2018-2019

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NPAC

→ NPAC Master 2 is a joint partnership between 3 universities :

- Paris 6 (Sorbonne Université, Pierre & Marie Curie), « Jussieu Campus » 4 place Jussieu 75005 Paris
- Paris 7 (Denis Diderot) « Condorcet Campus » 10 rue Alice Domon et Léonie Duquet 75013 PARIS
- Paris 11 (Paris-Saclay) « Orsay Campus » (where you are right now)

and the CEA (Commissariat à l'Energie Atomique) through its training institute :

- INSTN, CEA Saclay (Lab. work, Detectors Projects, professors …)

→ The joint partnership (partenariat) means that the 3 universities and the INSTN are providing staff and funding for the master.

→ *This arrangement decides the distribution for students registration in universities :*
2018-2019 : 28 students, 10 in P6, 6 in P7, 12 in P11 + ERASMUS students

→ *While you will be administratively registered in 3 different universities, you are enrolled in the same Master, you will attend the same lectures, exams and jurys, and you will have the same diploma at the end.*

1. NPAC Organization

→ 7 coordinators in NPAC board :

Eli Ben-Haim	**benhaim@lpnhe.in2p3.fr**	**P6 LPNHE**
Delphine Hardin	**hardin@lpnhe.in2p3.fr**	**P6 LPNHE**
Guillaume Patanchon	**patanchon@apc.univ-paris7.fr**	**P7 APC**
Daniele Steer	**steer@apc.univ-paris7.fr**	**P7 APC**
Iolanda Matea	**matea@ipno.in2p3.fr**	**P11 IPN Orsay**
Fabien Cavalier	**cavalier@lal.in2p3.fr**	**P11 LAL**
Wolfram Korten	**w.korten@cea.fr**	**INSTN CEA/SphN**

→ NPAC coordinators are working in various research fields : nuclear physics, particle physics, astroparticle physics, cosmology, theory, either in CEA laboratories or in CNRS labs.

NB :

- IN2P3 ~ Nuclear, Particles, AstroParticles, Cosmology labs @ CNRS – France : LAL, IPNO, CSNSM … (Orsay), APC, LPNHE (Paris), but also in regions : LPSC (Grenoble), LPC (Caen), etc.
- INSU ~ Astrophysics labs @ CNRS – France : IAS (Orsay), IAP (Paris) etc.
- CEA @ Saclay : science labs in particular : Nuclear, Particles, AstroParticles, Cosmology

7 coordinators in NPAC board …….

→**But 1 (V.I.) person for NPAC organisation and NPAC Student Affairs :**

Catherine BOURGE **bourge@lal.in2p3.fr**
LAL laboratory, building 200, office 115.

→ **She is the person to contact for questions concerning the planning, the exams organisation, your marks, …**

→ **Catherine also updates the NPAC web site in (near) real time.**

http://npac.lal.in2p3.fr

TO WHOM SHOULD I TURN ?

→ **For administrative questions concerning your registration, agreements for internship (convention de stage) … :** you must ask the secretariat of the university you are registered in.
e.g. P6 : T23-33 2eme etage Mme Boillevin

If lost, ask one of your university coordinators.
Do not hesitate to ask « native » students for help !

→ **For organisational questions :** ask (and thank !) Catherine

→ **For pedagogical questions (lectures, and also your present and future studies) :** your teacher, one of your university coordinators, but also any coordinators which research field is of interest if this is what your question is about.

ENGLISH

NPAC is taught in English.
→ scholar English, most of us are non native English speaker.

French students :
- You can ask your question in French, and we will answer in both languages.
- You can discuss with teachers in French.

Exams :
- The exam texts are going to be in simple English
- You can write you answers either in French or English.

2. 1st semester planning & general information

4 weeks **September**	Expérimental Project	6 ects	Mandatory
15 weeks **October-end of January**	Quantum Field Theory	6 ects	
	Particles Physics	6 ects	Choose 2 lectures among the 3
	Astroparticles and Cosmology	6 ects	
	From nuclei to stars	6 ects	
	Detector physics	3 ects	
	General relativity	3 ects	choose 1 lecture among the 2
	Accelerator Physics	3 ects	
4 weeks **Mid February-Mid-March**	1 advanced lecture (2 weeks)	3 ects	
	Computing course and project)	3 ects	
14 weeks **Mi March**	Internship	24 ects	

2.1 1st semester planning :

SEPTEMBER : one month of **Laboratory Work**

TL : **Travaux de Laboratoire**

- Iolanda & Marine are managing the TL.
- information session this afternoon at 2:00 PM

It will be followed by a radioprotection and safety course

- the TL mark is equivalent to that of any other majors in the first semester
- Your regular attendance, is extremely important, along with your punctuality.

Enseignements et enseignants de travaux de laboratoire

Melissa Ridel/Cyril Lachaud

Wilfrid Da Silva

Bomben Marco

Jonathan Biteau

A l'IPN
sous la responsabilité de Iolanda Matea

Maxime Defurne

Marine Vandebrouck

Maxence Vandenbroucke

Pascal Gallais

Mathieu Vivier

A Saclay
sous la responsabilité de Marine Vandebrouck et Maxime Defurne

2.1 1st semester planning :

DETECTION COURSE :

1) 9 detection lectures, here in the DEA room.

- It is quite a strong course, with a lot of information.

→ be prepared to work on your notes after this course, make some summaries, short notes, and of course do not hesitate to ask questions.

- Written exam on November, 7.

2) Lab project

- 4 sessions on Tuesday afternoon, during November & December.
- discover a detector or a detection set up in a laboratory.
- You will write a report + Oral exam, December, 18 & 19

TL+Detection : 9 Ects/30 Ects in the semester
Very Important!

2.1 1st semester planning :

GROUP THEORY :

- series of 3 lectures, here in the DEA room.
- a short introduction to SU(2) and SU(3) to prepare the Nuclear, Particles and QFT lectures
- no exam at the end

PROBALITY & Stat. :

→ see the planning in **late september**

PYTHON Intro. :

To be defined in the planning in **october**

2.1 1st semester planning :

From OCTOBER to JANUARY :

1) 1 mandatory major : QFT
2) choosing 2 out of 3 majors : Particle Physics, Nuclear Physics, Astroparticles & Cosmology
3) choosing 1 out of 2 minors : General Relativity, Accelerator Physics

- In order to make your choice, you will attend the 1st lecture of each major/minor
- **1st lecture in GR mandatory : revising special relativity**

4) At least 3 ½ days without lecture per week **for personal work**

ACCELERATORS/GR LECTURE choice :

- Accelerators *strongly advised* for the students interested in *nuclear or particles physics*

→ choice *the first week of* october ; we shall check there is a balance in the class between the 2 choices.

2.1 1st semester planning :

From OCTOBER to JANUARY :

WHERE ?

In Orsay on Monday, Tuesday, Thursday ; in the DEA room (**your** room)

In P7 on Wednesday morning ;

In P6 on Friday

→ **so that you get to know Paris campus labs : APC (P7), LPNHE (P6), …**

Ask the native students to help you on these campus!

IPN NPAC corridor : NPAC library room (we can buy book on demand), coffee & lunch room, printing & xerox facilities

2.1 1st semester planning :

→ The **planning** is posted on the web and ***updated online***

→ For any modifications, you will be informed by e-mail by Catherine

But always look at the planning on the web !

→ The planning cannot be modified directly with the professors
→ Always ask Catherine for any time modifications
→ Places cannot be modified !!!

2. 2 General Informations

HANDOUTS/LECTURE NOTES (depending on the professors):

- Available on the web
- Kindly photocopied on request by Catherine and available at her office --- you'll have to come and fetch them.

LIBRARIES :

- *NPAC students library* here at IPN-Orsay
- IPN-Orsay laboratory library
- You can also go in the library of the universities Paris 6, 7, Orsay, although you can borrow book only if the library of your university.

2. 2 General Information

PERSONNAL WORK :

- NPAC requires a huge load of personal work

→ 3 ½ days free in the weekly planning + week-end

- This is a transitional year between academic training and research work → work every day !!!

- Any work your professor advices you to do (exercises, complementary reading, …), **do it.**

- Do turn to your teacher for any questions and remarks -- speak and interact with them !!

2. 2 General Informations

EVALUATIONS, EXAMS :

- **Detectors :** Written exam on November, 2nd ; report + Oral exam, December, 19 & 20
- **Accelerators and RG :** exams just after Christmas break
- **Majors**

- **A/C :** the « final » astroparticle exam takes place November, 20 (*1/3rd of the final grade*).
  The « final » Cosmo exam in February, 4 (*2/3rd of the final grade*).
  No mid-term exams.
- **N,P,QFT:**
  - the mid-term exams, mid-November, are in the same conditions of the final exam

  It will account for 25% of the final grade.
  - final exam in February

For all lectures (except TL and Detectors) :

if the obtained grade is <10/20, it is possible to take **an oral exam** BUT the final grade will be at most 10/20 (during the week of March, 4)

2. 2 General Informations

VISITS :

- **GANIL**

- one Saturday November, 24
- mandatory even if you do not attend nuclear lecture

- **CERN :**

- mandatory as well
- 2 days ½ visit : 10/2 → 12/2

3. AFTER NPAC : PhD

3. AFTER NPAC : PhD

A PhD = 1 lab, 1 supervisor, 1 subject, 1 grant, … and 1 Doctoral School

WHAT IS A DOCTORAL SCHOOL (ED = Ecole Doctorale) ?

ED = University Department in charge of PhD students

- Which **ED** ? The <u>future supervisor</u> is affiliated to *one* ED

e.g. : supervisors at LAL laboratory are all affiliated to Pheniics Paris-Saclay ED

- <u>Registration :</u> The **ED** has the final decision* on your acceptation in PhD

→ application file + oral examination

- <u>Funding :</u> in most cases, the ED *provides the PhD grant through a competitive selection :* application file with your grades + oral presentation

<u>During the PhD :</u>

- formation during the PhD
- defense and diploma delivering

* *(even so if you agreed on a subject with a supervisor, and you have a grant !)*

3. AFTER NPAC : PhD

A PhD = 1 lab, 1 supervisor, 1 subject, 1 grant, … and 1 Doctoral School

→ ***Presentation of The Local Doctoral Schools & their Application system & schedule in December :***

- For Orsay (IN2P3) /Saclay (CEA) labs : PHENIICS
- For P6/P7 IN2P3 labs : STEP'UP
- For Paris/Meudon Astrophysics (INSU/CEA) labs : Astronomie et Astrophysique d'Ile de France (ED127)

- NB: students from other French and Foreign Master also apply at these **ED**

3. AFTER NPAC : PhD

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THE GRANT :

The funding can be provided by :

- the French Research Office (« Bourses Ministère ») : competition organized by the **ED**
  input : your grades + oral competition
- your supervisor/supervisor team (e.g. ANR, ERC funding) …
- your lab institute : e.g. « CEA grant », « CNES grant »
- **always a selective process** even for « *funded PhD subject* »

3. AFTER NPAC : PhD

A PhD = 1 lab, 1 supervisor, 1 subject, 1 grant, … and 1 Doctoral School

HOW TO FIND A PHD SUBJECT + SUPERVISOR ?

When : ~ December

1) which field/experience ? (*keep an open mind*)
2) subjects proposals are listed on **EDs** web pages & NPAC pages

Paris Region, but also other Regions, other Countries (Spain, Italy, Germany, etc.)

1) consider the funding chance (to be discussed with the supervisor)
2) you are ~ 30 : try and spread between labs, EDs, and subjects ….
3) PREPARE a Plan B subject : in a ≠ EDs
4) Work hard as good grades & ranking **do** help
5) Ask and listen to the coordinators advice
6) Be realistic (don't apply on a theoretical subject with 11/20 in QFT !)

→ **The internship (21/03 → 19/06) is to be done in your future PhD supervisor team**

→ **numerous meetings with NPAC coordinators in December, January, February to discuss this topic**

Finally : Cafe NPAC

During this semester, we shall meet you regularly for a coffee during the lunch break, to :

- ask if everything is OK
- enquire & discuss your option choices
- answer your questions

Catherine will add these "Meet-The-NPAC-Coordinators" meetings in the planning

As a reminder :

- A lot of work is required
- Do not neglect TL+Detectors == 9 ECTS
- The EDs will be looking thoroughly at you 1st semester grades -- crucial for grant attribution

THANK YOU !

Enjoy this year !

Make friends with NPAC fellow students

Discuss with your professors (all of them are researchers, specialists in their fields)

Visit CERN and GANIL with interest

Find a PhD subject that you will like ….