

Astroparticle theory in France

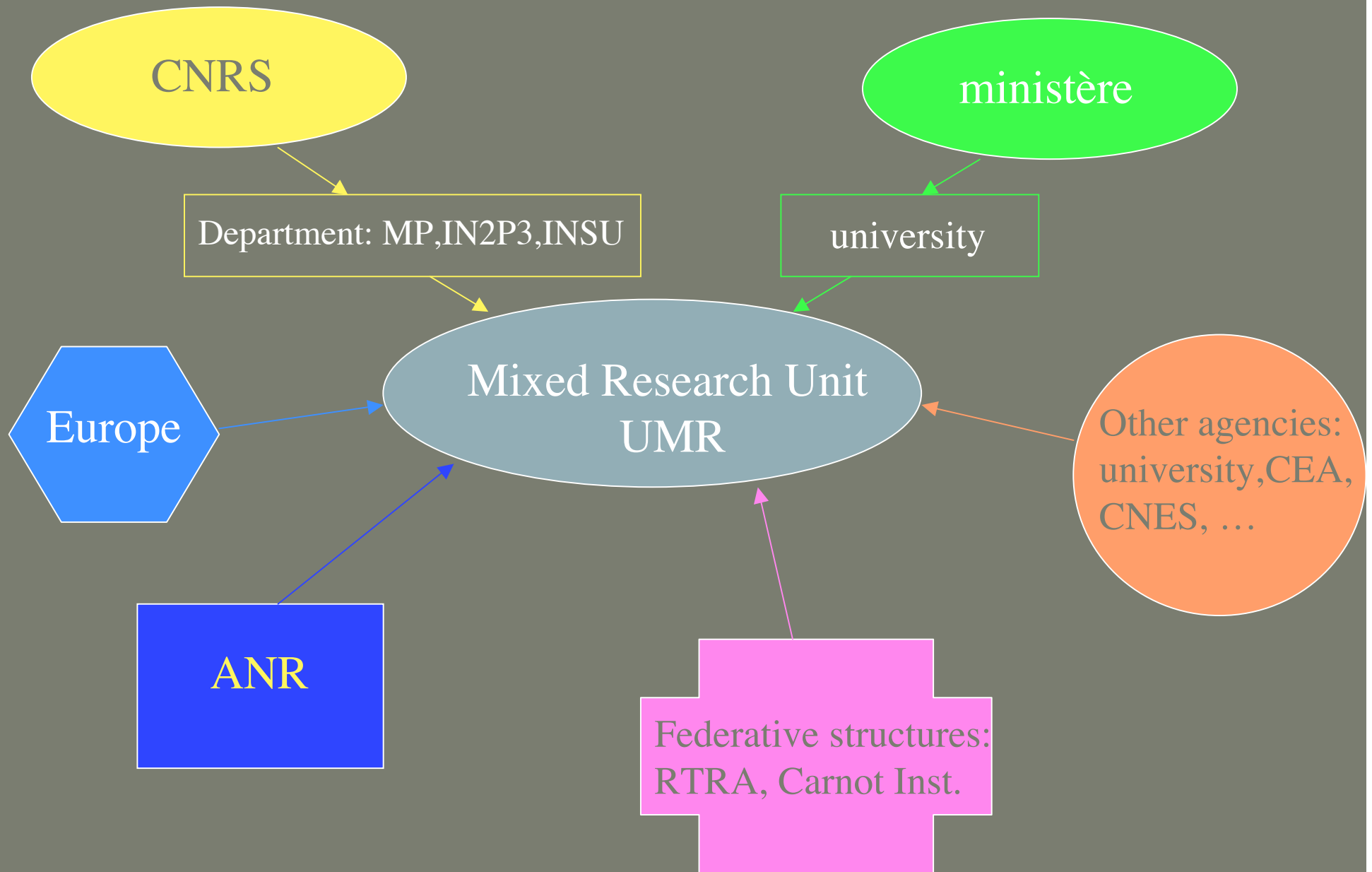
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Two kinds of laboratories:

- general theory labs with an astroparticle physics group:
 - ★ Laboratoire de Physique d'Orsay (4.5)
 - ★ Institut de Physique Théorique de Saclay (5)
 - ★ Laboratoire d'Annecy de Physique Théorique (4.5)
 - ★ Centre de Physique Théorique, Marseille (2)
 - ★ Laboratoire de Physique Théorique de l'ENS Paris (1.5)
 - ★ Laboratoire de Physique Théorique et Hautes Energies (1)
 - ★ Centre de Physique Théorique de l'Ecole Polytechnique (2)
 - ★ Laboratoire de l'Univers et ses Théories (6)
- experimental labs with a theory group:
 - ★ Astroparticle and Cosmologie, Paris (9.5)
 - ★ Laboratoire de Physique Théorique et Astroparticules, Montpellier (4)
 - ★ Institut de Physique Nucléaire, Lyon (1)
 - ★ Institut d'Astrophysique de Paris (7)
 - ★ Observatoire de la Côte d'Azur (2)

In parenthesis, number of FTE in Astroparticle **and** Cosmology
total : 50 FTE



Hiring

- Permanent positions

National level (CNRS)

- section « Astroparticle and cosmology » (last 6 yrs): ~ 1/yr
- section « Theoretical physics »: < 1/yr
- section « Particle and Nuclear Physics »: negligible

Local level

- Universities: 1 to 2/yr
- Atomic Energy Commission (CEA, Saclay): 1 / 2yrs

Comment: hiring in recent years has been very international

- Postdocs

CNRS

- general theory labs (department MP): supports 1 out of 2 applications
- experimental labs with theory groups (IN2P3): basically none

ANR (Agence Nationale pour la Recherche) since 3 years

- half of its support to projects goes into postdoc salary

Regions (except Paris)

- Predocs

New in the French system: fellowships allowing to support students who did not follow a master (M2) in France

Funding

Basic funding comes from the lab general budget (usually CNRS+ministère)

Covers for theorists:

- daily operations (computer support, phone, library, ...)
- basic travel budget
- invitations
- some support to conferences and workshops

Extra funding is project-oriented:

National level:

- CNRS programs
- Agence Nationale pour la Recherche
- University
- Regional funding

Binational and international funding

- Binational funding
- International labs (CNRS)
- European funding

Difficulties in supporting theorists:

- computer purchase unwelcome
- too much emphasis on networking between groups
- excellence not necessarily rewarded
- difficult to compete with experimentalists for which the notion of project is better defined (and easier to identify equipment needs)
- often, experimentalists decide on priorities

National level:

- CNRS programs

IN2P3 theory projects: 100 k€/yr (a quarter to astroparticle)

IN2P3/INSU National Cosmology Program: a few theory projects supported (2k€ to 5k€ each)

IN2P3/INSU High Energy Cosmic Phenomena Research Group (idem)

CNRS Astroparticle program

- Agence Nationale pour la Recherche

Its white program supports general projects of fundamental research, young researcher projects and excellence grants

e.g. LISAScience funded in 2007

4 laboratories (APC, IAP, LUTH, Nice)

3 year program funded at a level of 200 k€

2 theory postdocs + travel money

e.g. excellence grant for the support of a 3-yr visit of A. Olinto

(CNRS: 3 yr salary; ANR: travel budget+ 1 postdoc + 1 predoc)

- University

Bonus Qualité Recherche (BQR): around 10% of the University support to the labs is taxed and redistributed on specific projects (from 5 to 20 k€). Provides seed money for experimental projects and sometimes supports theory projects.

University funding probably ramping up

- Regional funding

e.g. « Physics of the two infinities », group of 19 laboratories in the Paris area working on the infinitely large **and**/or the infinitely small

Support to the community in the form of:

- **postdocs and predocs**
- R&D
- **support to midterm and long term visits (e.g. 1 year visit of D. Spergel)**

Binational and international funding

- Binational funding (important source of travel funds for theory groups)

2 to 3 yr programs with most European countries, with specific rules:
Mostly exchange visits

- International labs (CNRS)

e.g. LIA (Laboratoire International Associé) between APC and KIPAC, Stanford

Focuses on dark energy, high energy gamma rays, gravitational waves,
modélisation and **theoretical physics** - budget: 50k€/yr

- European funding

Similar to anyone else

Three proposals:

- excellence grants, attributed to individuals or small groups, solely on the basis of excellence
- integrated labs: 2 (at most 3) laboratories decide to join efforts for a period of say 4 years and on a specific topic.
- support for 4 to 6 month visits of Ph.D. students