



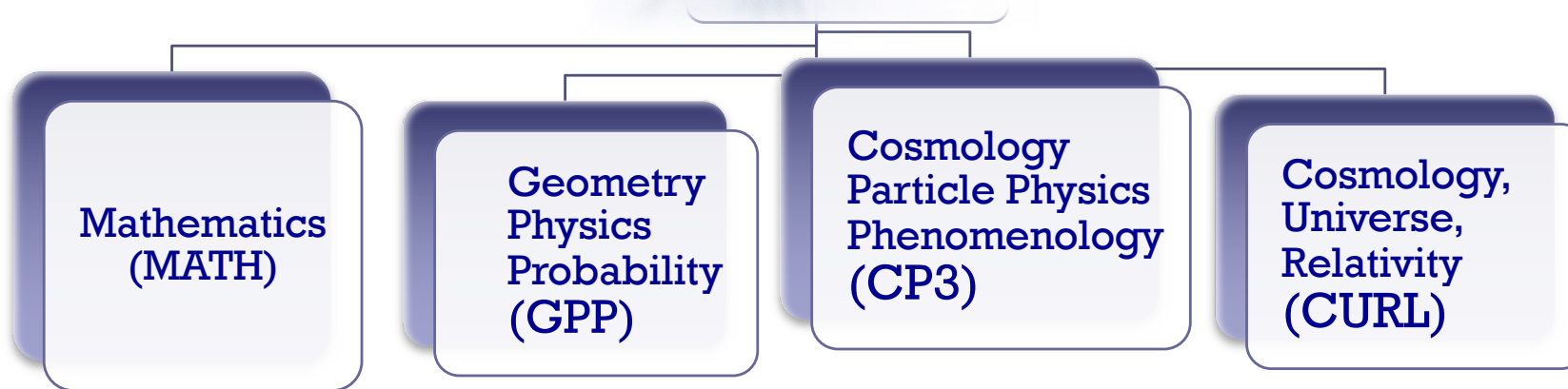
IRMP

Institut de Recherche en Mathématique et Physique

Visit of the Scientific Committee - 26 April 2024

Institut de Recherche en Mathématique et Physique

IRMP



In 2024 the IRMP has **135 FTE**, among which **26** academics.

Mathematics (MATH)

■ Members

- 11 academics
- 11 post-docs
- 18 PhD Students

■ Research themes

- Algebraic topology
- Category theory
- Geometric group theory
- Nonlinear analysis and differential equations
- Mathematical education



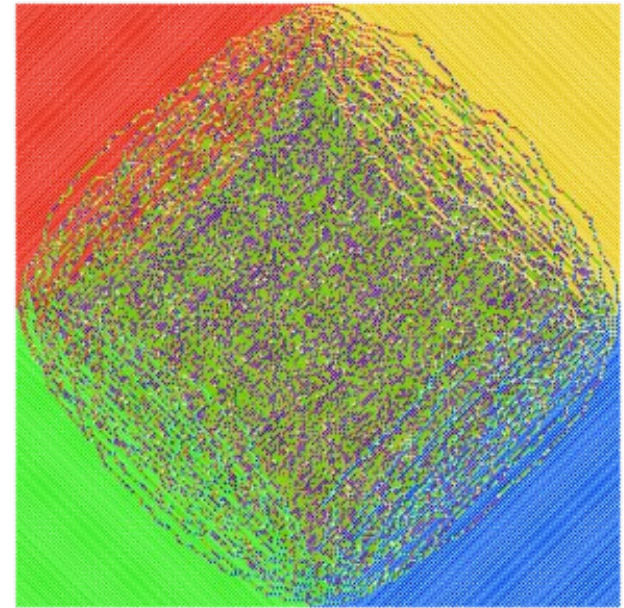
Research Centre in Geometry, Physics and Probability (GPP)

■ Members

- 4 academics
- 3 post-docs
- 4 PhD students

■ Research themes

- Noncommutative geometry and mathematical physics
- Random matrices and integrable systems
- Supersymmetry, integrability and combinatorics
- Statistical field theory and lattice models



Antoine Bevilacqua
<https://www.cloudynub.com/artefactdiamond/>

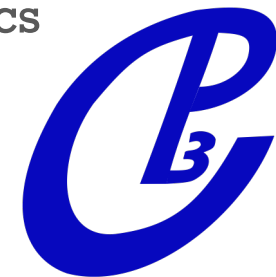
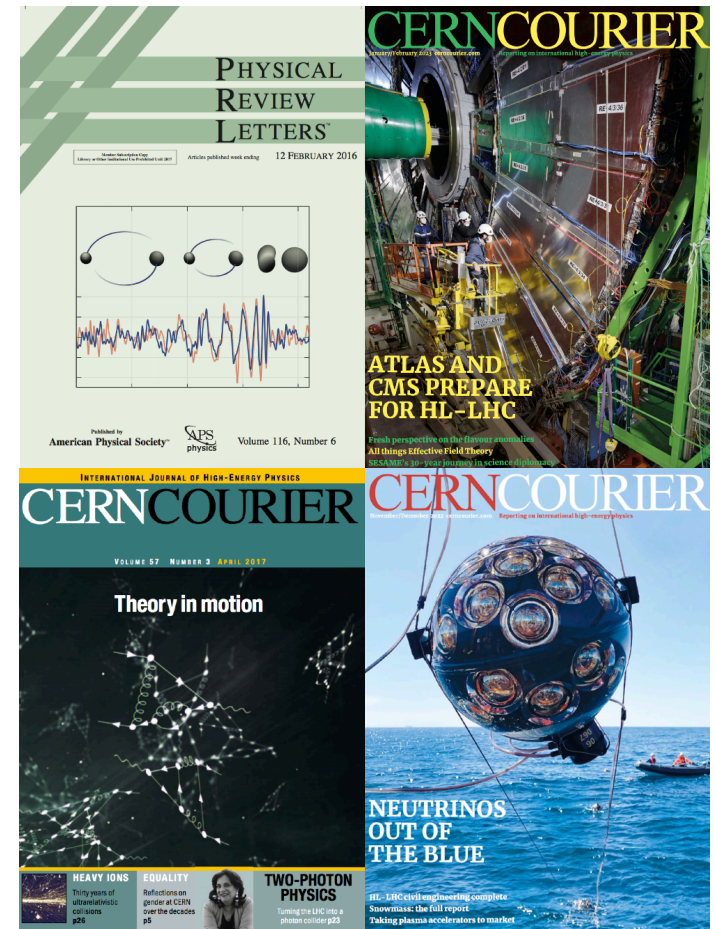
Centre for Cosmology, Particle Physics and Phenomenology (CP3)

■ Members

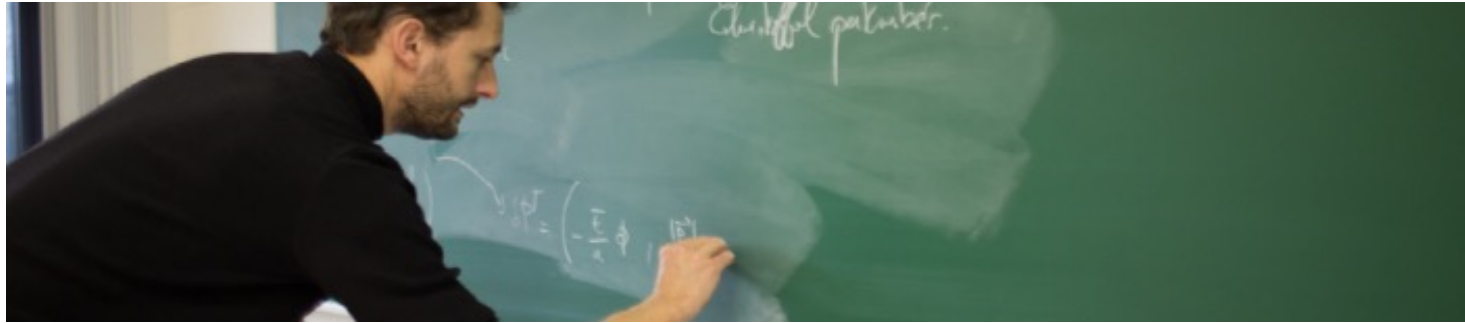
- 10 academics
- 18 post-docs
- 30 PhD students
- 3 permanent research scientists
- 2 engineers and computer scientists

■ Research themes

- Theory/Phenomenology -
Fundamental interactions and Cosmology
- Data analysis - (Astro-)particle physics experiments
- Instrumentation - R&D on detectors for (astro-)particle physics and their applications



Cosmology, Universe and Relativity (CURL)



■ Members

- 1 academic
- 1 post-doc and 1 PhD student
- 2 external academics

■ Research themes

- Cosmology : cosmic inflation, topological defects, data analysis for the Euclid satellite, gravitational waves.

Recent appointments (since 2018)

- 2018 Céline Degrande (Mandat Ulysse, *chargée de cours*, CP3)
- 2018 Heiner Olbermann (*chargé de cours*, MATH)
- 2020 Timothée Marquis (*chercheur qualifié FNRS*, MATH)
- 2021 Gwenhaël de Wasseige (*chargée de cours*, CP3)
- 2022 Laure Ninove (*chargée de cours*, MATH)
- 2022 Gauthier Durieux (*chercheur qualifié FNRS*, CP3)
- 2023 Agni Bethani (*chargée de cours*, CP3)

In 2021 Pierre-Emmanuel Caprace (MATH) became *professeur* (« académisation » following the retirement of L. Haine (GPP))

Administrative Staff

- Chiara Arina (IRMP administrative coordinator, **new position**)
- Martine Furnemont (IRMP secretary and accountant)
- Cathy Brichard (research secretary)
- Elodie Hannyoy (research secretary)
- Stéphanie Landrain (accountant)
- Carinne Mertens (research secretary)

The Cyclotron Resource Centre (CRC)

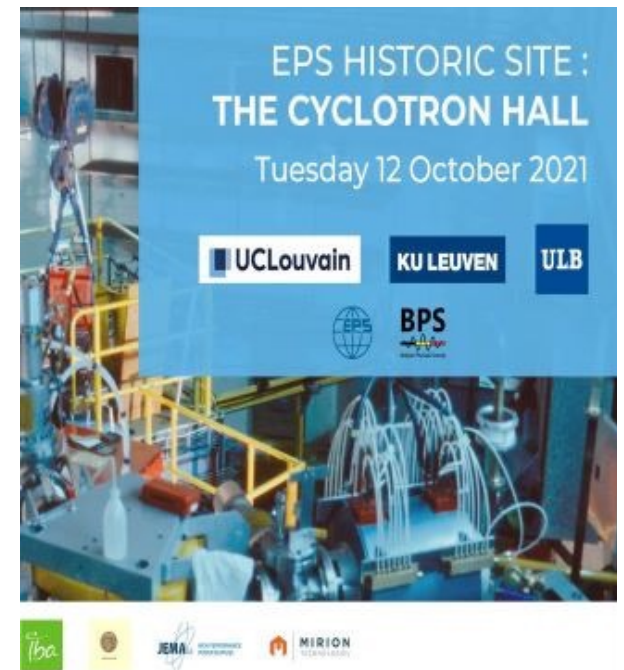
Main activities:

- **Radiation hardness tests for electronic components** with heavy ion beams, proton beams, neutron beams and a cobalt source.
- Production of **microporous membranes**.

Director: Nancy Postiau

Vice-director: Laurent Standaert

Staff: 15 FTE



IRMP technical workshops and laboratories

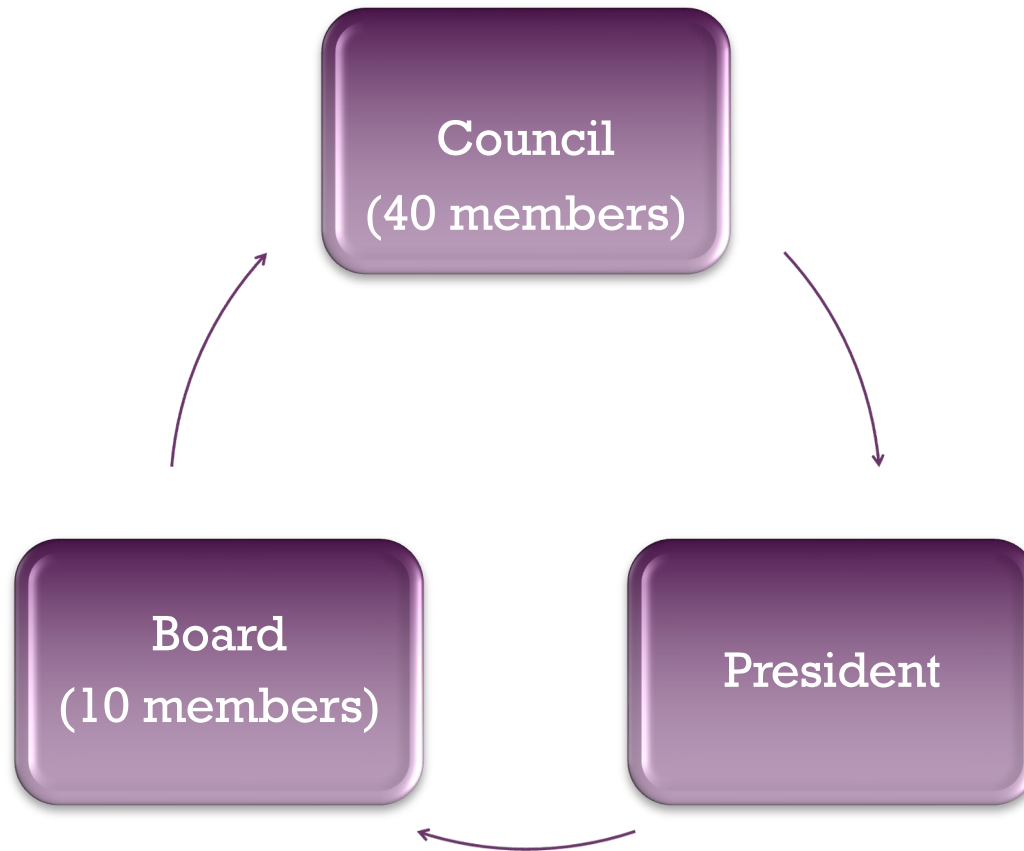
- **Mechanics**
- **Electronics**
- **Design office**



Collaboration with **CISM**
(Centre for high performance computing and mass storage)



IRMP Organization



IRMP Board

- M. Gran (president)
- C. Delaere (vice-president, CP3)
- C. Arina (IRMP administrative coordinator)
- M. Furnemont (IRMP secretary)
- T. Claeys (GPP)
- C. Degrande (CP3)
- P. Vaz (MATH)
- C. Brichard (PAT representative)
- M. Culot and A. Depasse (junior scientific staff representatives)

Eco-responsibility

In 2021 a **working group** in **Eco-responsibility** was created at the IRMP with the goal of establishing an « IRMP charter for sustainable development ».

- **Reduce the carbon footprint** caused by professional activities
- Support **sustainable development projects**

The « **green team** » is responsible of a budget to support these goals.

Members of the « **green team** » (in 2024) :

P.-E. Caprace, C. Ringeval, C. Mertens, J. de Favereau, L. De Man,
L. Schelstraete, E. Genton.

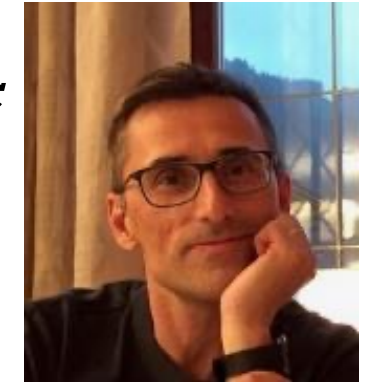
Selected honors and awards

Pierre-Emmanuel Caprace was elected a full member at the *Royal Academy of Science of Belgium* in 2023.

He was an *invited speaker* in the algebra section of the *International Congress of Mathematicians* in 2022.



Fabio Maltoni was appointed member of the *CERN Scientific Policy Committee* in 2022.



Michel Willem was elected President of the *Royal Academy of Science of Belgium* in 2022.



Selected honors and awards

In 2021, **Jean Van Schaftingen** was awarded the 18th *Jacques Deruyts Prize*.



In 2021, **Gwenhaël de Wasseige** was the new *Francqui Professor* at UCLouvain.



In 2018, **Tom Claeys** was awarded the *Adolphe Wetrems Prize*.



Excellence of Science



**High-dimensional expanders and Kac-Moody-Steinberg groups
(2022-2025)**

P.-E. Caprace and T. Marquis (MATH)

**Partners in Research on Integrable Methods and Applications
(2018-2021)**

T. Claeys, C. Hagendorf and P. Ruelle (GPP)

**The H boson gateway to physics beyond the Standard Model
(2018-2021)**

F. Maltoni, G. Bruno, E. Cortina, C. Delaere and A. Giammanco
(CP3)

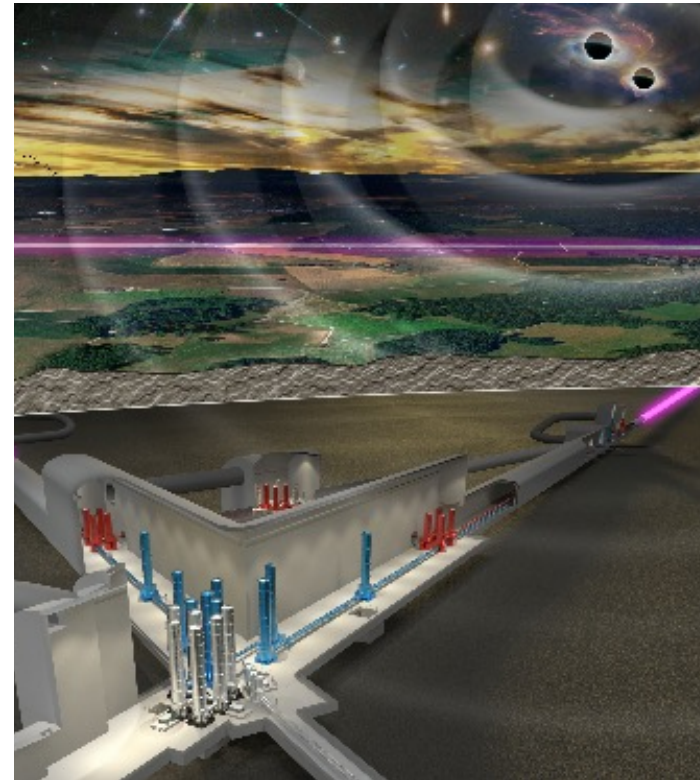
Walloon Region Win4Project grant

(2.3 M€ for instrumentation and personnel)

ETOPT: Lasers and Optics for the Einstein Telescope

(January 2025 - December 2028)

G. Bruno (CP3) and C. Lauzin (IMCN)



IRMP Publications (2020-23)

583 peer-reviewed research articles

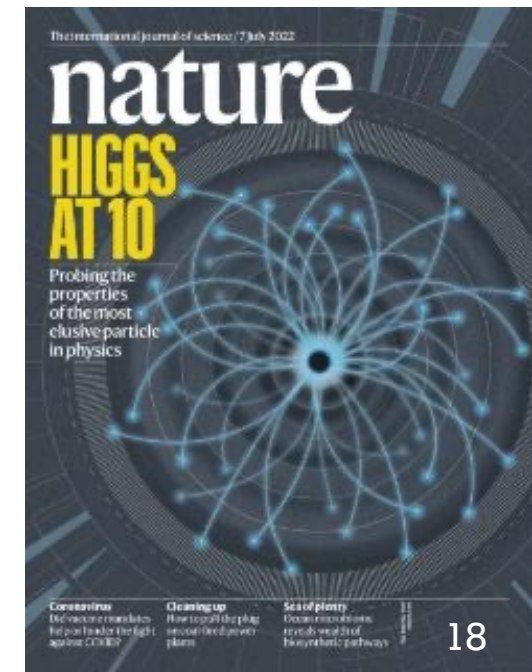
67 ranked « A* »

399 ranked « A »

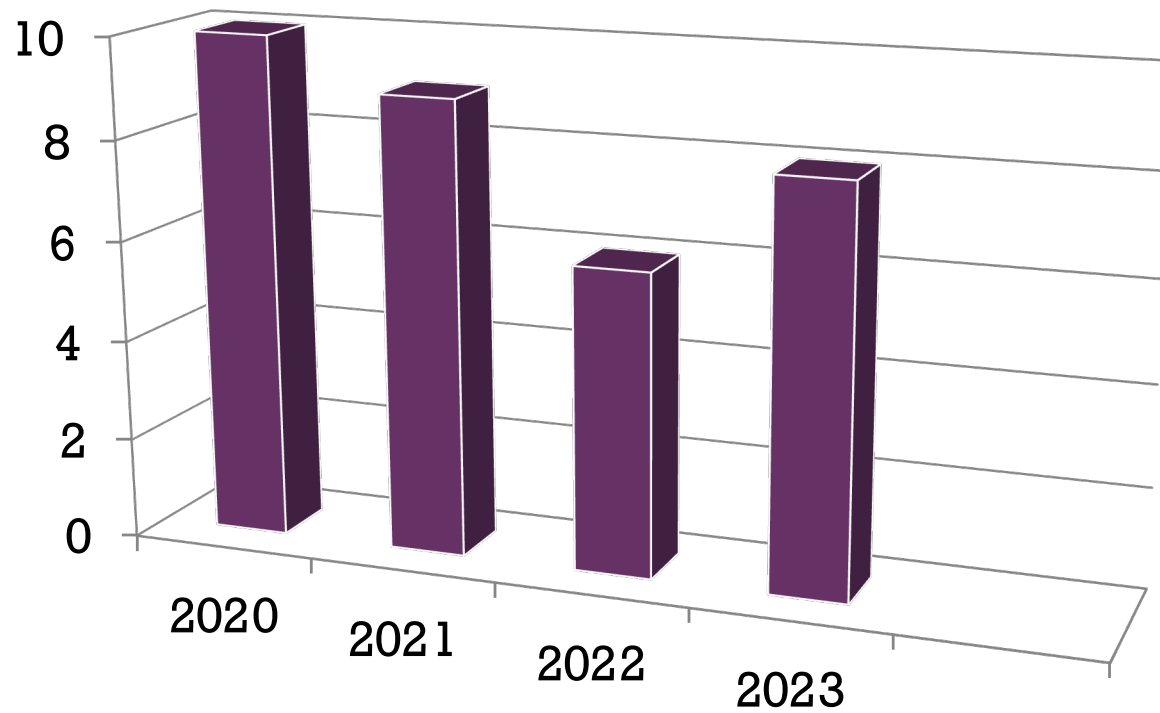
101 ranked « B »

16 ranked « C »

(i.e. 80% of the publications are in journals that are rated A or A*)



PhD theses defended per year at the



IRMP Chairs

Chaire de la Vallée Poussin

2019 Alekseev Anton (Geneva University)

2020-21 Guido de Philippis (New York University)

2022 Ieke Moerdijk (Utrecht University)

2023 Kathryn Hess Bellwald (EPFL)



Chaire Georges Lemaître

2018 Roberto Trotta (Imperial College)

2019 Stefan Hild (Maastricht University)

2021 Tracy Slatyer (MIT)

2023 Markus Ahlers (University of Copenhagen)



Prix Georges Lemaître 2023 Fondation Louvain

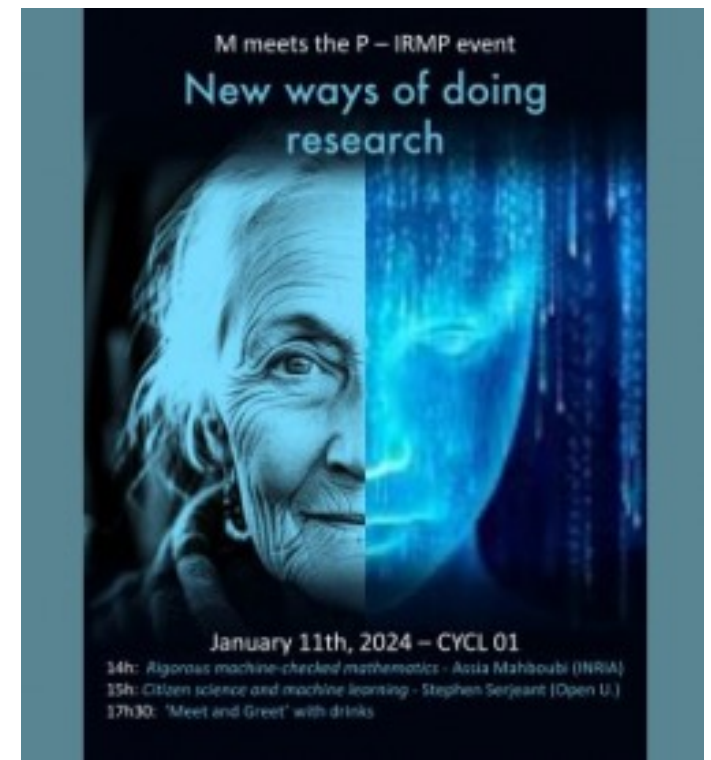
Prof. **Sheperd Doeleman** (Harvard
Smithsonian Center for Astrophysics)
was the recipient of the **Lemaître Prize**.



« When the M meets the P at the IRMP »

Created in 2014, the aim of this annual meeting is to bring together the mathematical and the physical souls of our institute.

2024 Organizing committee: P. Bieliavsky and G. de Wasseige



IRMP Inaugural Lectures

Since 2017 every newly appointed academic gives an inaugural lecture.



Laure Ninove gave the most recent *inaugural lecture* in February 2024, entitled « Argumentation en classe des mathématiques »

International Conferences (2023)



International Category
Theory Conference

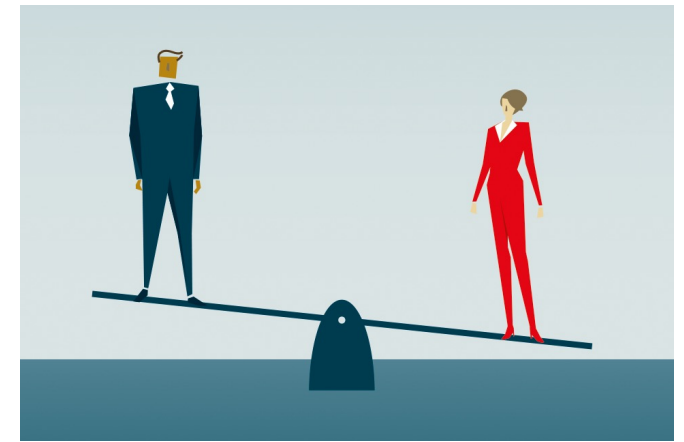
Louvain-La-Neuve,
July 2023



A decade of discoveries in High
Energy Physics

Brussels Town Hall, March 2023

Some challenges...



- **Improve gender balance!**

The situation has improved since 2018: **4 out of 5** academics that were appointed since then are **women**

- **Develop new synergies** among our research teams
- **Recrute some outstanding young researchers** in the coming years (FNRS)
- Increase **eco-responsibility** (and decrease the carbon footprint)
- **Strengthen** the administrative and technical staff

Thank you for your attention!

