

“Exploiting Symmetries in Artificial Materials for Antenna Applications”

Paris, September 8-11 2025

Co-organized by
the [European School of Antennas](#) and the [GENIUS MSCA Doctoral Network](#),

Coordinators: Guido Valerio, Oscar Quevedo-Teruel, and Enrica Martini
for information, write to: guido.valerio@sorbonne-universite.fr

Trainers:

Guido Valerio, Sorbonne Université, France
Oscar Quevedo-Teruel, Royal Institute of Technology (KTH), Sweden
Enrica Martini, Università di Siena, Italy
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
Amazir MOKNACHE, Ansys



Universidad
Politécnica
de Cartagena

Ansys

Monday 8 September

8:45 - 9:00	Guido Valerio Introduction to the course
9:00 - 10:30	Guido Valerio An Introduction on periodic structures and dispersion analyses in electromagnetics
10:30 - 11:00	<i>Coffee break</i>
11:00 - 12:00	Guido Valerio Spatial symmetries in EM and properties of higher-order symmetries
12:00 - 13:00	Zvonimir Sipus Mode matching approach for the analysis of periodic structures with higher symmetries
13:00 - 14:00	<i>Lunch</i>
14:00 - 15:30	Zvonimir Sipus The Coupled-Wave analysis for the study of higher-periodic and periodic metamaterials
15:30 - 16:00	<i>Coffee break</i>
16:00 - 18:00	HFSS tutorial with Amazir MOKNACHE (Ansys) Study of the dispersive behaviour of a glide-symmetric metamaterial

To be confirmed: Welcome cocktail

Zamansky tower panoramic observation deck, Sorbonne Université

Meeting at 18h30 at the 24th floor (room 2400) of the [Zamansky tower](#).

Tuesday 9 September

9:00 - 11:00	Eva Rajo-Iglesias Gap waveguide technology using higher symmetries
11:00 - 11:30	<i>Coffee break</i>
11:30 - 13:00	Francisco Mesa Multi-modal transfer-matrix methods to compute the dispersion diagrams of periodic structures
13:00 - 14:00	<i>Lunch</i>
14:00 - 15:30	Francisco Mesa Circuit modelling of higher-symmetry periodic structures
15:30 - 16:00	<i>Coffee break</i>
16:00 - 17:00	Simon Horsley Maxwell's equations and symmetry: Group theory in electromagnetism
17:00 - 18:00	Guido Valerio Homogenization of glide-symmetric metamaterials

To be confirmed: Discovery cruise on the Seine: the secrets of Paris

One-hour tour starting at 19:15

Meeting at 19:00 at [Square du Vert Galant, 75001 Paris](#)

Walking distance from the venue (25 minutes) or metro line 7, direction "La Courneuve-8-Mai-1945", stop "Pont Neuf".

Wednesday 10 September

9:00 - 11:00	Simon Horsley What happens when two bands meet? Topology in electromagnetism
11:00 - 11:30	<i>Coffee break</i>
11:30 - 13:00	Oscar Quevedo-Teruel Glide symmetries for lens antennas
13:00 - 14:00	<i>Lunch</i>
14:00 - 15:00	Oscar Quevedo-Teruel Glide symmetries for lens antennas
15:00 - 15:30	<i>Coffee break</i>
15:30 - 18:00	HFSS tutorial with Amazir MOKNACHE (Ansys) Applying the Multi-modal transfer-matrix method to study glide-symmetric metamaterials

To be confirmed: Social dinner at Bouillon Racine

Meeting at 19:20 at [3 rue Racine, 75006, Paris](#)

Walking distance from the venue (15 minutes) or metro line 10, direction “Boulogne”, stop “Cluny La Sorbonne”.

Thursday 11 September

9:00 - 10:30	Enrica Martini Complementarity, duality and symmetry
10:30 - 11:00	<i>Coffee break</i>
11:00 - 13:00	Enrica Martini PTD symmetries
13:00 - 14:00	<i>Lunch</i>
14:00 - 15:30	Astrid Algaba Brazalez Research on Higher Symmetries for next generation communication systems
15:30 - 16:00	<i>Coffee break</i>
16:00 - 17:00	Final exam

How to validate the school: a 1-hour final test will be done on Thursday afternoon on the entire program of the school. The attendance of the entire week is mandatory to validate the school.

European Credits: 5

How to reach Paris

How to buy tickets for public transportation

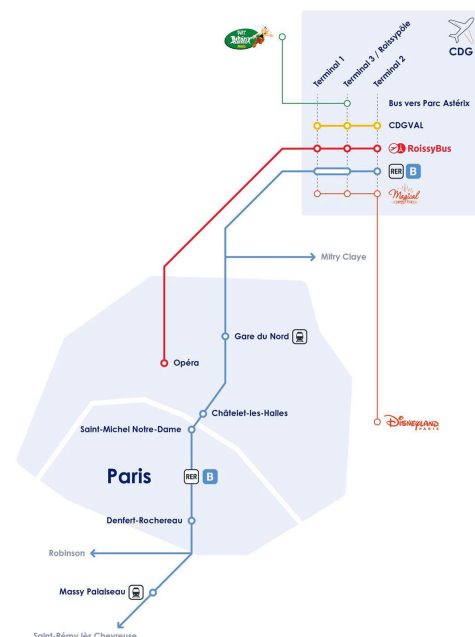
- on your smartphone: <https://www.ratp.fr/en/titres-et-tarifs/smartphone-tickets>
- on a Navigo-Decouverte Travel card: <https://www.iledefrance-mobilites.fr/en/tickets-fares/media/navigo-decouverte-travel-card>

How to use the city bike sharing service

<https://www.velib-metropole.fr/en#/>

From Charles de Gaulle Airport

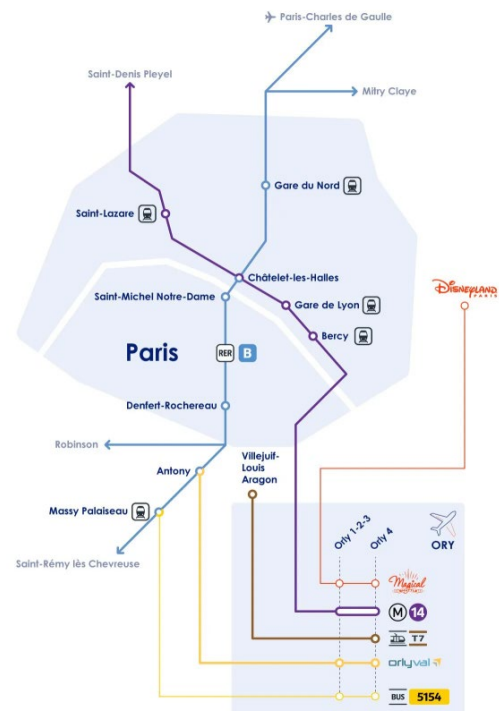
(<https://www.parisaeroport.fr/en/passengers/transport-parking/public-transport-paris/cdg>)



1. Taxi to the left bank (65 €), to the right bank (56 €)
<https://www.parisaeroport.fr/en/passengers/transport-parking/taxi/cdg>
2. RER B to Paris Center (13 €)
 stops in right bank: Gare du Nord, Chatelet-Les Halles
 stops in left bank: Saint-Michel-Notre-Dame, Luxembourg, Port Royal, Denfert-Rochereau, Cité Universitaire
<https://www.parisaeroport.fr/en/passengers/transport-parking/public-transport-paris/rer-b/cdg>
3. RoissyBus to right-bank Opéra (13 €)
 connections to: Opéra métro 3, 7, 8, Auber RER A, Chaussée d'Antin métro 7, 9, Havre-Caumartin métro 3, 9
<https://www.parisaeroport.fr/en/passengers/transport-parking/public-transport-paris/roissybus/cdg>

From Orly Airport

<https://www.parisaeroport.fr/en/passengers/transport-parking/public-transport-paris/ory>



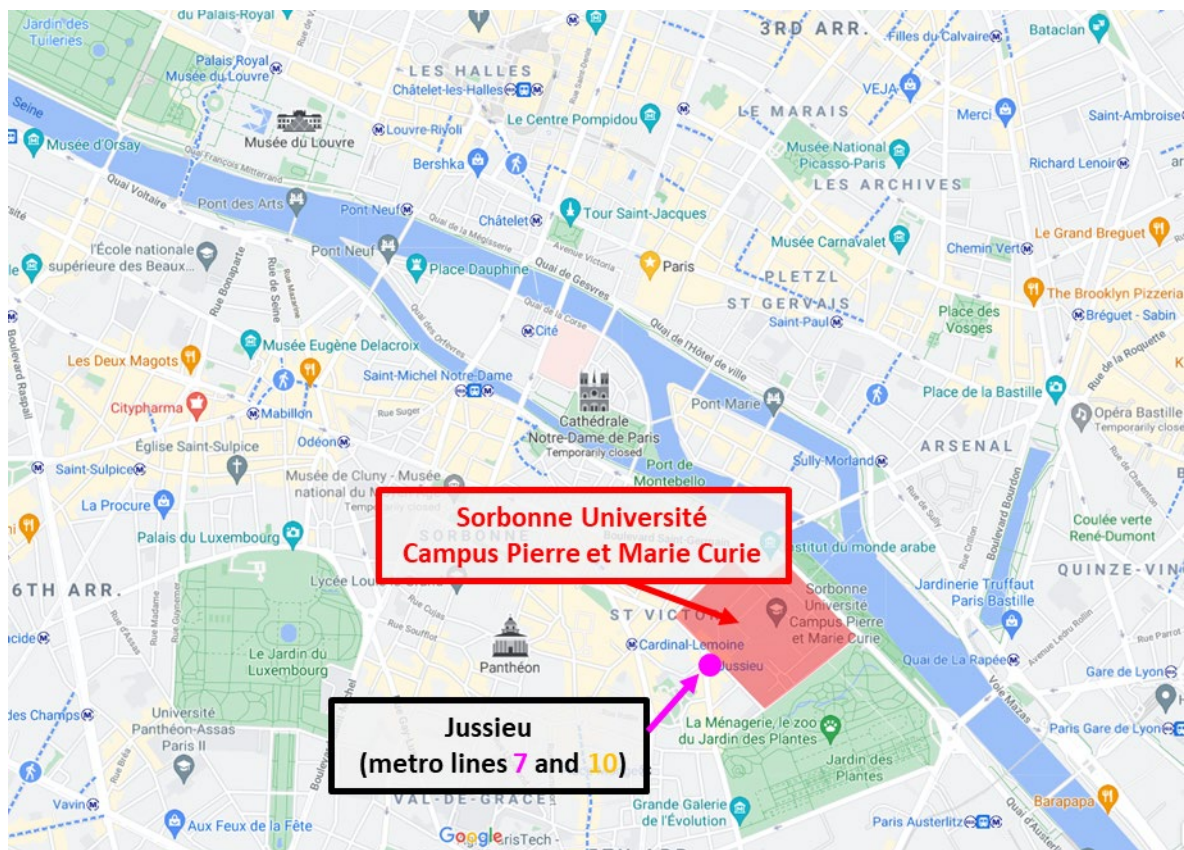
1. Taxi to the left bank (36 €), to the right bank (45 €)
<https://www.parisaeroport.fr/en/passengers/access/paris-ory/taxi>
2. Métro line 14 from Aéroport d'Orly (13 €, and a Navigo Easy pass is required: €2)
 stops in left bank: Maison Blanche, Olympiades, Bibliothèque François Mitterrand.
<https://www.parisaeroport.fr/en/passengers/transport-parking/public-transport-paris/metro-line-14/ory>
3. OrlyVal to Antony station + RER B from Antony station to Paris Center (13 €, and a Navigo Easy pass is required: €2)
 stops in left bank: Cité Universitaire, Denfert-Rochereau, Port Royal, Luxembourg, Saint-Michel-Notre-Dame
 stops in right bank: Chatelet-Les Halles, Gare du Nord
<https://www.parisaeroport.fr/en/passengers/transport-parking/public-transport-paris/rer-b-oryval/ory>
4. Tramway T7 to Villejuif-Louis Aragon + métro line 7 (2 €)
 (cheaper but slower option)
<https://www.parisaeroport.fr/en/passengers/transport-parking/public-transport-paris/tramway/ory>

How to reach the venue

Sorbonne Université, Campus Pierre et Marie Curie

4 place Jussieu 75252, Paris (metro lines 7 and 10, Jussieu)

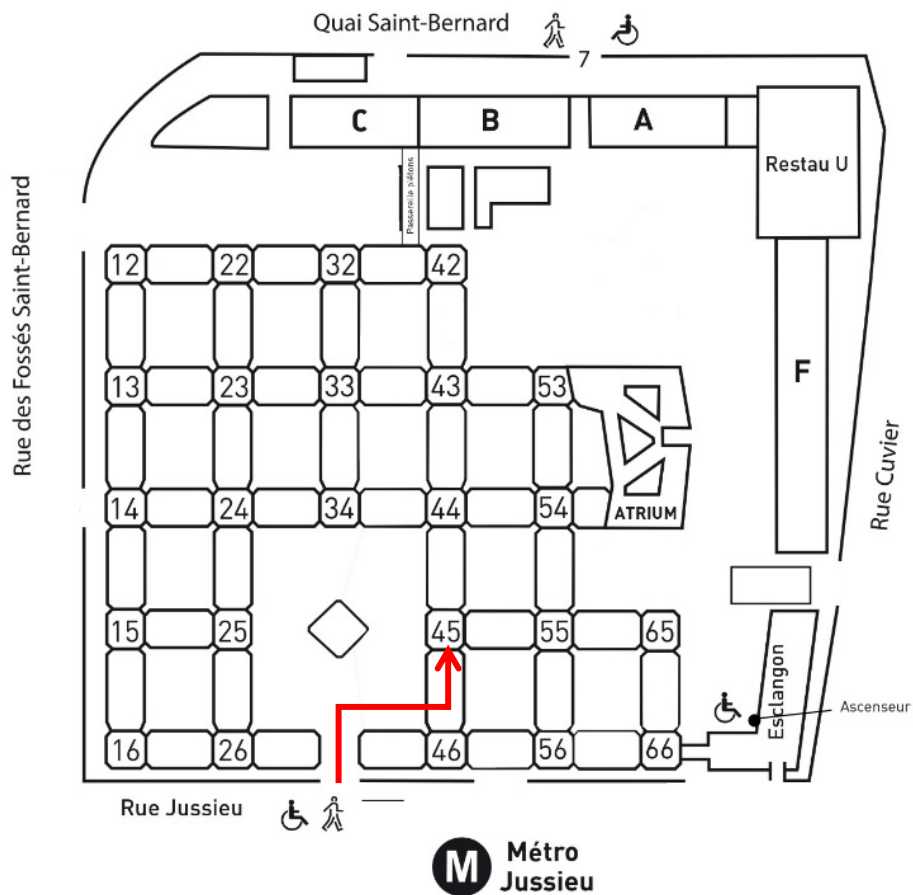
Google Map link: <https://goo.gl/maps/MpU5dXA8wH2HzH5A>



How to reach the room inside the Campus

Between towers 44-45

Room 106, first floor



In Paris beyond ESoA...

The tourist office website is <https://en.parisinfo.com/>

Another website with suggested activities in Paris is <https://quefaire.paris.fr/> (in French).

Here some information on events in Paris taking place in September 2025
<https://parisjetaime.com/eng/article/what-to-do-in-paris-in-september-a1038>

