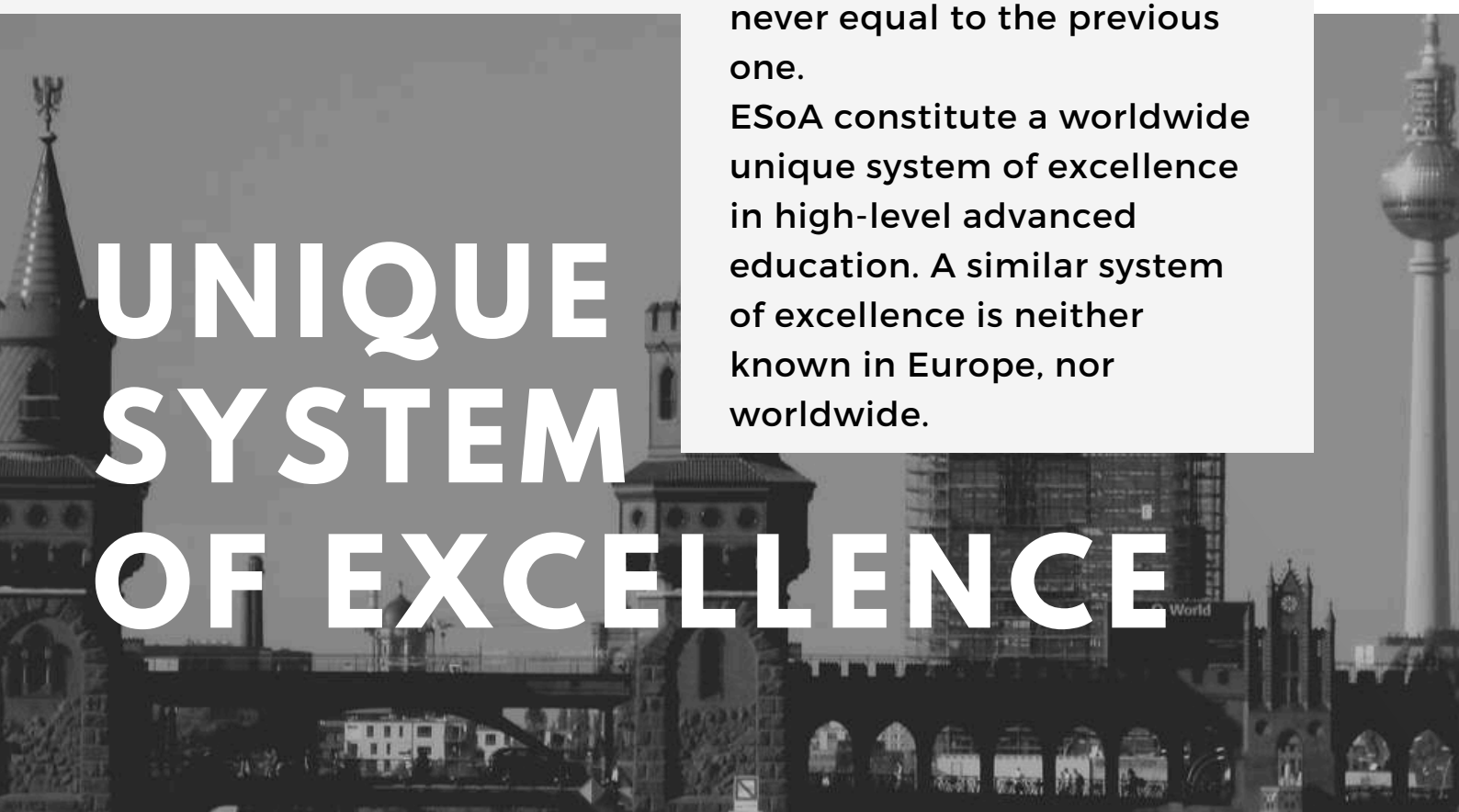
SCHOOL OF ANTENNAS PROPAGATION AND MEASUREMENT

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 Agence (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

European School of Antennas and Propagation

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 T. Bertuch P. Burghignoli F. Frezza A. Galli D.R. Jackson J.L. Gómez Tornero G. Valerio

2027

European School of Antennas and Propagation

2 INDUSTRIAL ANTENNA DESIGN

April 12 - 16 *Kamp - Lintfort, Germany*

Coordinators	**W. Simon, D. Manteuffel**

Purpose of the course

The design of antennas for commercial applications like mobile phones, laptop computers, WLAN mobile devices and antennas for automotive communication and 5G systems is driven by many more issues in addition to the antenna concept. In such industrial projects the antenna design is one part in the whole chain of development. Therefore, the antenna designer has to collaborate with teams from many other disciplines like mechanical design, compliance testing, etc. in order to arrive at a good product. During the design of the product, the antenna designer should be able to anticipate the influence of possible changes in the product specifications and be flexible to adapt his antenna concept to the next design step. Furthermore, the designer has to ensure that his design is reliable and cost efficient. As last point the designer has to present his solution to the customer.

This course on “Industrial Antenna Design” aims to prepare the participants for this kind of work. The course will cover lectures, practical work and team-based project work using state of the art design tools and applications.

This year’s edition of the “Industrial Antenna Design“ course will focus on the design of automotive radar and 5G antennas.

Prerequisites	basic radio frequency electromagnetic knowledge
Course Duration	5 days = 32 hours
Expected speakers	Dirk Manteuffel Marta Martinez Abderrahim Moumen Aline Friedrich Winfried Simon

2027

European School of Antennas and Propagation

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,0Profssor, 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

European School of Antennas and Propagation

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

European School of Antennas and Propagation

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

European School of Antennas and Propagation

6 MICROWAVE IMAGING AND DIAGNOSTICS

May 17-22 *Genova, Italy*

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

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

European School of Antennas and Propagation

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 Zvonimri Sipus

2027

European School of Antennas and Propagation

8 ANTENNAS FOR RADIO TELESCOPES

June 7-11 *Cambridge, UK*

Coordinators	**D. de Villiers, D. Prinsloo, E. de Lera Acedo, O. Zetterstrom**

Purpose of the course

The course will aim to provide a broad and detailed look at the specific challenges facing antenna designers and others working in radio astronomy applications. In addition to topics covering specific antenna technologies used in modern instruments, background on basic radio astronomical methods and performance metrics will be provided, as well as an introduction to some basic calibration and imaging techniques. This should provide the participants with a more detailed and fundamental understanding of what is required from the antenna systems to yield the best possible instruments for different applications.

Prerequisites	No prerequisites needed.
Course Duration	5 days (40 hours)
Expected speakers	D. de Villiers, D. Prinsloo, E. de Lera Acedo, O. Zetterstrom

2027

European School of Antennas and Propagation

9 CHARACTERISTIC MODES: THEORY AND APPLICATIONS

June 7-11 *Lund, Sweden*

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 scaterrer) 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 Fabrés, UP Valencia Eva Antonino Daviu, UP Valencia Dirk Manteuffel, Uni Hannover Buon Kiong Lau, Uni Lund

2027

European School of Antennas and Propagation

10 ANTENNA MEASUREMENTS

June 14 - 18 *Pomezia, Italy*

Coordinators	**M. Sierra, L. Foged**

Purpose of the course

The course offers a comprehensive introduction to the measurement of antennas and antenna systems. It covers classical techniques such as open field testing, compact ranges, and near-field systems, while also exploring the latest advancements in the field. Participants will gain valuable insights into innovative technologies for microwave, millimeter, and submillimeter bands, OTA measurements, MIMO system measurement procedures, and advanced post-processing techniques for enhancing measurement accuracy and diagnosing antenna or measurement system performance. Designed for PhD-level students and engineers in the antenna industry, the course is delivered by leading academic and industry experts, providing unparalleled knowledge of the latest trends and breakthroughs in antenna measurement.

Prerequisites	Basics of antennas and microwaves, basic knowledge of electromagnetics and mathematics
Course Duration	5 days = 30 hours
Expected speakers	Lars J. Foged, Scientific Director MVG Manuel Sierra-Castaner, Prof. UPM Francesco Saccardi, Eng. MVG Olav Breinjberg, Research Consultant, ElMaReCo Sergiy Pivnenko, Technical Director, Asysol

2027

European School of Antennas and Propagation

11 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 materialCharacterization 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

European School of Antennas and Propagation

12 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 constrains 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 asses 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

European School of Antennas and Propagation

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

July 5-9 *Noordwijk, Netherlands*

Coordinators	**Chung-Chi Lin, 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

European School of Antennas and Propagation

14 EXPLOITING SYMMETRIES IN ARTIFICIAL MATERIALS FOR ANTENNAS APPLICATIONS

September 6 - 10 *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	5 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

European School of Antennas and Propagation

15 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

European School of Antennas and Propagation

16 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

European School of Antennas and Propagation

17 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

European School of Antennas and Propagation

18 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

FOLLOW US

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

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