

Welcome to the Florence Theory Group Day



THE GALILEO GALILEI INSTITUTE
FOR THEORETICAL PHYSICS (GGI)



INFN NATIONAL CENTER FOR ADVANCED STUDIES

**THE GALILEO GALILEI INSTITUTE
FOR THEORETICAL PHYSICS**

ARCETRI - FIRENZE



SIMONS FOUNDATION

THE GALILEO GALILEI INSTITUTE FOR THEORETICAL PHYSICS

ARCETRI - FIRENZE

The GGI is a research hub dedicated to organising and hosting long-term (6-8 weeks) programs and (2-3 weeks) PhD schools to foster breakthroughs in the fundamental understanding of the universe



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More than 800 scientists are hosted at the GGI every year thus confirming its status as a **reference point** in high-level training and research for the international scientific community



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Invited speakers and other contributors to the GGI activities are **equally considered** regardless of **gender, nationality and ethnic or social origin**. The GGI actively welcomes interactions among the participants, providing a comfortable and professional work environment



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The hill of Arcetri



Arcetri Astrophysical
Observatory

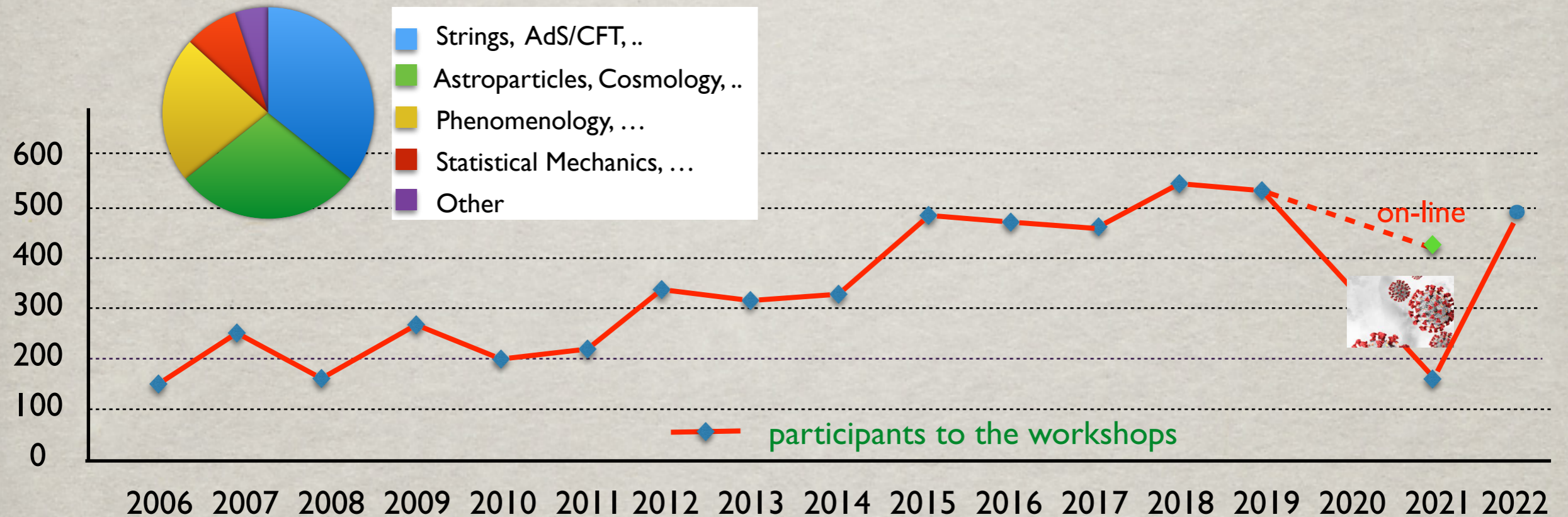
The Department of Physics and Astronomy of the
University of Florence and the Galileo Galilei Institute
for Theoretical Physics of INFN

National Institute of Optics

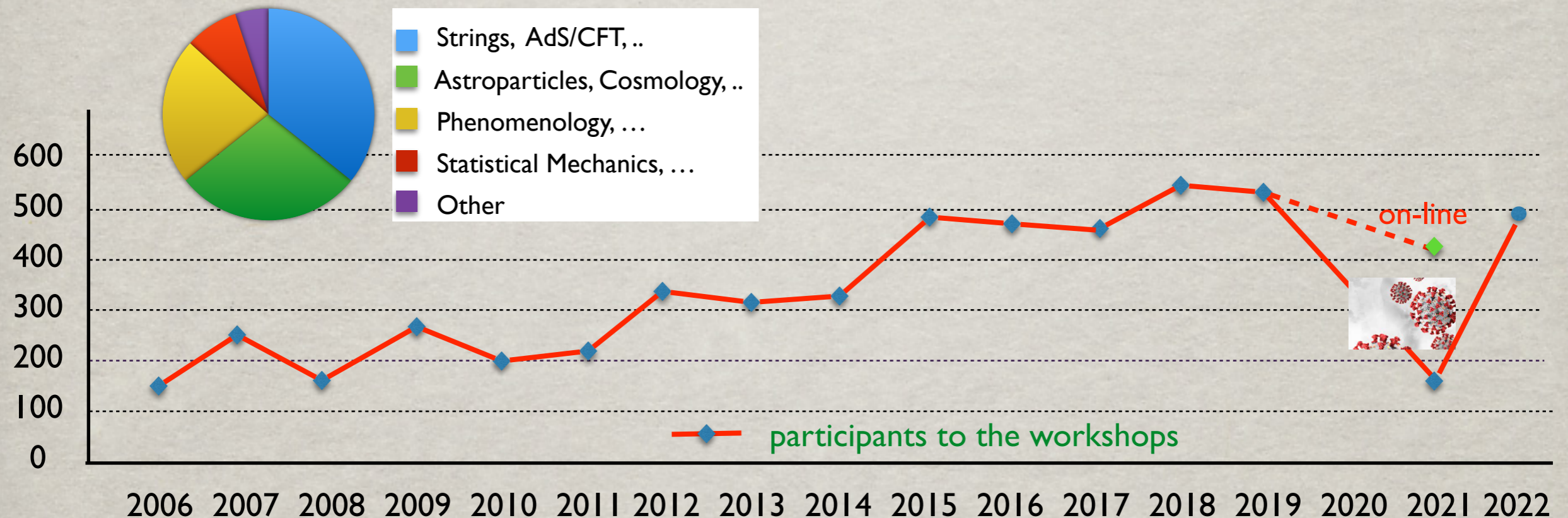


2012 - Arcetri EPS historical site

To date, **52 workshops** have been held at the GGI, with an increasing number of participants up to 2019, covering all the areas of theoretical physics that are of interest to the INFN and **encouraging links between the various topics** and the scientific interaction of researchers with different skills



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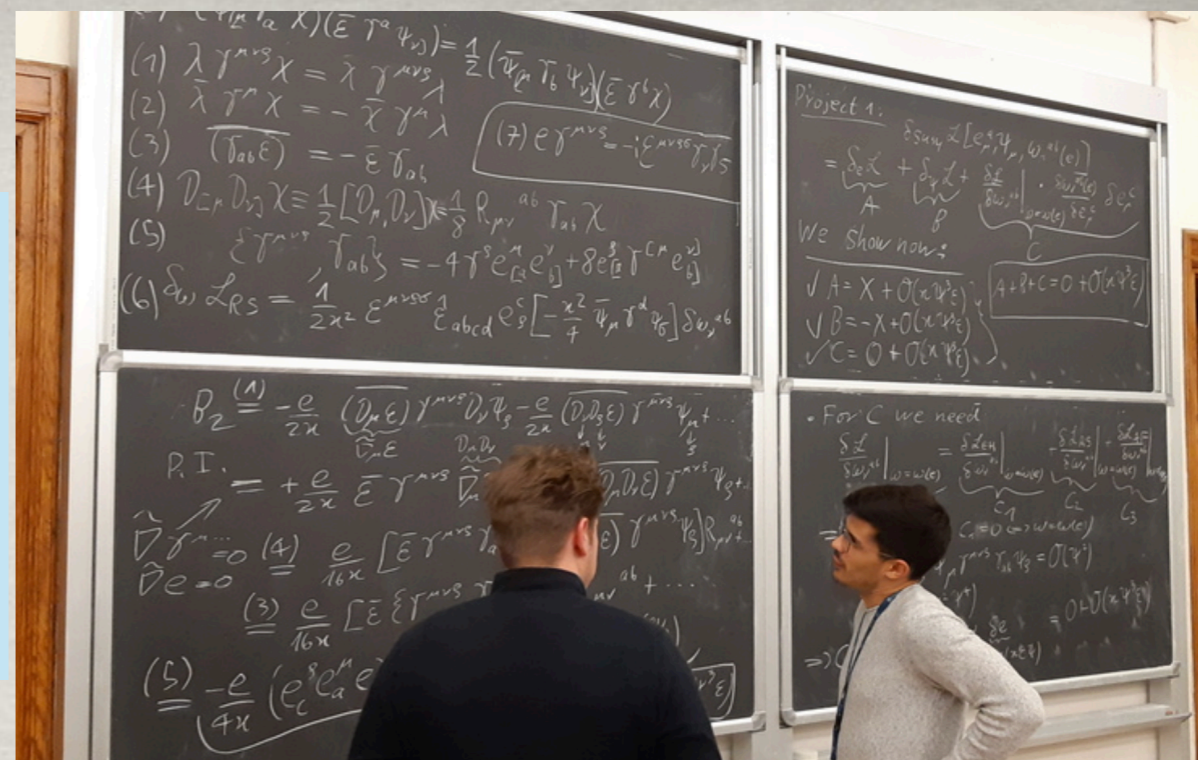
The GGI is the ideal place for “contamination” between the various areas of research

Contacts with experimental research associated with the subject of the workshops are particularly encouraged thus fostering the **synergy between the theoretical and experimental communities**

PhD Schools @ GGI

Since 2014 the GGI organises also 5 international schools for PhD students every year. These include advanced lectures in:

- Field and string theory
- Theory of fundamental interactions
- Statistical field theory
- Nuclear and hadronic physics
- Astro-particle physics



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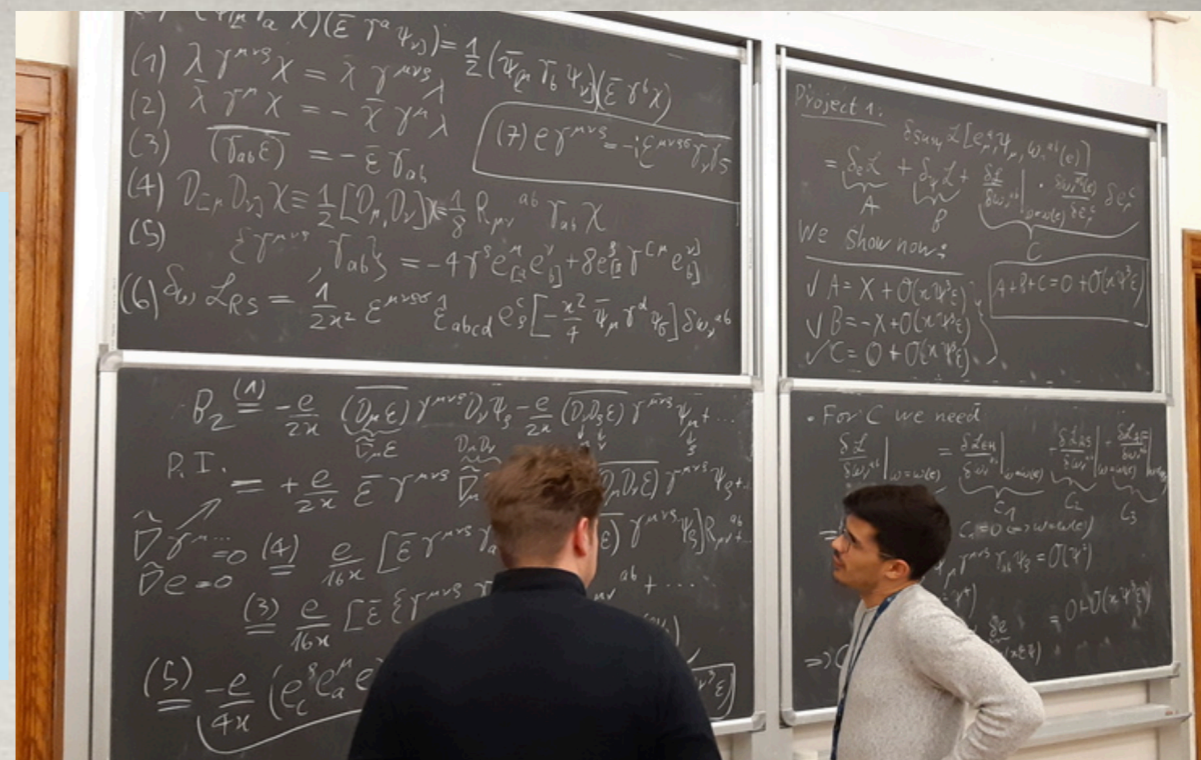
Field and string theory

Theory of fundamental interactions

Statistical field theory

Nuclear and hadronic physics

Astro-particle physics

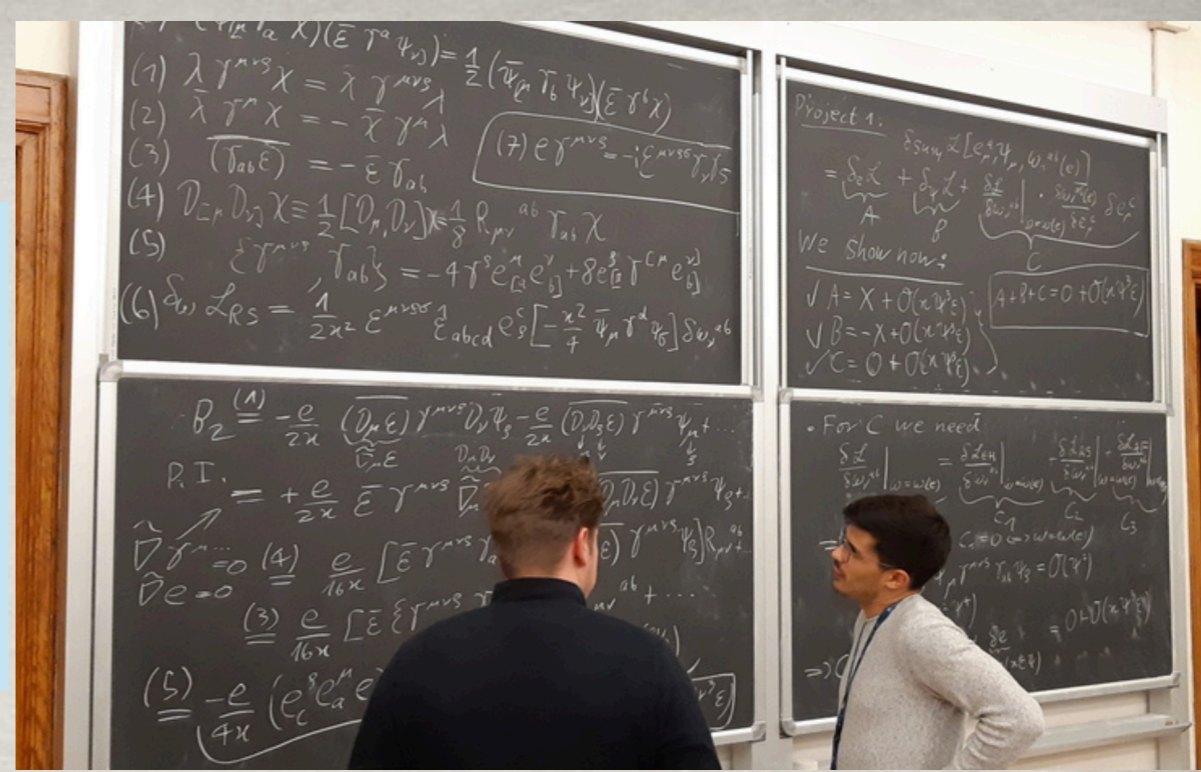


~60 students are selected for each school (approximately 40% foreigners) organised over 2-3 weeks of full immersion with lectures at the blackboard, and discussions in a very informal and stimulating atmosphere

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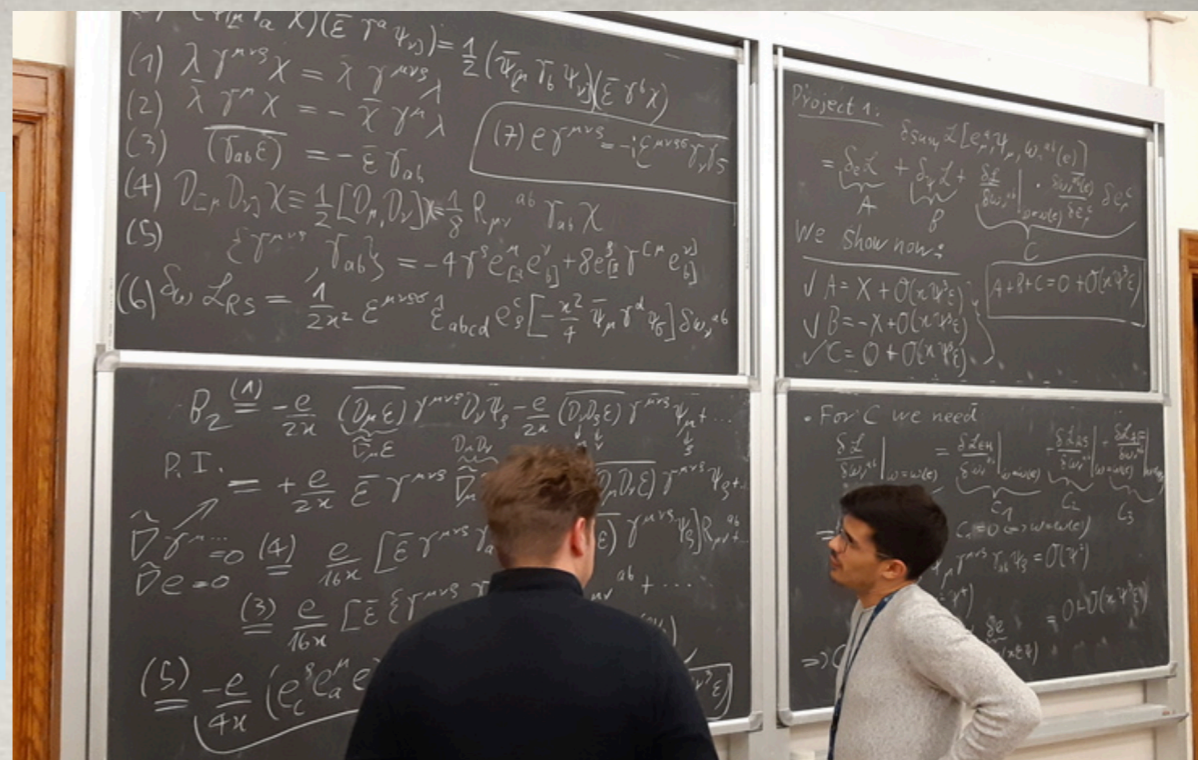
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All the lectures are video-recorded and available an archive of absolute value for young researchers!

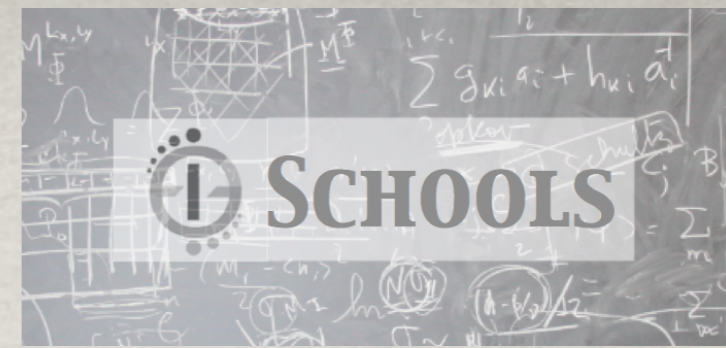


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Scuole di Dottorato al GGI

Attività 2023/2024



All the lectures are video-recorded → Galileo Galilei Institute (GGI) - YouTube

☑ **LACES 2023** (25 Nov - 13 Dic 2023)

organizzatori:

A. Bissi (Uppsala U.), D. Cassani (INFN, Padova), D. Francia (Univ. Roma3), **F. Galli (INFN Firenze)**, C. Maccaferri (Univ. of Torino), N. Makareeya (Univ. of Milano Bicocca)

☑ **GGI Lectures on the Theory of Fundamental Interactions 2024** (8-26 Jan 2024)

organizzatori:

F. D'Eramo (Univ. Padova & INFN), R. Franceschini (Roma3 U. & INFN), **D. Redigolo (INFN & Univ. Firenze)**, G. Ricciardi (Napoli U. & INFN), F. Riva (Geneve U.), **A. Tesi (INFN & Univ. Firenze)**

☑ **SFT 2024 - Lectures on Statistical Field Theory** (5-16 Feb 2024)

organizzatori:

P. Calabrese (SISSA, Trieste), J. Dubail (Lorraine U. Nancy), F. Essler (University of Oxford), C. Morais-Smith (University of Utrecht), A. Trombettoni (Univ. Trieste), J. Viti

☑ **Frontiers in Nuclear and Hadronic Physics** (26 Feb - 8 Mar 2024)

organizzatori:

A. Beraudo (INFN, Torino), I. Bombaci (Univ. & INFN, Pisa), A. Bonaccorso (INFN, Pisa), M. Colonna (LNS-INFN, Catania), V. Greco (Univ. & LNS-INFN, Catania), S. Scopetta (Univ. & INFN, Perugia), E. Santopinto (INFN, Genova), E. Vigezzi (INFN, Milano)

☑ **Theoretical Aspects of Astroparticle Physics, Cosmology and Gravitation** (11-22 Mar 2024)

organizzatori:

N. Bartolo (Padova), N. Fornengo (Torino), D. Grasso (Pisa), L. Gualtieri (Roma I), E. Lisi (Bari), G. Miele (Napoli)

Due to the importance of the interaction between the theoretical and experimental communities, we proposed **a new PhD school** providing lectures covering basic topics from a theoretical as well as experimental point of view on a proposed argument, and attended by **PhD students** selected among the **theoretical and experimental communities**

Call for 2023 "Theory meets Experiments" School Proposals

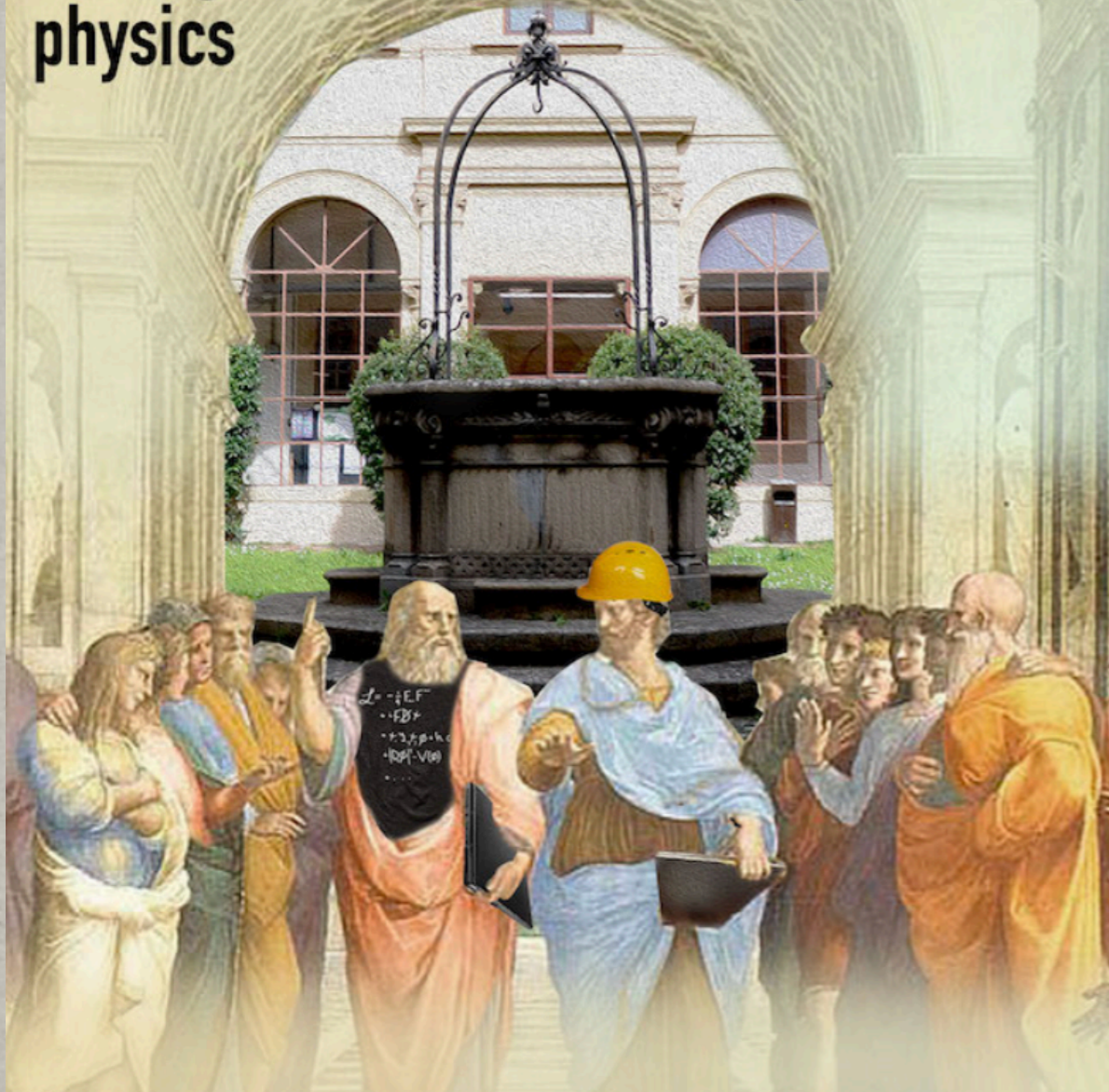
We received 6 VERY GOOD proposals on different topics

They were reviewed by a Committee formed by the Presidents of the INFN National Scientific Committees and the GGI Director and the one on **"The high intensity frontier of particle physics"** was selected

Nov 20 - 24, 2023

THEORY MEETS EXPERIMENTS

The high intensity frontier of particle physics



This school aims to prepare the next generation of physicists to leverage the opportunities provided by the upcoming high intensity accelerator programs. It will cover advanced topics in both experimental and theoretical physics as related to accelerators, and foster theory-experiment collaborations that they will need to design tomorrow's experiments and their physics program

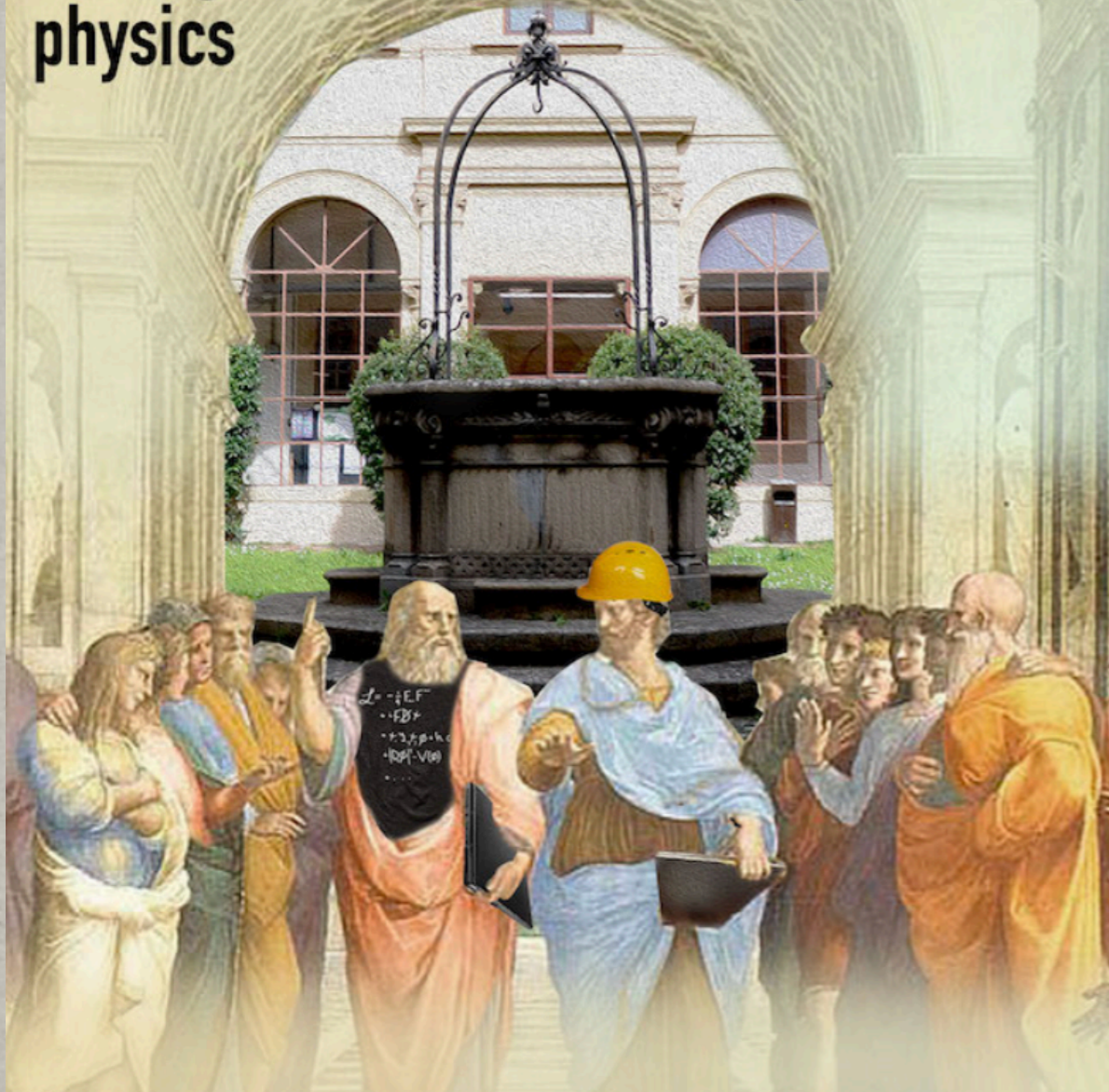
Speakers and Topics:

- | | |
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| • Matthew McCullough (CERN) | HL-LHC theory |
| • Luca Galli (INFN Pisa) | Low-E lepton experiments |
| • Simone Pagan Griso (LBNL) | HL-LHC experiments |
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Organizers:

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Supported by

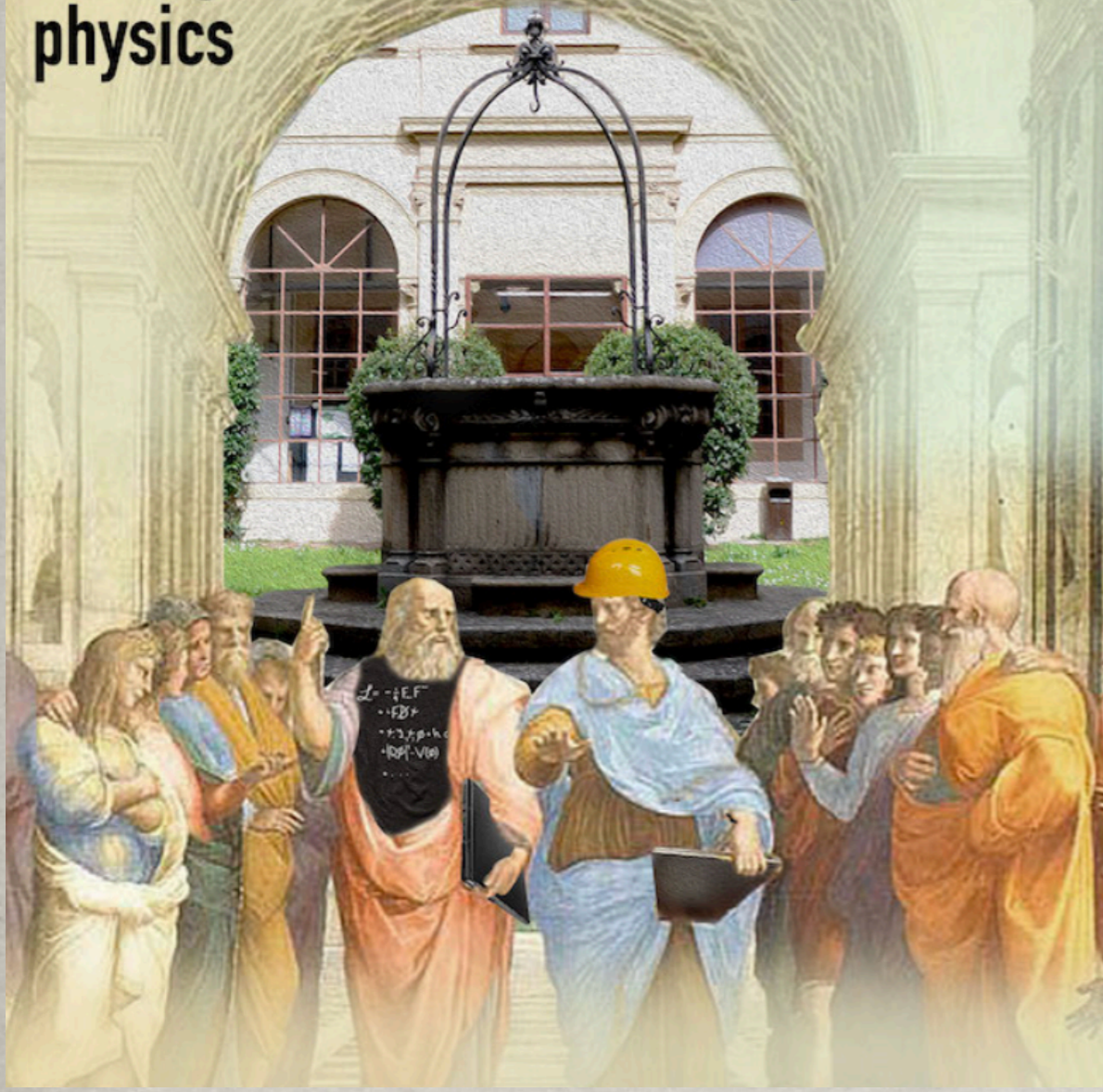
CSN1 and CSN4



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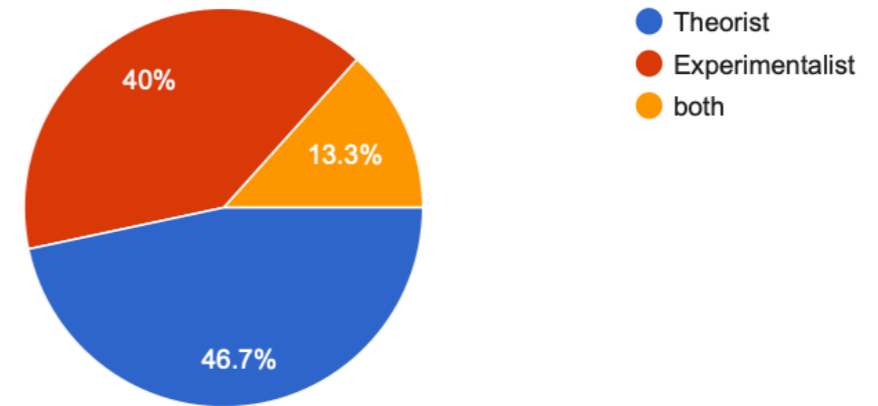
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30 responses



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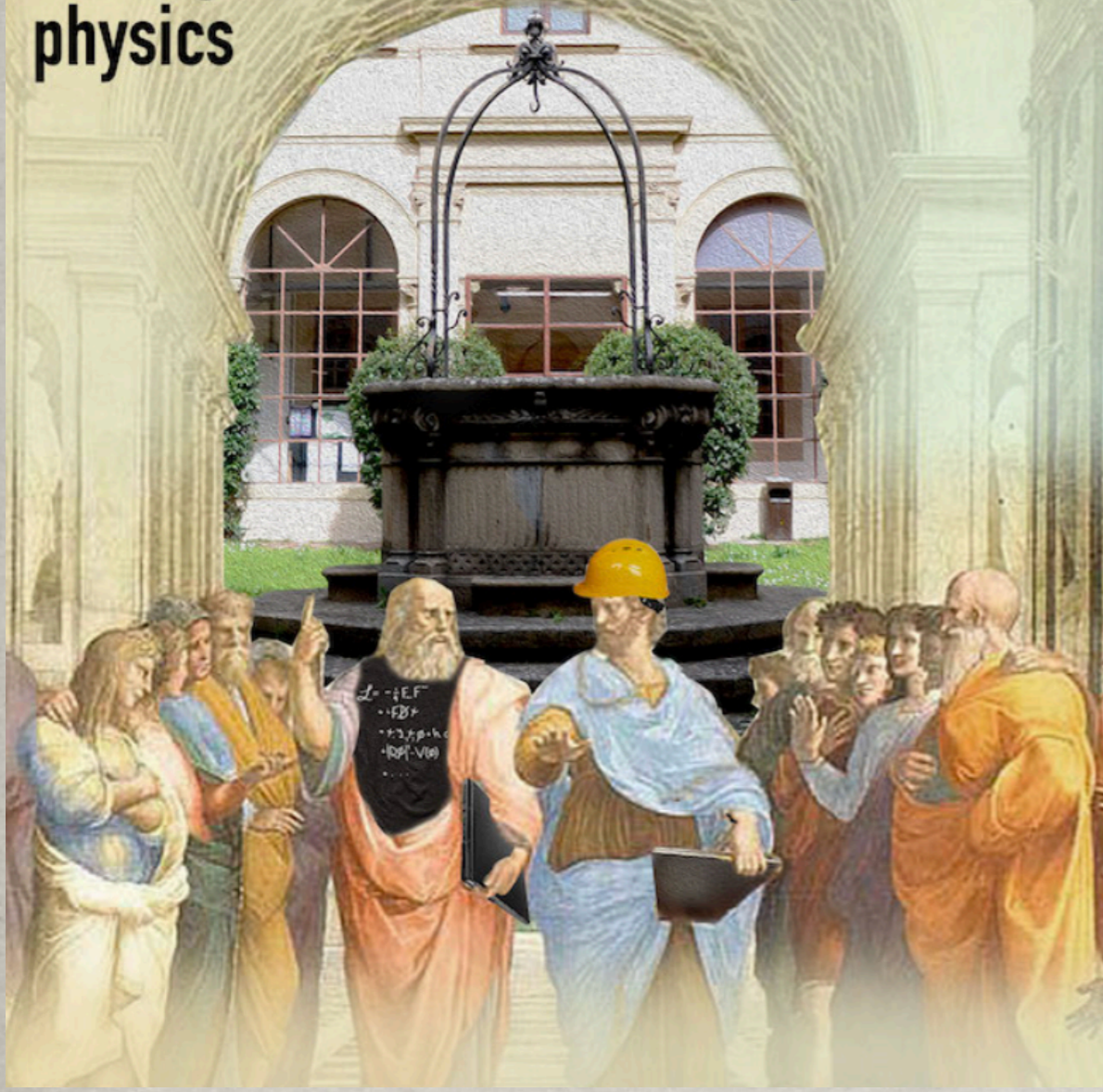
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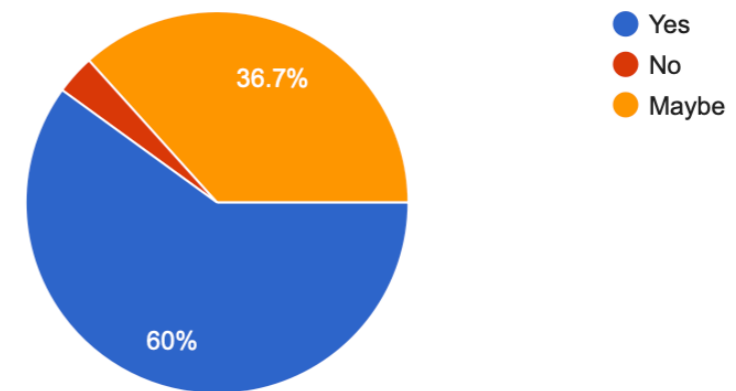
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Do you feel you developed new contacts or potential collaborations with students from the other side of the theory / experimental field?

30 responses



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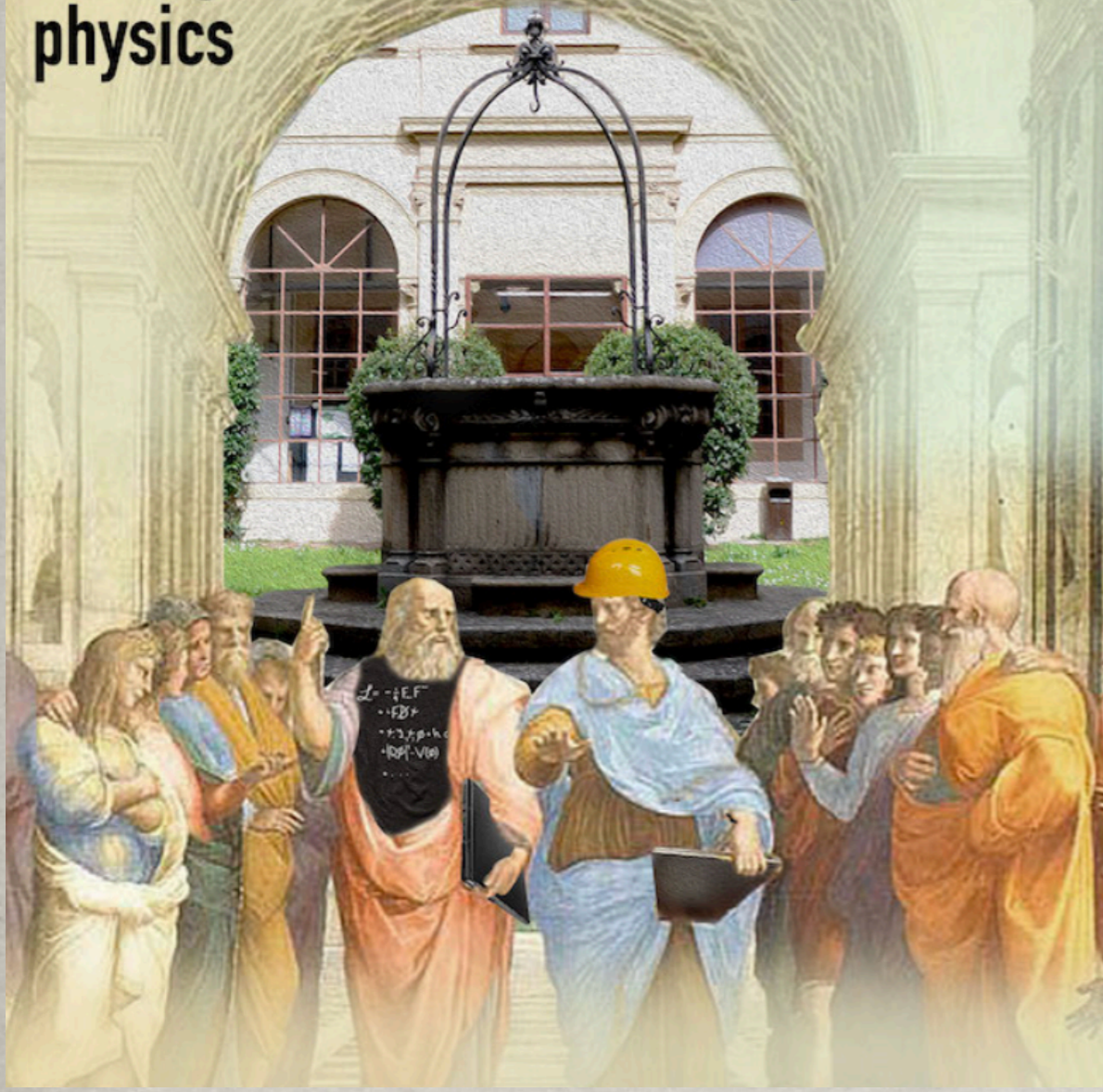
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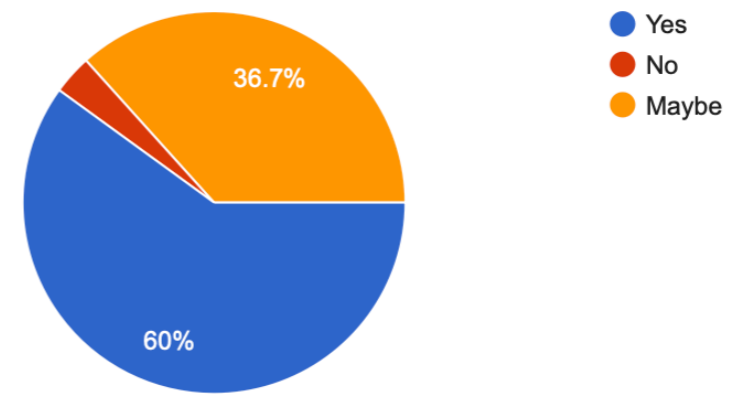
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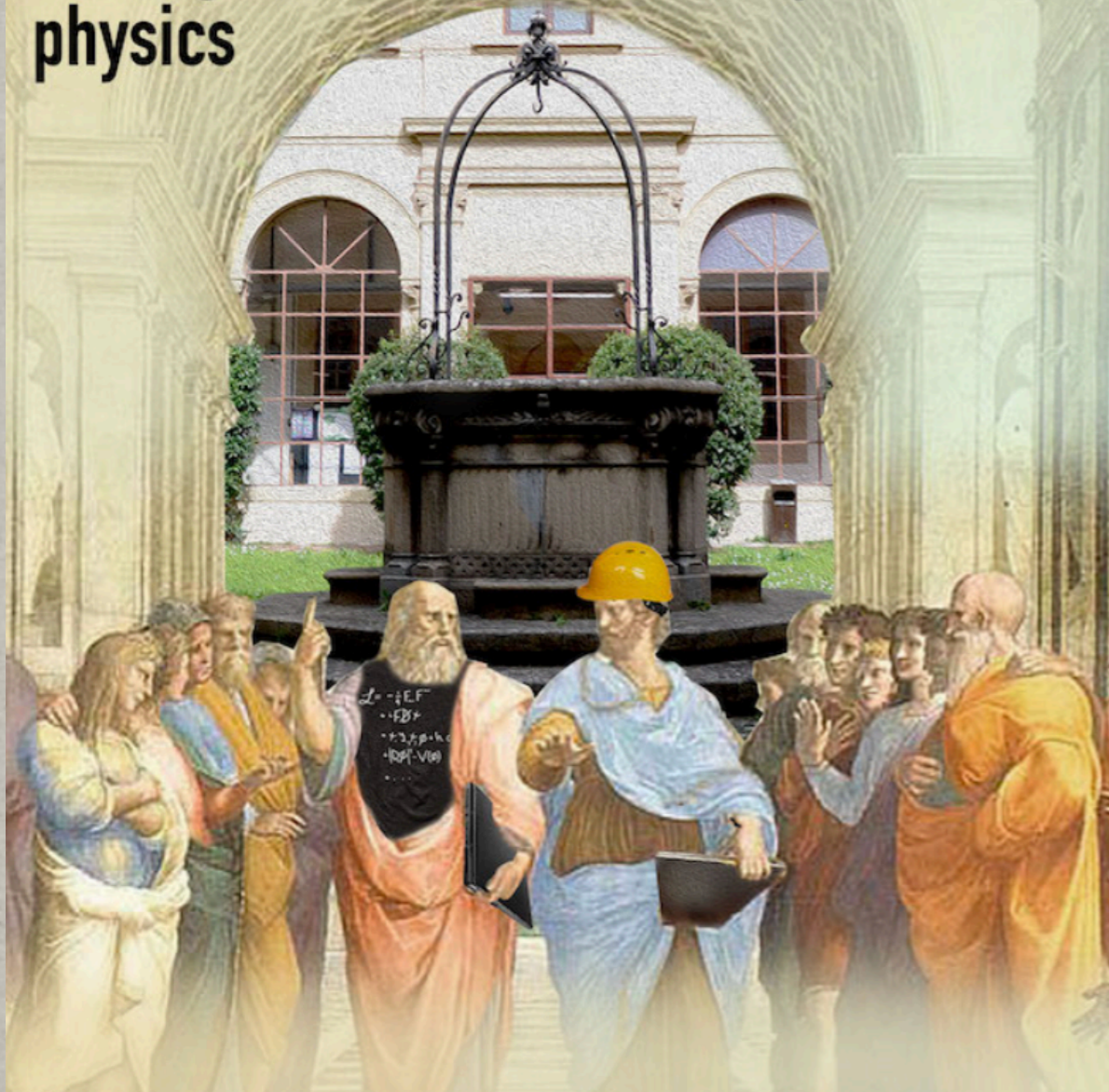


Call for 2024 "Theory meets Experiments" School Proposals

Nov 20 - 24, 2023

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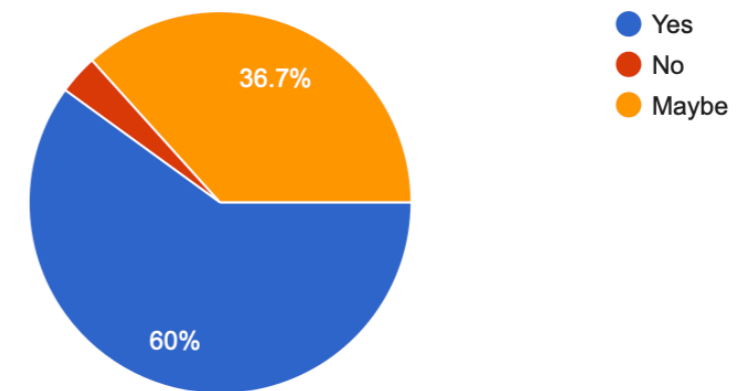
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dead-line May 31, 2024

Call for 2024 "Theory meets Experiments" School Proposals

GGI Workshops 2024

- **Resurgence and Modularity in Quantum Field Theory and String Theory** (April 8 - May 17, 2024)

Organizers: Daniele Dorigoni (Durham), Gerald Dunne (U.Connecticut), Alba Grassi (Cern, Geneva), Michael Green (DAMTP), Luca Griguolo (Univ. and INFN Parma), Sarah Harrison (Northeastern U.), Yasuyuki Hatsuda (Rikkyo), Axel Kleinschmidt (AEI Potsdam), Sameer Murthy (KCL), Anne Taormina (Durham)

Local Organizers: Li Gan (GGI)

- **BPS Dynamics and Quantum Mathematics** (May 20 - June 21, 2024)

Organizers: Cyril Closset (Birmingham University), Pietro Longhi (Uppsala University), Fabrizio Nieri (Turin University), **Domenico Seminara (University and INFN, Firenze)**, Katrin Wendland (Trinity College Dublin), Masahito Yamazaki (IPMU)

Local Organizers: Li Gan (GGI), Tiziano Schiavone (GGI)

- **Neutrino Frontiers** (June 25 - July 19, 2024)

Organizers: Olga Mena (Valencia U., IFIC), Francesco Vissani (INFN Italy), Maria Cristina Volpe (CNRS and APC Paris)

Local Organizer: Tiziano Schiavone (GGI)

- **Mathematical Structures in Scattering Amplitudes** (Aug 26 - Sept 27, 2024)

Organizers: N. Arkani-Hamed (Institute for Advanced Study, USA), R. Britto (Trinity College Dublin, Ireland), L. Ferro (University of Hertfordshire, UK), T. Lukowski (University of Hertfordshire, UK), L. Mason (University of Oxford, UK), M. Spradlin (Brown University, USA)

Local Organizers: Giordano Cintia (GGI)

GGI Workshops 2025

Call for 2025 Workshops - submitted by **January 31, 2024**
the GGI Scientific Committee selected 4 workshops out of 13 proposals

- **Foundations and Applications of Relativistic Hydrodynamics** (March 17 - April 18, 2025)

Organizers: Francesco Becattini, P Xu-Guang Huang, Jorge Noronha, **Natalia Pinzani-Fokeeva**, Dirk Rischke

- **From Asymptotic Symmetries to Flat Holography: Theoretical Aspects and Observable Consequences**

(May 12 - June 13, 2025)

Organizers: A. Campoleoni, L. Donnay, D. Francia, S. Pasterski, A. Puhm, S. Speziale

- **Exploring the energy frontier with muon beams** (June 23 - July 24, 2025)

Organizers: Scott Berg, Dario Buttazzo, Roberto Franceschini, Tova Holmes, Patrick Meade, Fabio Maltoni, Federico Meloni

- **New Physics from Galaxy Clustering at GGI** (Aug 25 - Oct. 3, 2024)

Organizers: Emanuele Castorina, Azadeh Moradinezhad, **Diego Redigolo**, Ennio Salvioni, **Marko Simonović**, Anže Slosar, Tomer Volansky



The Galileo Galilei Institute
For Theoretical Physics

The GGI has been awarded of the Simons Foundation Targeted Grant to Institutes

It is the second time that GGI wins the Simons funding call. The grant covers the next three years (2024-2027) with three different types of collaboration with the GGI activities:

1. the long-term visits by scientists,
2. the participation of eminent scientists in workshops organized at GGI,
3. the participation of young researchers, and doctoral students from institutions with limited funding.

Furthermore, a partnership is established for the development of the **Pollica Physics Centre**, a recently established institute which organizes theoretical and mathematical physics workshops.

Consiglio di Centro del GGI

Andrea Cappelli, Filippo Colomo, Francesco Bigazzi,
Domenico Seminara

GRAZIE al Gruppo Teorico Fiorentino !!