

Welcome to Toulouse and to L2IT

Jan Stark

Laboratoire des 2 Infinis – Toulouse

Workshop on Heterogeneous Data and Large Representation Models in Science,
September 30th – October 3rd 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)

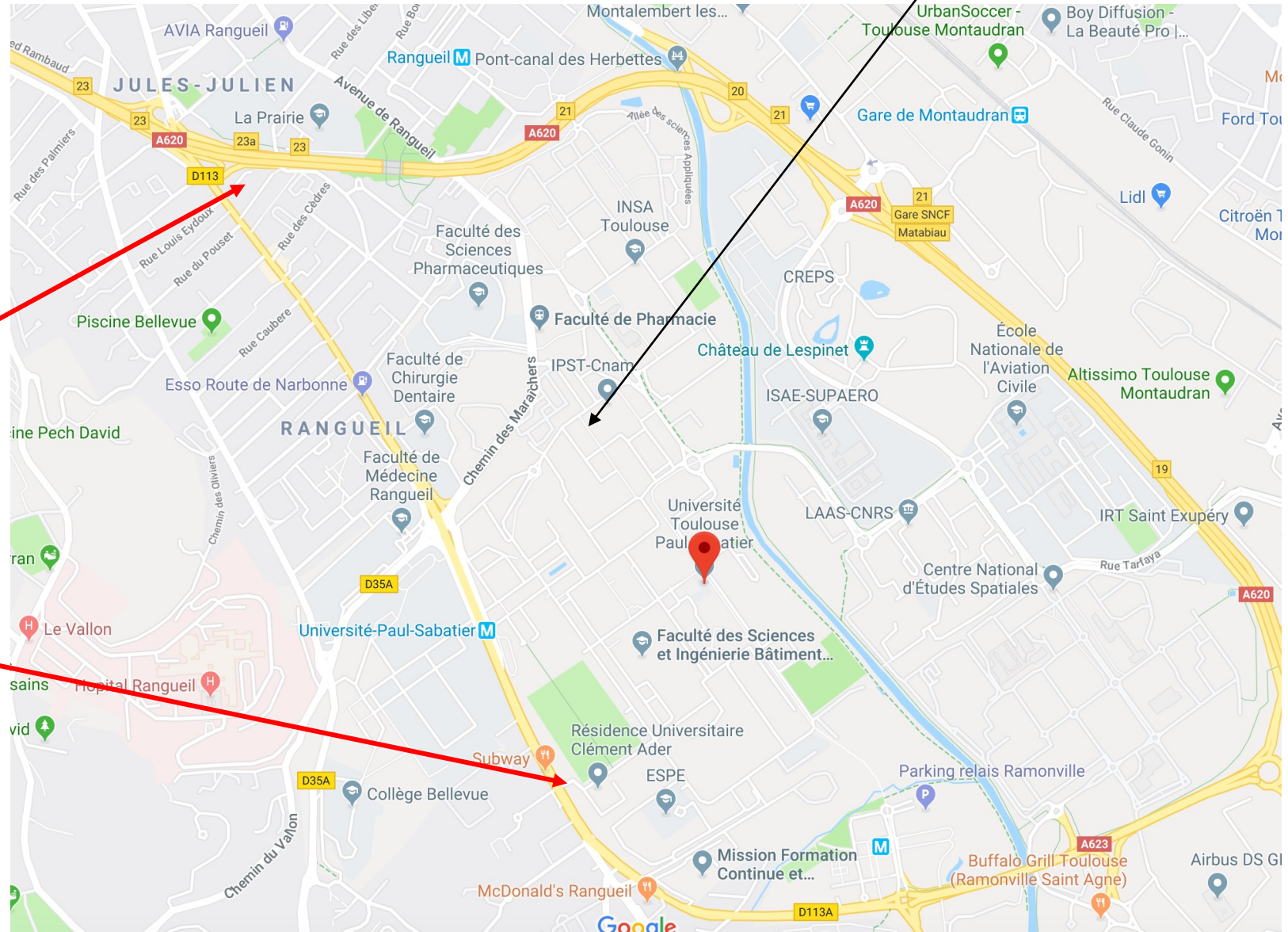
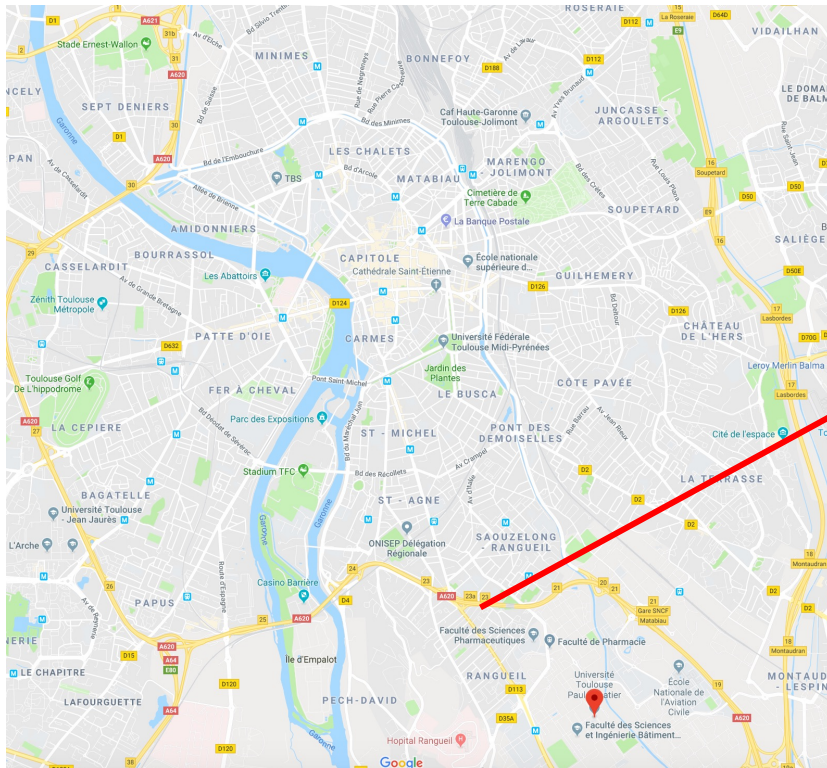


(impossible to list all labs or all researchers in the private sector)



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

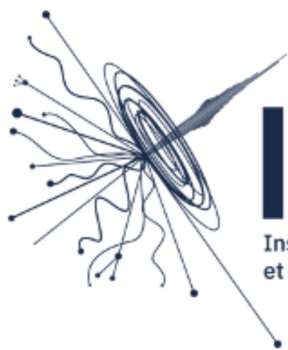


L2IT

Extension (under construction)

As of today: 35 members



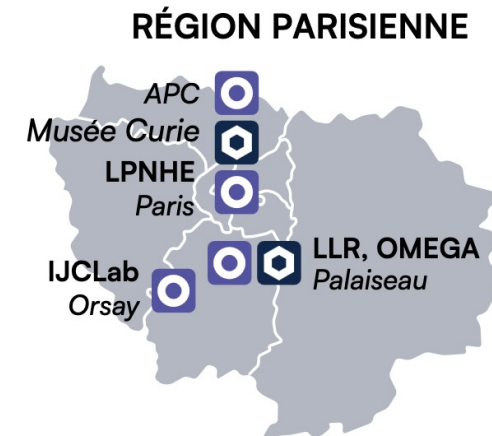
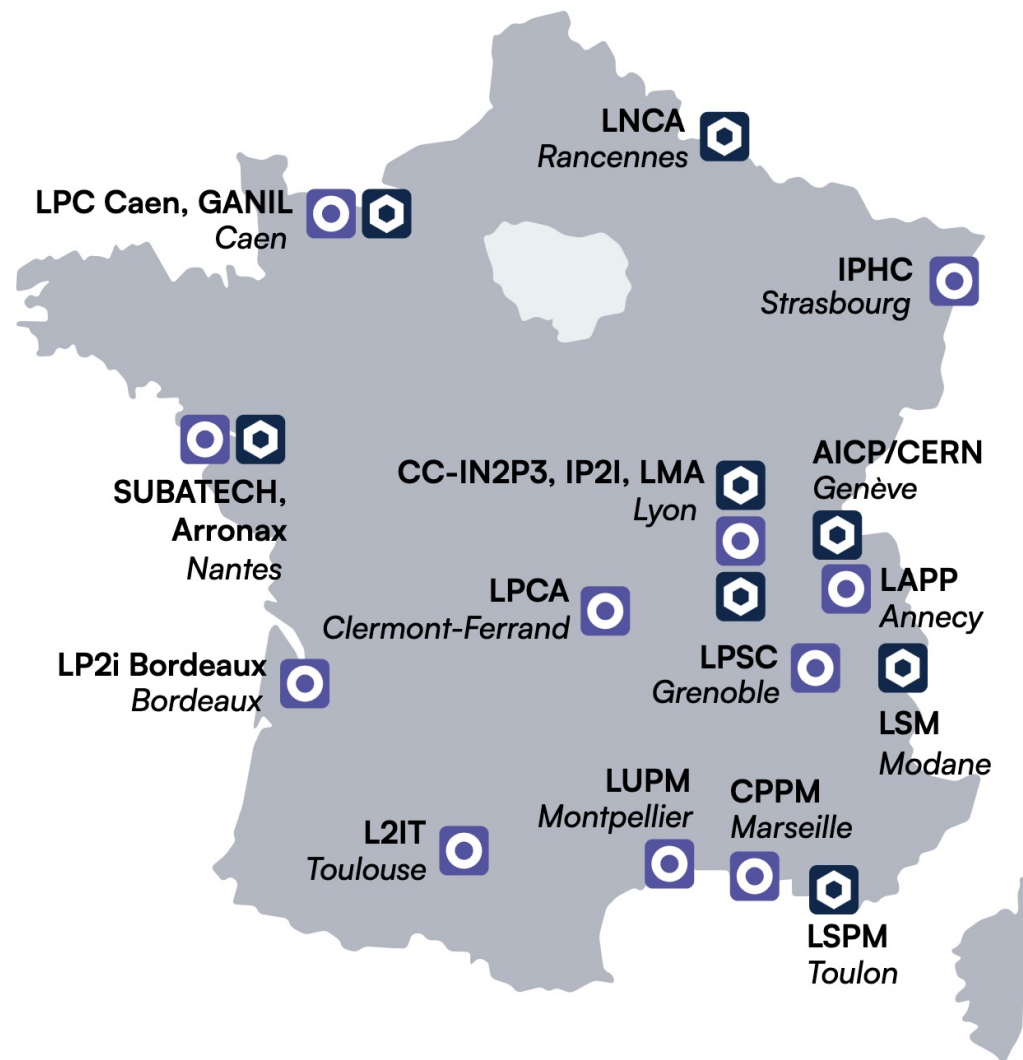


IN2P3

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 ?

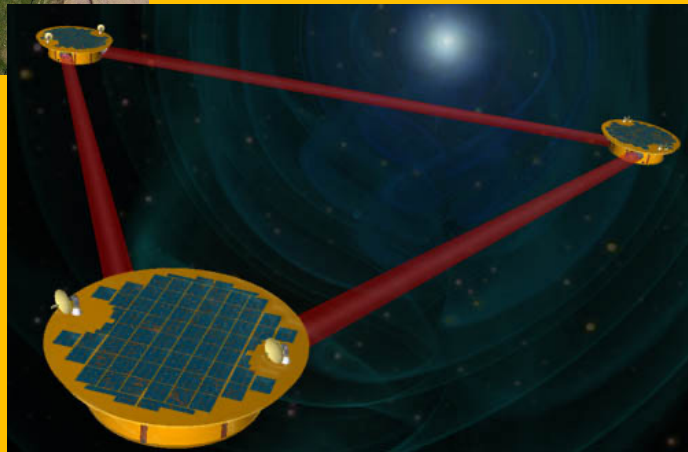
How does nuclear matter
behave under extreme conditions
(density, pressure) ?
→ compact stars
→ impact on the emission of
gravitational waves and
neutrinos

L2IT research topics

Gravitational waves



Virgo detector



Future LISA mission (3 satellites)

new methods
and data analysis

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Nuclear physics



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

→ comparison of the emission of gravitational waves and neutrinos

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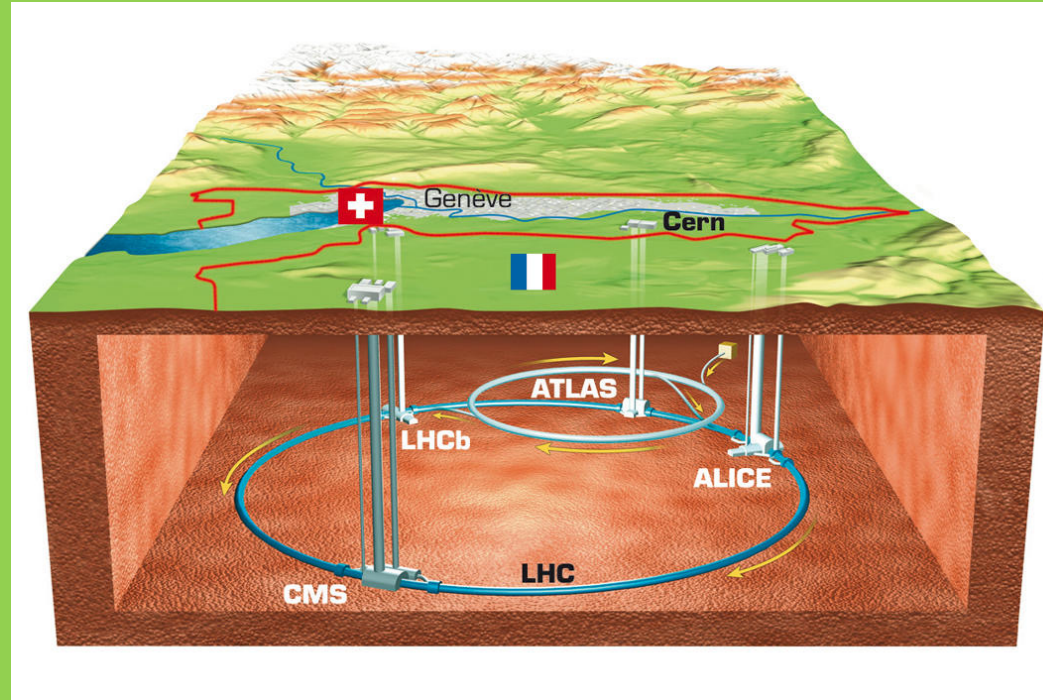
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Particle physics



ATLAS experiment at CERN

gravitational waves and
neutrinos

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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.

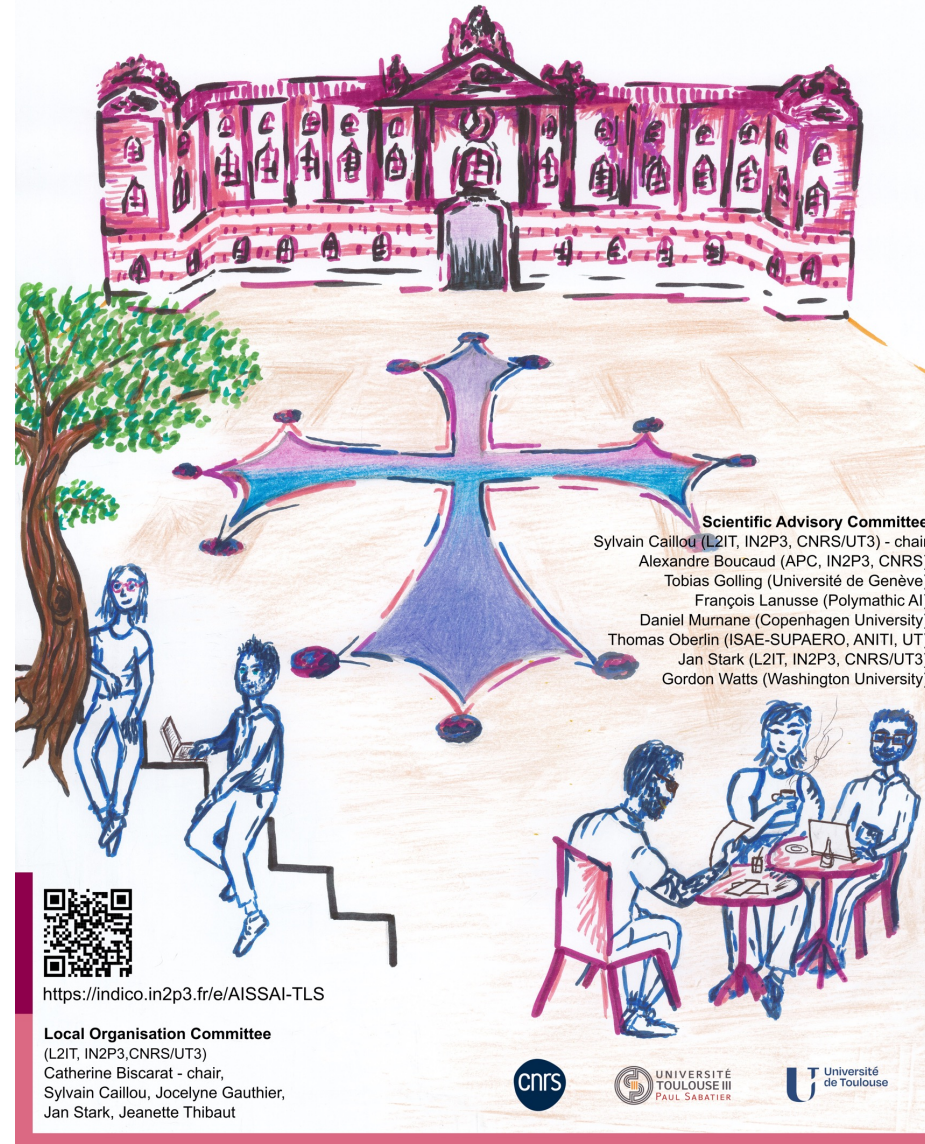
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Workshop on Heterogeneous Data and Large Representation Models in Science

Toulouse, France, 30 September - 3 October 2024

AI S2 AI
AI for science, science for AI

L2IT
Laboratoire
des 2 Infinis
Toulouse



Scientific Advisory Committee
Sylvain Caillou (L2IT, IN2P3, CNRS/UT3) - chair
Alexandre Boucaud (APC, IN2P3, CNRS)
Tobias Golling (Université de Genève)
François Lanusse (Polymathic AI)
Daniel Murnane (Copenhagen University)
Thomas Oberlin (ISAE-SUPAERO, ANITI, UT)
Jan Stark (L2IT, IN2P3, CNRS/UT3)
Gordon Watts (Washington University)

Local Organisation Committee
(L2IT, IN2P3, CNRS/UT3)
Catherine Biscarat - chair,
Sylvain Caillou, Jocelyne Gauthier,
Jan Stark, Jeanette Thibaut

<https://indico.in2p3.fr/e/AISSAI-TLS>

cnrs UNIVERSITÉ TOULOUSE III PAUL SABATIER U Université de Toulouse

Welcome !

It is a pleasure to have you here.

Let's have a productive workshop.