



EUPROMETA – 35th Doctoral School on Metamaterials

Advanced electromagnetic materials and surfaces for novel wave phenomena

Advanced engineered materials and surfaces (e.g. metamaterials and metasurfaces) are making a revolution in many scientific fields (electromagnetics, acoustics, mechanics, etc.) due to the anomalous interaction between electromagnetic/acoustic/mechanical waves and the inherent structure of the artificial materials and surfaces. Such anomalous interaction allows controlling and processing the field in a unique way, opening the door to the design of conceptually new and unprecedented components. In electromagnetics, the new degrees of freedom offered by artificial materials and surfaces allows overcoming some of the issues in silicon electronics, giving rise to a new electronics enabled by the electromagnetic field, extending the concept of *metatronics*, as originally put forward by N. Engheta some years ago. Making material properties reconfigurable and dynamically controllable in space and time, in fact, would open a myriad of new applications and scientific explorations. The course aims at presenting the recent advances in this new branch of electromagnetics, through the lectures given by eminent scientists and experts in the field.

The course is aimed at MS and PhD research students in Physics, Material Science, and Engineering, academic and industrial experts.

Dates	18-22 December 2017
Venue	“Roma Tre” University, Rome, Italy
Credits earned	1.5 ECTS credits
Web	http://school.metamorphose-vi.org
Contact	filiberto.bilotti@uniroma3.it
Poster presentation	Yes
Travel grants	2

CONFIRMED LECTURERS

- Prof. Andrea Alù – University of Texas at Austin, USA
- Prof. Filiberto Bilotti – “Roma Tre” University, Italy
- Prof. Vincenzo Galdi – University of Sannio, Italy
- Prof. Silvio Hrabar – University of Zagreb, Croatia
- Prof. Stefano Maci – University of Siena, Italy
- Prof. Francesco Monticone – Cornell University, USA
- Prof. Carsten Rockstuhl – Karlsruhe Institute of Technology, Germany
- Prof. Mario Silveirinha – University of Lisbon, Portugal
- Prof. Alessandro Toscano – “Roma Tre” University, Italy
- Prof. Sergei Tretyakov – Aalto University, Finland

Registration: Deadline 30 November 2017 http://school.metamorphose-vi.org	Address: “Roma Tre” University – Dept. of Engineering – Via Vito Volterra 62 – 00144 Rome - Italy
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18-22 December 2017 – Rome, Italy

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for novel wave phenomena**

Program of the School

18 December – Monday

09:00-09:55 Participant registration

09:55-10:00 Welcome and opening

10:00-11:00 Lecture 1 - **The past, present, and future of active metamaterials and metasurfaces – Part I**

Prof. Silvio Hrabar – Zagreb University

11:00-11:30 Break

11:30-12:30 Lecture 2 - **The past, present, and future of active metamaterials and metasurfaces – Part II**

Prof. Silvio Hrabar – Zagreb University

12:30-14:30 Lunch

14:30-15:30 Lecture 3 - **Quantifying the T-matrix of a scattering object and exploring advanced material properties with it – Part I**

Prof. Carsten Rockstuhl – Karlsruhe Institute of Technology

15:30-16:00 Break

16:00-17:00 Lecture 4 - **Quantifying the T-matrix of a scattering object and exploring advanced material properties with it – Part II**

Prof. Carsten Rockstuhl – Karlsruhe Institute of Technology

17:00-19:00 Self-study

19 December – Tuesday

09:30-10:30 Lecture 5 - **Nonlocal, non-Hermitian, and multiphysics extensions of coordinate transformation-based design approaches – Part I**

Prof. Vincenzo Galdi – University of Sannio

10:30-11:00 Break

11:00-12:00 Lecture 6 - **Nonlocal, non-Hermitian, and multiphysics extensions of coordinate transformation-based design approaches – Part II**

Prof. Vincenzo Galdi – University of Sannio

12:00-12:30 Assignments

12:30-14:30 Lunch

14:30-15:30 Lecture 7 - **Scattering engineering at the extreme: Anomalies, singularities, and physical bounds in passive and active meta-structures – Part I**

Prof. Francesco Monticone – Cornell University

15:30-16:00 Break

16:00-17:00 Lecture 8 - Scattering engineering at the extreme: Anomalies, singularities, and physical bounds in passive and active meta-structures – Part II

Prof. Francesco Monticone – Cornell University

17:00-19:00 Self-study

20 December – Wednesday

09:30-10:30 Lecture 9 - Non-reciprocal and topological electromagnetics, mechanics and acoustics – Part I

Prof. Andrea Alù – University of Texas at Austin

10:30-11:00 Break

11:00-12:00 Lecture 10 - Non-reciprocal and topological electromagnetics, mechanics and acoustics – Part II

Prof. Andrea Alù – University of Texas at Austin

12:00-13:00 Poster presentation by students

13:00-14:30 Lunch

14:30-15:30 Lecture 11 - “One-way” light propagation: topological and PTD-symmetric photonic platforms – Part I

Prof. Mario Silveirinha – University of Lisbon

15:30-16:00 Break

16:00-17:00 Lecture 12 - “One-way” light propagation: topological and PTD-symmetric photonic platforms – Part II

Prof. Mario Silveirinha – University of Lisbon

17:00-19:00 Self-study

21 December – Thursday

09:30-10:30 Lecture 13 - Materiatronics: Modular approach to understanding and design of metamaterials and metasurfaces – Part I

Prof. Sergei Tretyakov – Aalto University

10:30-11:00 Break

11:00-12:00 Lecture 14 - Materiatronics: Modular approach to understanding and design of metamaterials and metasurfaces – Part II

Prof. Sergei Tretyakov – Aalto University

13:00-14:30 Lunch

14:30-15:30 Lecture 15 - Synthesis-cycle of metasurfaces by flat optics and method of moments – Part I

Prof. Stefano Maci – University of Siena

15:30-16:00 Break

16:00-17:00 Lecture 16 - Synthesis-cycle of metasurfaces by flat optics and method of moments – Part II

Prof. Stefano Maci – University of Siena

22 December – Friday

- 09:30-10:30 Lecture 17 - **Linear and non-linear metasurfaces: From cloaking to enabling smartness in EM components and devices – Part I**
Prof. Filiberto Bilotti – “Roma Tre” University
- 10:30-11:00 Break
- 11:00-12:00 Lecture 18 - **Linear and non-linear metasurfaces: From cloaking to enabling smartness in EM components and devices – Part II**
Prof. Filiberto Bilotti – “Roma Tre” University
- 12:00-13:00 Exams
- 13:00-14:30 Lunch
- 14:30-15:30 Lecture 19 – **Research activities on metamaterials and metasurfaces developed at “Roma Tre” University – Part I**
Prof. Alessandro Toscano – “Roma Tre” University
- 15:30-16:00 Break
- 16:00-17:00 Lecture 20– **Research activities on metamaterials and metasurfaces developed at “Roma Tre” University – Part II**
Prof. Alessandro Toscano – “Roma Tre” University