

# Welcome to Toulouse and to L2IT

Jan Stark

Laboratoire des 2 Infinis – Toulouse

WPCF 2024 - 17<sup>th</sup> Workshop on Particle Correlations and Femtoscopy,  
November 4<sup>th</sup> – 8<sup>th</sup> 2024



# Toulouse – a student city



**l'Étudiant**

Metropolitan area: 960 thousand inhabitants (fourth-largest city in France), including 117 thousand students

Rang 2019	Évol. /2018	Ville	Critères					Total
			1	2	3	4	5	
1	=	<input type="checkbox"/> Toulouse	23	23	23	20	27	116
2	↓	<input type="checkbox"/> Lyon	23	24	25	15	27	114
3	=	<input type="checkbox"/> Montpellier	23	23	22	25	20	113
4	=	<input type="checkbox"/> Rennes	23	26	21	15	25	110
5	=	<input type="checkbox"/> Grenoble	22	20	21	23	21	107
5	↑	<input type="checkbox"/> Nantes	22	22	20	16	27	107

# Toulouse – a city of research



Second city in France in terms of the number of CNRS employees (after Paris)

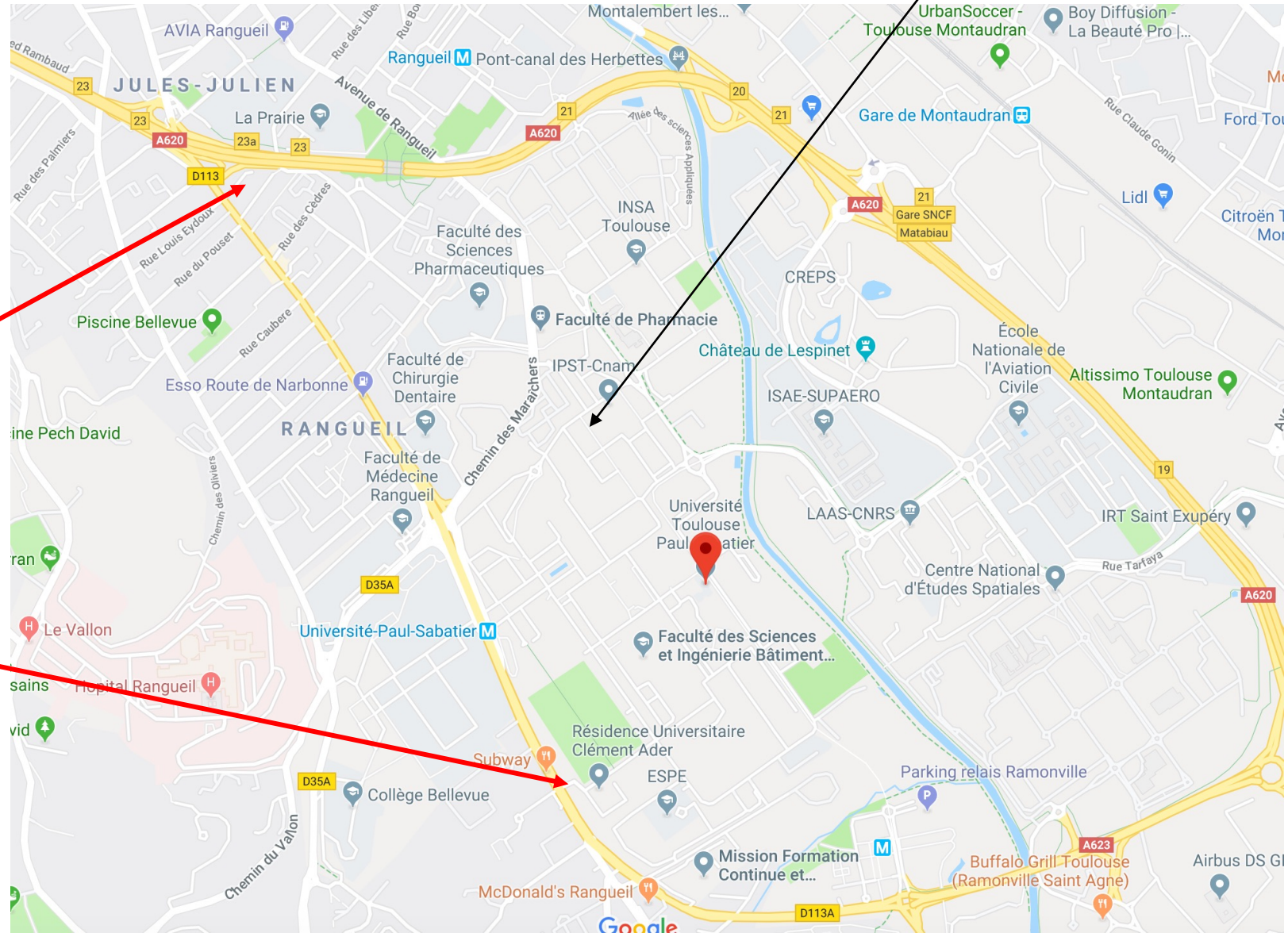
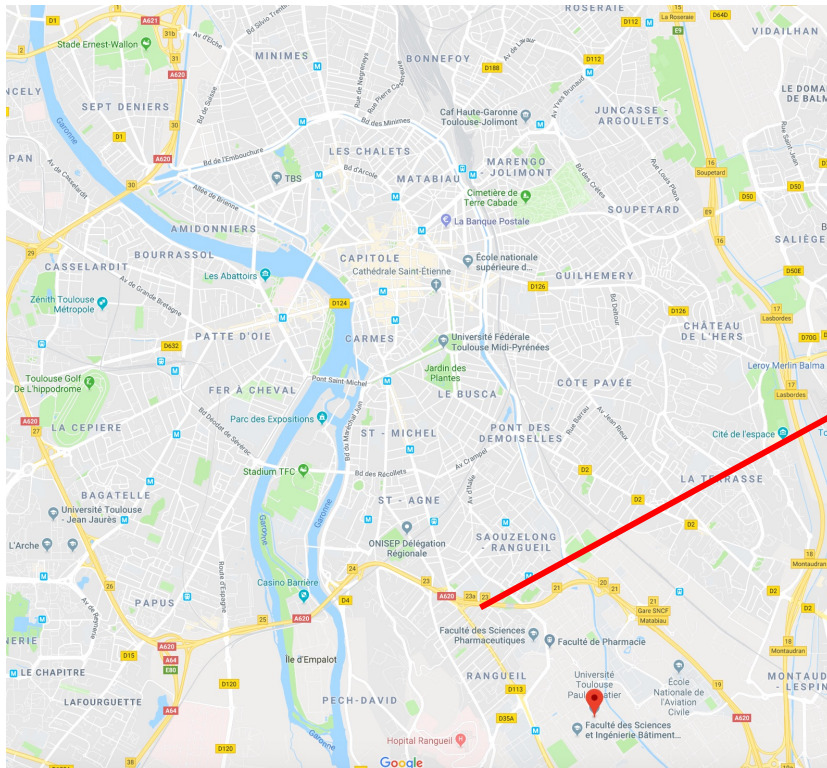


(impossible to list all labs or all researchers in the private sector)



# Campus of *Paul Sabatier University*

L2IT



# L2IT in 2020



The Lab was created by Paul Sabatier University and IN2P3 / CNRS in January 2020 with initially 4 members.

# ... and now

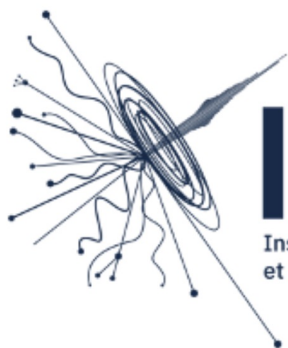


L2IT

Extension (under construction)

As of today: 35 members



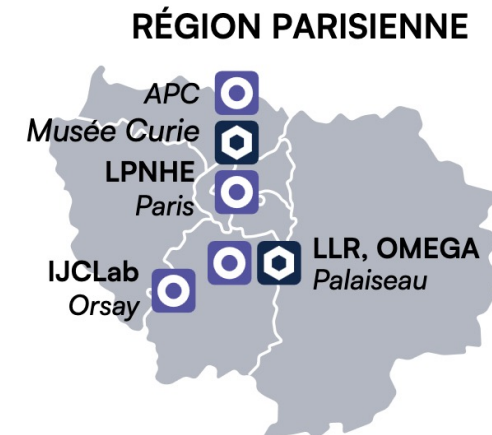
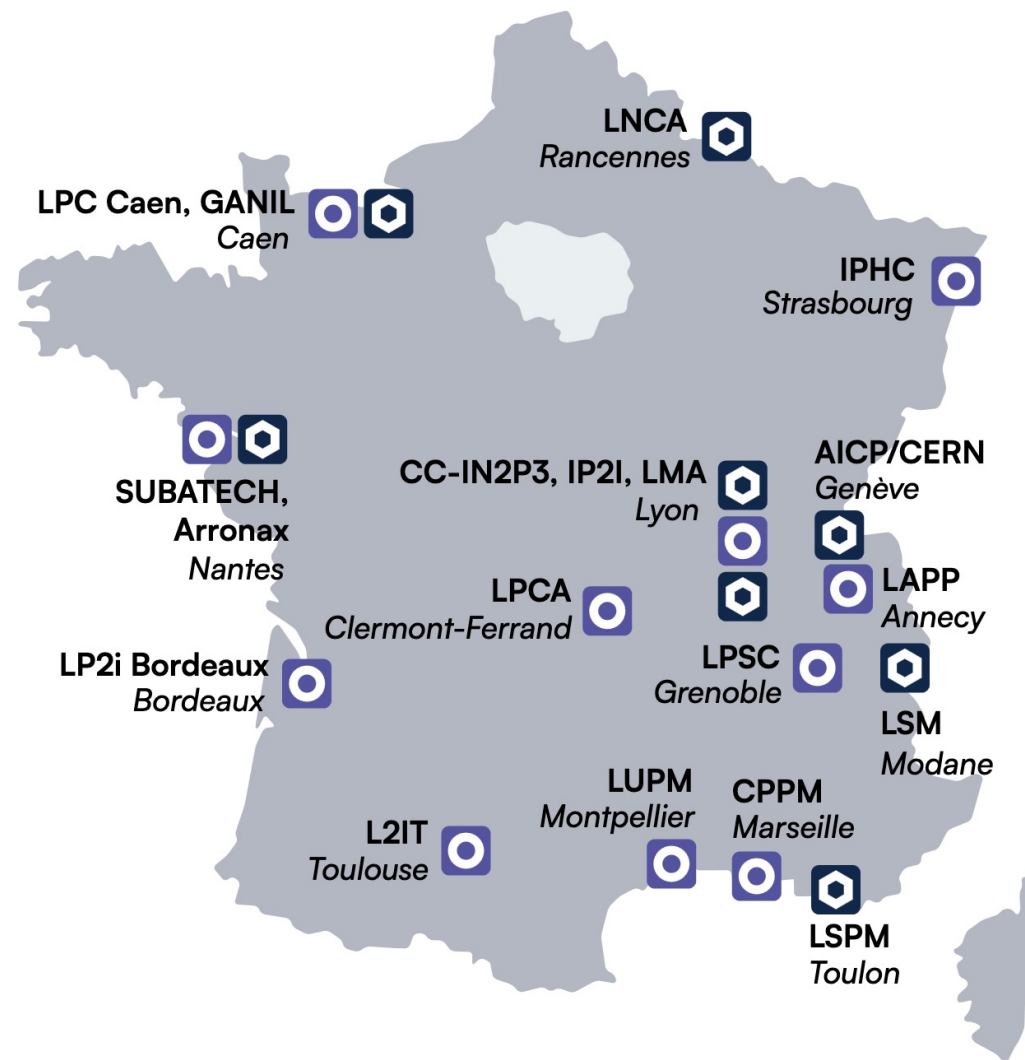



# IN2P3


Institut national de physique nucléaire  
et de physique des particules

16 research labs (*UMR in French*)  
in France

plus shared infrastructures,  
including CC-IN2P3,  
a big computing center



 Unité mixte de recherche

 Infrastructure et plateforme nationale

# L2IT research topics

Development of new methods  
for simulation and data analysis

What is the shape of the  
Higgs potential ?  
→ its origin  
→ its role during the first instants  
of the Universe  
(electroweak baryogenesis ?,  
emission of gravitational waves ?)

How do gravitational waves  
propagate in the Universe ?  
→ information on the nature of  
dark energy ?  
→ modified gravitation ?

How does nuclear matter behave under  
extreme conditions (density, pressure) ?  
→ compact stars  
→ impact on the emission of  
gravitational waves and neutrinos  
Nuclear structure and dynamics  
→ impact on nucleosynthesis

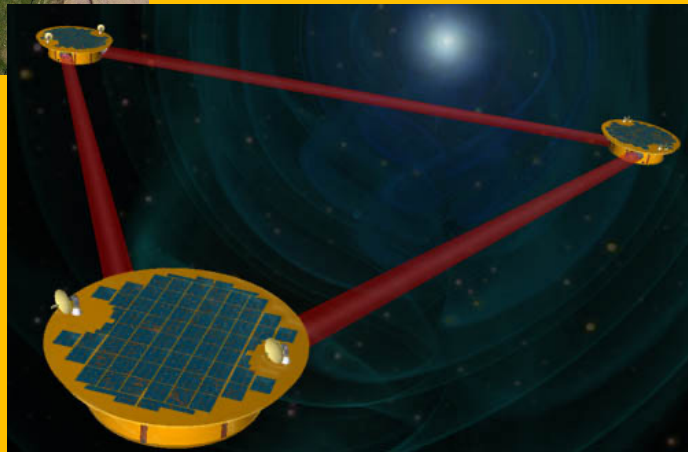


# L2IT research topics

## Gravitational waves



Virgo detector



Future LISA mission (3 satellites)

new methods  
and data analysis

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→ information on the nature of dark energy ?  
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## Nuclear physics



Theory and INDRA-FAZIA experiment at *Grand Accélérateur National d'Ions Lourds* (GANIL, Caen)

H  
e

→ impact on  
gravitational waves and neutrinos

Nuclear structure and dynamics

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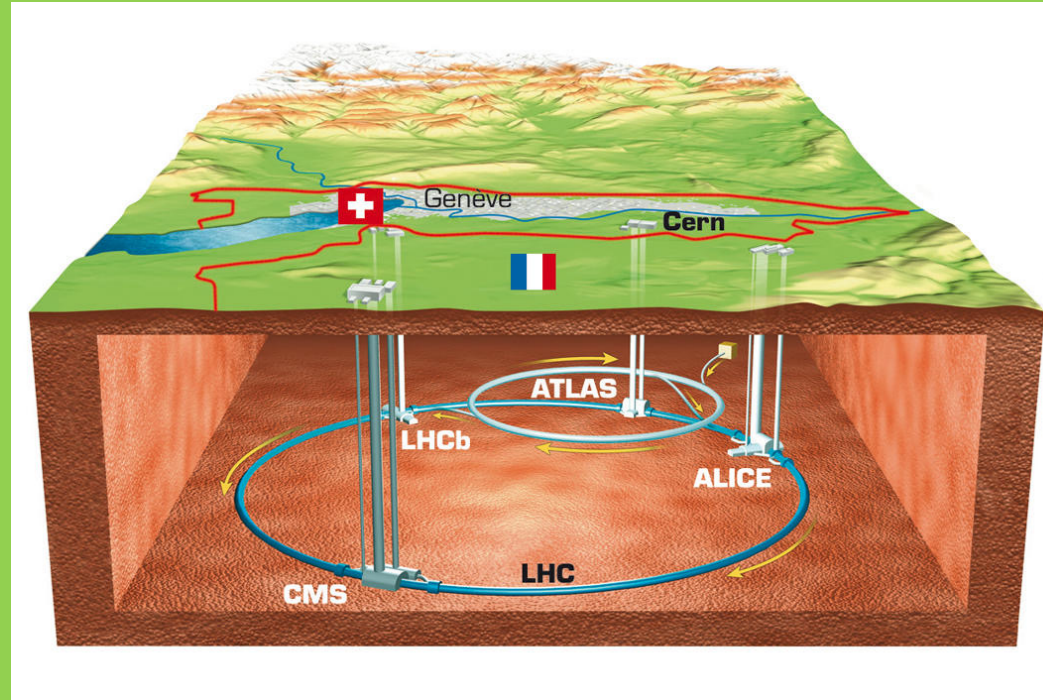
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emission of gravitational

## Particle physics



## ATLAS experiment at CERN

Nuclear structure and dynamics  
→ impact on nucleosynthesis

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# L2IT research topics

## Defining feature:

Focus on novel analysis methods

Modelling, simulation and modern analysis techniques are the main focus of L2IT.

We are developing these innovative aspects of research in the fields of nuclear and particle physics and cosmology, in close collaboration with experts from Toulouse's ecosystem of research in computing, artificial intelligence, physics, astronomy and astrophysics.

Nuclear structure and dynamics  
→ impact on nucleosynthesis

## XVII<sup>th</sup> edition of the international Workshop on Particle Correlations and Femtoscopy

Palais Consulaire, Toulouse, France

<https://indico.in2p3.fr/e/WPCF2024>  
[wpcf2024-loc@univ-tlse3.fr](mailto:wpcf2024-loc@univ-tlse3.fr)

**4-8 November 2024**

One session will be dedicated to the career of  
Prof. Scott Pratt from Michigan State University.

### International Advisory Committee

Marcus Bleicher (Goethe University, Germany)  
Panos Christakoglou (NIKHEF, The Netherlands)  
Mate Csanad (University of Budapest, Hungary)  
Tamas Csorgo (University of Budapest, Hungary)  
Pawel Danielewicz (FRIB - MSU, USA)  
Laura Fabbietti (Technische Universität München, Germany)  
Alessandra Fantoni (INFN-LNF, Italy)  
Diego Gruyer (LPC Caen, France)  
Adam Kisiel (WUT, Poland)  
Marcin Kucharczyk (IFJ PAN, Poland)

Roy A. Lacey (Stony Brook University, USA)  
Mike A. Lisa (Ohio State University, USA)  
Takashi Nakamura (Tokyo Tech & RIKEN, Japan)  
Sandra S. Padula (UNESP, Brazil)  
Scott Pratt (Michigan State University, USA)  
Raimond Snellings (Utrecht University, The Netherlands)  
Yuri Sinyukov (BTPI-NAS, Ukraine)  
Michal Sumbera (ASCR, Czech Republic)  
Giuseppe Verde (INFN Catania, Italy)  
Hanna Zbroszczyk (WUT, Poland)

Welcome !  
It is a pleasure to have you here.

Let's have a productive workshop.

