UNIVERSITÀ POLITECNICA DELLE MARCHE

Dipartimento Ingegneria Informazione

Seminar Announcement

within the Phd Course in Information Engineering

PROBING MATTER WITH SYNCHROTRON RADIATION

Synchrotron radiation sources: 3 Jun 2026 | 10:00–11:30 | Aula 155/2-3
X-rays and matter interaction: 4 Jun 2026 | 10:00–11:30 | Aula 155/5-6
Synchrotron radiation applications 5 Jun: 2026 | 10:00–11:30 | Aula 155/2-3

Dr. LUIGI PAOLASINI

European Synchrotron Radiation Facility, Grenoble, Fr

Abstract: Large-scale accelerator facilities dedicated to the production of intense X-ray beams represent a major experimental resource and a unique opportunity for early-career researchers. This seminar series aims to provide doctoral students with a comprehensive introduction to the theoretical foundations and experimental applications of synchrotron radiation in the study of condensed matter. The program is structured around three main themes: the interaction of X-rays with matter, the physical mechanisms underlying the generation of synchrotron radiation in large-scale facilities such as synchrotrons and free-electron lasers, and the wide range of applications across scientific disciplines. Emphasis will be placed on the operation of electron accelerators and the fundamental physics governing radiation emission by ultra-relativistic electrons. The seminars will also address the core principles of X-ray–matter interactions, including scattering and absorption processes, and will highlight the dual wave–particle nature of radiation. Both classical and quantum theoretical frameworks will be discussed to provide participants with the tools needed to interpret modern experimental results. This series is designed to equip PhD students with a solid background and to foster interdisciplinary understanding of advanced X-ray techniques in contemporary research.

Bio: Luigi Paolasini received in 1991 the Laurea in Electronic Engineering at the University of Ancona, with specialisation in Electronic Communication. From 1992 to 1995 he received a European Commission grant from the Institut for Transuranium Elements of Karlsruhe (Germany) to carry out his PhD work at the Département de Recherche Fondamentale pour la Matière Condensée at the Centre d'Etudes Nucléaires de Grenoble (France). In 1996 he received the PhD in Physics at the University Joseph Fourier in Grenoble. From 1996 to 1998 he worked at Laboratoire Léon Brillouin at the Commissariat à l'Energie Atomique in Saclay (France) as co-responsible of the polarized neutron instrument at the research nuclear reactor Orphée. Since 1998 he has been employed as beamline scientist at the European Synchrotron Radiation Facility in Grenoble, where he was for 10 years beamline responsible of the ID20 magnetic X-ray diffraction beamline. Since 2013, he has been based at the inelastic scattering beamline ID28, dedicated to the study of phonon propagation in materials. His research interests also extend to the acoustics of musical instruments and the construction of string quartet instruments. In addition to his scientific activities, Luigi Paolasini is an Associate Professor at Université Grenoble Alpes and is responsible for the Higher Education and Doctoral Program at ESRF.

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