



ÉCOLE DE
PHYSIQUE DES HOUCHES



Welcome to Les Houches plasma physics school 2019!

**The multiple approaches to plasma physics from
laboratory to astrophysics, May 13-24 2019**

The organizing committee



Benoît Cerutti
(CNRS & Univ. Grenoble Alpes)



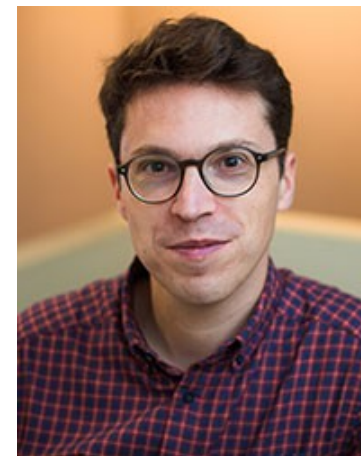
Andrea Ciardi
(Sorbonne Université)



Miho Janvier
(Université Paris-Sud)



Emmanuel d'Humières
(Université de Bordeaux)



Nuno Loureiro (MIT)

24 lecturers

- [Troy Carter](#) (University of California Los Angeles, USA)
- [Benoît Cerutti](#) (CNRS & Université Grenoble Alpes, France)
- [Christopher Chen](#) (Queen Mary University of London, UK)
- [Andrea Ciardi](#) (Sorbonne Université, France)
- [Mickaël Grech](#) (CNRS & Ecole Polytechnique, France)
- [Thomas Grismayer](#) (Instituto de Plasmas e Fusão Nuclear, Portugal)
- [Per Helander](#) (Max-Planck-Institut für Plasmaphysik, Germany)
- [Emmanuel d'Humières](#) (Université de Bordeaux, France)
- [Karine Issautier](#) (CNRS & Observatoire de Paris, France)
- [Miho Janvier](#) (Université Paris-Sud, France)
- [Kumiko Kotera](#) (CNRS & Sorbonne Université, France)
- [Matthew Kunz](#) (Princeton University, USA)
- [Henrik Latter](#) (University of Cambridge, UK)
- [Sergei Lebedev](#) (Imperial College London, UK)
- [Nuno Loureiro](#) (Massachusetts Institute of Technology, USA)
- [Andrea Mignone](#) (Università di Torino, Italy)
- [Paolo Ricci](#) (Ecole polytechnique fédérale de Lausanne, Switzerland)
- [François Rincon](#) (CNRS & Université Paul Sabatier, France)
- [Alexander Schekochihin](#) (University of Oxford, UK)
- [Anatoly Spitkovsky](#) (Princeton University, USA)
- [Hendrik Spruit](#) (Max-Planck-Institut für Astrophysik Garching, Germany)
- [Tommaso Vinci](#) (CNRS & Ecole Polytechnique, France)
- [Philippe Zarka](#) (CNRS & Observatoire de Paris, France)
- [Ellen Zweibel](#) (University of Wisconsin-Madison, USA)

46 participants

From 13 countries (institution of origin) !

Turkey, France, Germany, UK, USA, Poland, Russia, Italy, Portugal, India, Czech Republic, Belgium, Chile.

From many different fields

Space physics, solar physics, astrophysics, plasma devices

But you all have plasma physics in common !

Sorry for bugging you with all these confirmations and proof of travel, we have received so many applications ! (~180)

Our sponsors



GDR LEPICE



We will need your feedback at the end of the school to know how we did and where we can improve.

	Mon. 13	Tue. 14	Wed. 15	Thu. 16	Fri. 17	Sat. 18	Sun. 19	Mon. 20	Tue. 21	Wed. 22	Thu. 23	Fri. 24
07:00						Free week-end	Free week-end					
		Breakfast	Breakfast	Breakfast	Breakfast			Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
08:00												
		Introduction to plasma physics I	Non-ideal MHD phenomena	Numerical methods I: MHD simulations	Collisionless plasmas			Plasma turbulence	High-energy density plasma physics	Magnetic reconnection	Measurement techniques for space plasmas	Measurement techniques for laboratory plasmas II (Low-Energy Density)
09:00												
		Coffee break		Coffee break				Coffee break	Coffee break	Coffee break	Coffee break	
10:00		Introduction to plasma physics II	Coffee break	Numerical methods II: PIC simulations	Coffee break			Coffee break	Measurement techniques for laboratory plasmas I (High-Energy Density)	Coffee break	Observation of Earth & planetary magnetospheres	Coffee break
11:00			Tokamaks & Stellarators		Cosmic rays			Solar wind turbulence		Solar corona & flares		Extreme plasma physics
12:00												
		Lunch	Lunch	Lunch	Lunch			Lunch	Lunch	Lunch	Lunch	Lunch
13:00												
14:00		MHD description	Plasma waves & instabilities	Hands-on	Collisionless shocks			Dynamo	Hands-on	Free afternoon	Hands-on	Farewell
15:00	Arrival to Les Houches											
16:00		Coffee break	Coffee break		Coffee break			Coffee break				
		Techniques for scientific talks	Astrophysical accretion disks		Pulsar magnetospheres			Techniques for paper & proposal writing				
17:00				Coffee break					Coffee break		Coffee break	
			Flash poster	Oral contribution	Journal club			Flash poster	Journal club		Oral contributions	
18:00			Poster					Poster				
19:00	Welcome and practical information	Cocktail										
20:00	Dinner	Dinner	Dinner	Savoyard dinner	Dinner			Dinner	Dinner	Dinner	Savoyard dinner	
21:00											JPP Awards	

Lectures on fundamental topics
1:30 – 2hrs long each

Lectures on advanced topics
1hr long each

3 hands-on sessions
3hrs long each

Sessions led by the students
Talks, posters, journal clubs

Discussions about talks and
proposal writing



Posters

- Find the program and abstracts on the school website
- Session 1 week 1 : Astrophysical plasmas
- Session 2 week 2 : Space & lab plasmas
- Posted in the lobby
- Very wide audience, please adapt your speech!
- 2-minutes flash talks for each poster
- Wine (week 1) and crafts beers (week 2) will be served during the poster sessions so please attend !

Contributed talks

- Find the program and abstracts on the school website
- Session 1 week 1 : Astrophysical plasmas
- Session 2 week 2 : Space & lab plasmas
- 10 minutes talk and 5 minutes of questions
- Very wide audience, please adapt your speech!

The Journal of Plasma Physics Awards



- 4 laureates : first 2 best posters and talks
- Prizes : Plasma physics text books
- Everyone can vote (participants and lecturers)
- 1 vote per person per session

Hands-on session

- Goal : Practice what you have learned in the morning session
- Topics : (i) Plasma simulations (MHD & PIC), (ii) data analysis for space plasmas and (iii) data analysis for laboratory plasmas
- Perform tutorial on your laptop
- Please install all required softwares before each session (see school website).

Journal club

- Goal : Discuss in smaller groups a couple papers selected by the lecturers
- Week 1 : collisionless plasmas, pulsars, laser-plasma interaction.
- Week 2 : plasma turbulence, reconnection, dynamo.
- Please sign-up for a paper from the list provided on the website.

Excursion to Aiguille du Midi (3842m)



- Wednesday afternoon on week 2, departure at 2pm from the school. Return from Chamonix around 6pm.
- If interested, please sign up ! (see google doc)
- It's pretty cold and windy up there, so bring warm clothes !

Some information about the facilities



In this "Cécile DeWitt's building", you'll find:

- The library
- Free access to computers with a copy machine/scan
- 2 kitchens you can use for coffee break
 - Coffee and tea are free. Please **wash your cup/glass/spoon**
 - Cold drinks cost 1€ : please record what you take on the list by your name, and pay for them before leaving at the reception office

Please don't bring any drinks in the lecture room and any cups in your bedroom!

In this "Cécile DeWitt's building", you'll find:



Anny



Murielle



Isabel


- The reception office:
 - To pay registration fee (450€ before Wednesday noon)
 - To buy goodies (sweat-shirts, postcards, cups,...)
 - To get touristic information
 - To pay drinks

Internet

- WiFi : available in each building
EDUROAM or WiFi Campus
Not possible to connect 2 devices at
the same time (computer and phone)
Disconnect properly



The restaurant "Les Balmes"

- Times of meals:
 - Breakfast: from 7:45 to 8:45  **Note: Lectures begin @ 8:45!**
 - Lunch: 12:30
 - Dinner: 19:30
- Restaurant bar, downstairs, below the restaurant:
 - After lunch and dinner, coffee and tea are free
 - Cold drinks : pay directly to the bar
- Lunch box is available: register to the restaurant, the day before, at lunch time
- Special meal on Thursdays (local specialties)

PRACTICAL INFORMATION

The school property is at your disposal for the session; please respect it and if possible improve it.

The last person leaving any room or building should turn the lights off.



Charousse



GARDEN
Our neighbours thank you for keeping this place not too noisy and quiet after 22:30



RESTAURANT

- **Breakfast** : 7:45 → 8:45
- Lunch** : 12:30 pm
- Dinner** : 19:30 pm
- **Picnic** : participants who wish a lunch box instead of a meal should register on the list 24h in advance
- **Drinks** (not included) can be bought on individual basis and paid here

BAR

- Free tea&coffee
- Table tennis, table football, piano, white boards

CARETAKER

- Flat n°9 (3rd floor)
- Phone: +33(0)6 78 98 52 40
(in case of emergency or serious problem only)

RECEPTION

- Information, taxi booking, help, requests, ...
- To be paid : - school fee : 1st day
- cold drink : last day

Direction of Mont Blanc



Mountain activities are at your own risk

Before any hike or climb, please put a note on the special book provided and include the name of the participants, approximate itinerary, schedule and phone number. We draw your attention to the fact we only hold a collective insurance for accidents occurring on the school campus.



Washing Machines
& dryers
Free use
& washing powder



Accommodation

- Rooms:
- No key on the doors but a small safe into every closet
 - Cleaning in the morning
 - In case of emergency : (+33/0)6 789 852 40 (caretaker: Daniel). He leaves at ALPENS 9
 - On the last day: vacate the room by 10:00



Activities



- 5 bikes in the garage, with helmets
- Table-football and table-tennis next to the bar
- Piano and guitar in the bar (keep the noise down to respect the neighbours)

Welcome drink at the bar
tomorrow evening at 19:00

Thank you for your attention

Enjoy your stay
at the *Ecole de Physique des
Houches!*