

Seminars

of the **Physics and Materials** Programme of DSSE in the academic year 2021/2022

Title	Responsible lecturer	Date	Remarks	Learning outcomes	ECTS
Electronic sensors and energy harvesters seminar	Susanne Siebentritt	Monthly	mandatory for candidates of the MASSENA Electronics cluster	-working knowledge on the preparation methods for various semiconductors and polymers -working knowledge on a wide range of characterisation methods for the electronic structure -presentation skills	1
Strain sensors and energy harvesters seminar	Emmanuel Defay	Every two months	mandatory for candidates of the MASSENA Strain cluster	- knowledge on coupled materials such as electrocaloric materials, shape memory alloys and piezoelectric materials - knowledge on liquid crystals - knowledge on the efficiency of thermal machines - presentation skills	1
Biocluster meeting	Sivashankar Krishnamoorthy	Workshop in December	mandatory for candidates of the MASSENA Bio cluster	Achieving deeper understanding of the basic components of a biosensor, the impact of the geometric and physicochemical variables related to the material and the medium on the performance of the biosensor; The figure of merits and benchmarking of the performance of a biosensor, classification of the biosensors based on transduction principles, and the different type of biosensors available in the market;	2
Advanced Photovoltaics seminar	Phillip Dale	Every 6 weeks	mandatory for candidates of PACE	After the seminar you should know more about a particular advanced photovoltaic concept. The presenter should also have gained insight into how to better communicate their work.	1
Semiconductor Growth Methods	Phillip Dale	Planned (dates tba)	mandatory for candidates of PACE	TBA	TBA
Solar cell basics: Thermodynamics	Susanne Siebentritt	September 16 th & 27 th , 2021	MSA 4.500	to obtain a fundamental understanding of the functioning of a solar cell, it's efficiency and its limitations	1

Group theory for condensed matter physics	Mael Guennou	November 18 and 19, 2021	CL BSC- BS 3.03	<ul style="list-style-type: none"> - understand the basic mathematical foundations of group theory required in solid state physics - understand the meaning of symmetry analysis in the literature relevant to their field - perform symmetry analysis of molecular vibrations - use some relevant programs of the Bilbao crystallographic server 	1
Structural and chemical characterization of materials	Santhana Eswara Moorthy Tom Wirtz Inmaculada Peral Alonso Maël Guennou	Oct. 05, 06, 19, 21, 26, Nov. 02, 04, 05 9h-11h	Oct. 5 MSA 4.340 Oct. 6 MSA 4.300 Oct. 19 MSA 3.380 Oct. 21 MSA 3.100 Oct. 26 MSA 3.200 Nov. 2 MSA 4.340 Nov. 4 MSA 4.300 Nov. 5 MSA 4.300 (rooms for 30 or 10 w/ COVID restr.)	The student will learn the principles of physics related to materials characterization using ions, electrons and photons. The skills gained in this course can be applied immediately in the laboratory in a broad range of experimental research in physics, materials science and beyond.	1
Inorganic thin film synthesis methods and underlying principles	Renaud Leturcq Phillip Dale + PhD external expert	Dec. 8, 9h-17h, Jan. 10 13h-17h30, Feb. 2 13h-17h	mandatory for candidates of PACE BS 0.07 CL, MSA 2.400, MSA 4.510	After the workshop the candidates will be able to better read publications and understand the synthesis methods used, have a better appreciation in choosing their own methods, as well as an improved understanding of their own methods.	1
Open Quantum Systems	Matteo Polettini	January 11, 13, 19, 20 2022 10h-13h	11: MSA 3.540 13: MSA 3.540 19: MSA 3.520 20: MSA 3.500	The course is aimed mainly at theorists at Master and PhD level, who would like to get an insight into widely used analytical techniques in condensed-matter systems. The students will get familiarized with the theoretical description of quantum systems interacting with an environment.	1
Basics of Optics	Susanne Siebentritt	January 14 and 20, 2022 9h30-18h	MSA 4.390 MSA 4.500	<p>This is a basics optics course for those who have not had any optics lecture in their bachelor or master studies.</p> <ul style="list-style-type: none"> - propagation of light - geometrical optics: imaging - wave optics: interference and diffraction <p>Learning outcomes: understand lenses, mirrors, slits, gratings, monochromators</p>	1
Field Theory	Thomas Schmidt / Etienne Fodor	May 23-24 2022 9h – 17h	CL BSC 004 (23/5) + BSC 007 (24/5)	Predicting phase transitions for in- and out-of equilibrium theories at hydrodynamic level	1

A hands-on workshop to get structural information from x-ray and neutron diffraction data	Inma Peral	05 May 2022 9h-11h 12 May 2022 9h-11h 19 May 2022 9h-12h	MSA 4.030	To get an understanding on the basics of diffraction, and in particular to know the capabilities in Luxembourg and in Large Scale Research Instruments (that is, neutrons and synchrotrons) To be able to interpret structural information, and experimental diffraction data that can be found in publications, for example. To be able to discuss and design experiments for a specific research project	1
Exoplanets: observation, diversity and habitability	Franck Selsis	23 May 2022 24 May 2022 10h-13h	MSH 0.200 MSA 3.370	The lecture is be dedicated to exoplanets, the methods to detect and characterize them and their atmosphere. We will present their population and what it tells us on planet formation and how generic/specific the solar system is. A second part will focus on terrestrial exoplanets, the expected diversity of their climate and surface conditions. We will question how properties of the host star the orbit, rotation, size and composition of the planet may influence the habitability. In a last part we will address the possibility to remotely search for signs of life on exoplanets by analyzing their atmospheric content.	0.5

More is coming. We will inform you about updates.

Registration and more information is available at [moodle](#).

To log into the system you have to be registered at the UL.