

MITP

# Mainz Institute of Theoretical Physics

Matthias Neubert, Director

3 June 2024



# Activities 2024

## Summary:

- 7 Scientific Programs (15)
- 7 Topical Workshops (7)
- Summer School (3)

⇒ **25 weeks**

Call for proposals for **MITP Youngst@r Workshops** will be opened soon

# ACTIVITIES 2024

[www.mitp.uni-mainz.de](http://www.mitp.uni-mainz.de)

## SCIENTIFIC PROGRAMS

### The Future of Fundamental Composite Dynamics: Colliders, Cosmology and Tools

Giacomo Cacciapaglia **IP2I Lyon**, Thomas Flacke **KIAS**, Abhishek Iyer **IIT Delhi** and Werner Porod **Univ. of Würzburg**,  
**March 4 – 15, 2024**

### Theory Facing Experiment on the Dark Matter and Flavor Puzzles

Marcela Carena **FNAL & Univ. of Chicago**, Gino Isidori **Univ. of Zurich**, Matthias Neubert **JGU Mainz**, and Giulia Ricciardi **Univ. of Naples Federico II**  
**June 10 – 21, 2024 Anacapri, Italy**

### Energy Correlators at the Collider Frontier

Carlota Andres Casas **Ecole Polytechnique**, Jack Holguin **Ecole Polytechnique**, Aditya Pathak **DESY**, and Massimiliano Procura **Univ. of Vienna**  
**July 8 – 19, 2024**

### Effective Theories for Nonperturbative Physics

Sebastian Schenk **JGU Mainz**, Carlos Tamarit **JGU Mainz**, and Felix Yu **JGU Mainz**  
**August 5 – 16, 2024**

### The Dark Matter Landscape: From Feeble to Strong Interactions

Mathias Becker **JGU Mainz**, Julia Harz **JGU Mainz**, Laura Lopez Honorez **Univ. Libre de Bruxelles**, Tracy Slatyer **Massachusetts Institute of Technology**, and Juri Smirnov **Univ. of Liverpool**  
**August 26 – September 13, 2024**

### Next Generation Perturbative QCD for Hadron Structure: Preparing for the Electron-Ion Collider

Taushif Ahmed **Univ. Regensburg**, Mathias Butenschön **Univ. Hamburg**, Alexey Vladimirov **Univ. Complutense Madrid**, and Pia Zurita **Univ. Regensburg**  
**October 21 – 31, 2024**

### Open Questions and Future Directions in Flavour Physics

Marzia Bordone **CERN**, Claudia Cornella **JGU Mainz**, and Joseph Davighi **Univ. of Zurich**  
**November 4 – 15, 2024**

## TOPICAL WORKSHOPS (+ 1 APPROVED)

### Modular Invariance Approach to the Lepton and Quark Flavour Problems: from Bottom-up to Top-down

Mu-Chun Chen **Univ. of California, Irvine** Ferruccio Feruglio **INFN-Padova**, Hans Hans Peter Nilles **Univ. of Bonn** and Serguey Petcov **INFN/SISSA-Trieste**  
**May 13 – 17, 2024**

### The Evaluation of the Leading Hadronic Contribution to the Muon $g-2$ : Consolidation of the MUonE Experiment and Recent Developments in Low-Energy $e^+e^-$ Data

Carlo M. Carloni Calame **INFN, Pavia**, Massimo Passera **INFN-Padova**, Luca Trentadue **Univ. di Parma**, and Graziano Venanzoni **Univ. of Liverpool & INFN-Pisa**  
**June 3 – 7, 2024**

### Geometry and Symmetries of SCFTs

Antoine Bourget **IphT Saclay**, Julius Grimminger **Oxford Univ.**, Amihay Hanany **Imperial College London**, Vishnu Jejjala **Univ. of the Witwatersrand**, and Hans Jockers **JGU Mainz**  
**June 17 – 21, 2024**

### Uncertainty Quantification in Nuclear Physics

Weiguang Jiang **JGU Mainz**, Joanna Sobczyk **JGU Mainz**, Christian Drischler **Ohio Univ.**, and Takayuki Miyagi **TU Darmstadt**  
**June 24 – 28, 2024**

### Isospin-Breaking Effects on Precision Observables in Lattice QCD

Thomas Blum **UConn**, Marina Marinkovic **ETH Zurich**, Harvey B. Meyer **JGU Mainz**, and Hartmut Wittig **JGU Mainz**  
**July 22 – 26, 2024**

### Towards the Detection of Diffuse Supernova Neutrinos: What Will We See? What Can We Learn?

Shunsaku Horiuchi **Virginia Tech**, Yu-Feng Li **IHEP Beijing**, Irene Tamborra **Niels Bohr Institute, Copenhagen**, Mark Vagins **Univ. of Tokyo**, and Michael Wurm **JGU Mainz**  
**September 16 – 20, 2024**

## MITP SUMMER SCHOOL

### Crosslinks of Early Universe Cosmology

Julia Harz **JGU Mainz**, Carlos Tamarit **JGU Mainz**, and Felix Yu **JGU Mainz**  
**July 15 – August 2, 2024**



# Summer School 2024

## MITP Theory Summer School

- Erbacher Hof in Mainz
- Organized by Julia Harz, Carlos Tamarit and Felix Yu



MITP  
SUMMER  
SCHOOL

15 July – 2 August



## CROSSLINKS OF EARLY UNIVERSE COSMOLOGY

**Dark Matter**  
Torsten Bringmann | University of Oslo

**Multimessenger Physics**  
Mauricio Bustamante | NBI, University of Copenhagen

**Gravitational Waves**  
Daniel Figueroa | IFIC Valencia

**Phase Transitions**  
Oliver Gould | Nottingham University

**Baryogenesis and Leptogenesis**  
Seyda Ipek | University of Carleton

**Neutrinos**  
Joachim Kopp | JGU Mainz / CERN

**Thermal Field Theory**  
Mikko Laine | University of Bern

**Non-standard Cosmological Relics**  
Javier Redondo | Zaragoza University

**Cosmology Basics – the Homogeneous and Inhomogeneous Universe**  
Yvonne Wong | University of New South Wales

2024

Organized by  
Julia Harz, Carlos Tamarit and Felix Yu | JGU Mainz

<https://indico.mitp.uni-mainz.de/event/381/>  
▶ [www.mitp.uni-mainz.de](http://www.mitp.uni-mainz.de)



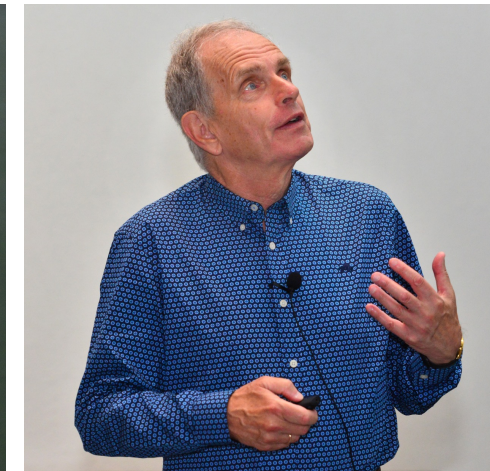
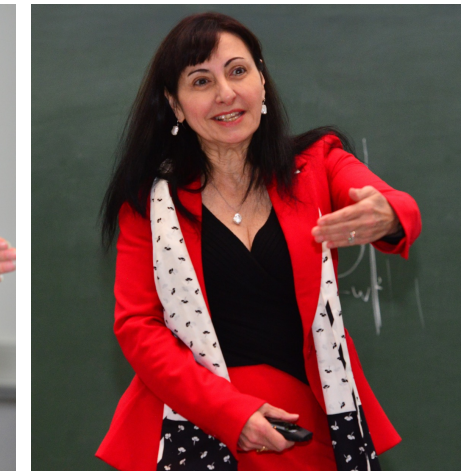




# Photo impressions



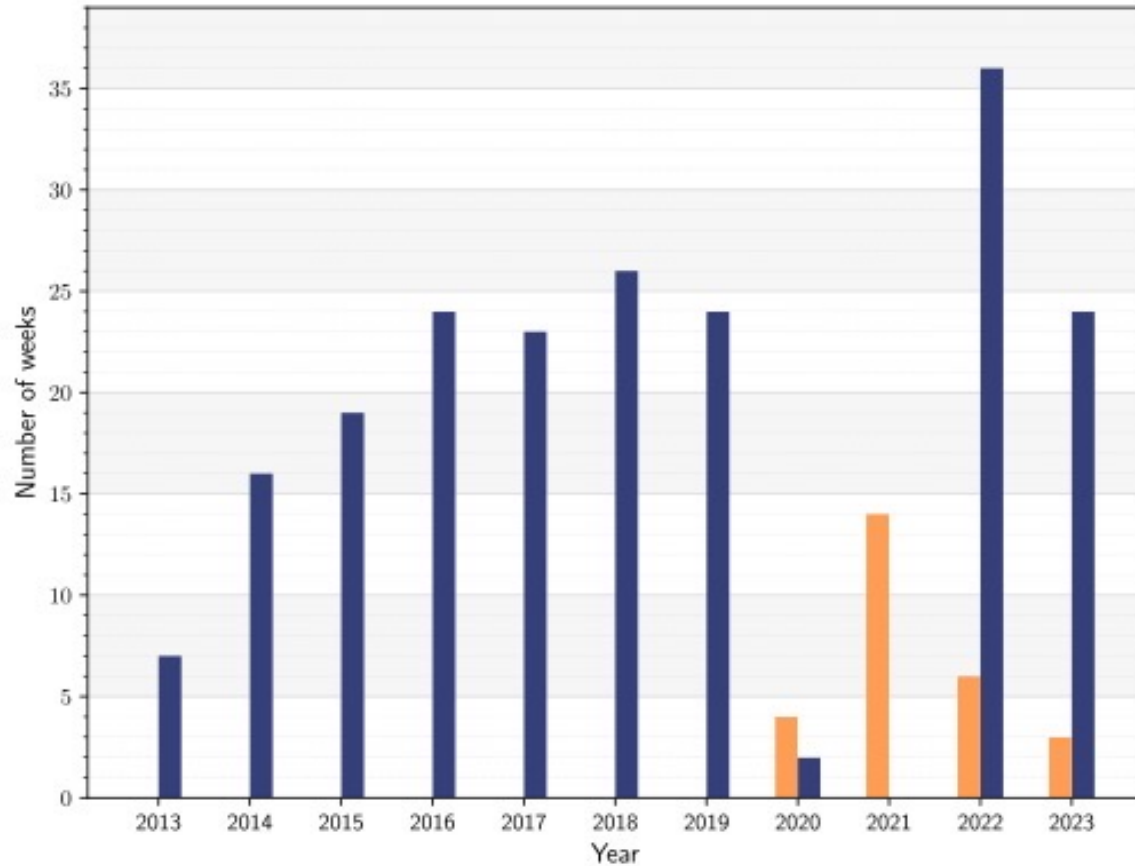




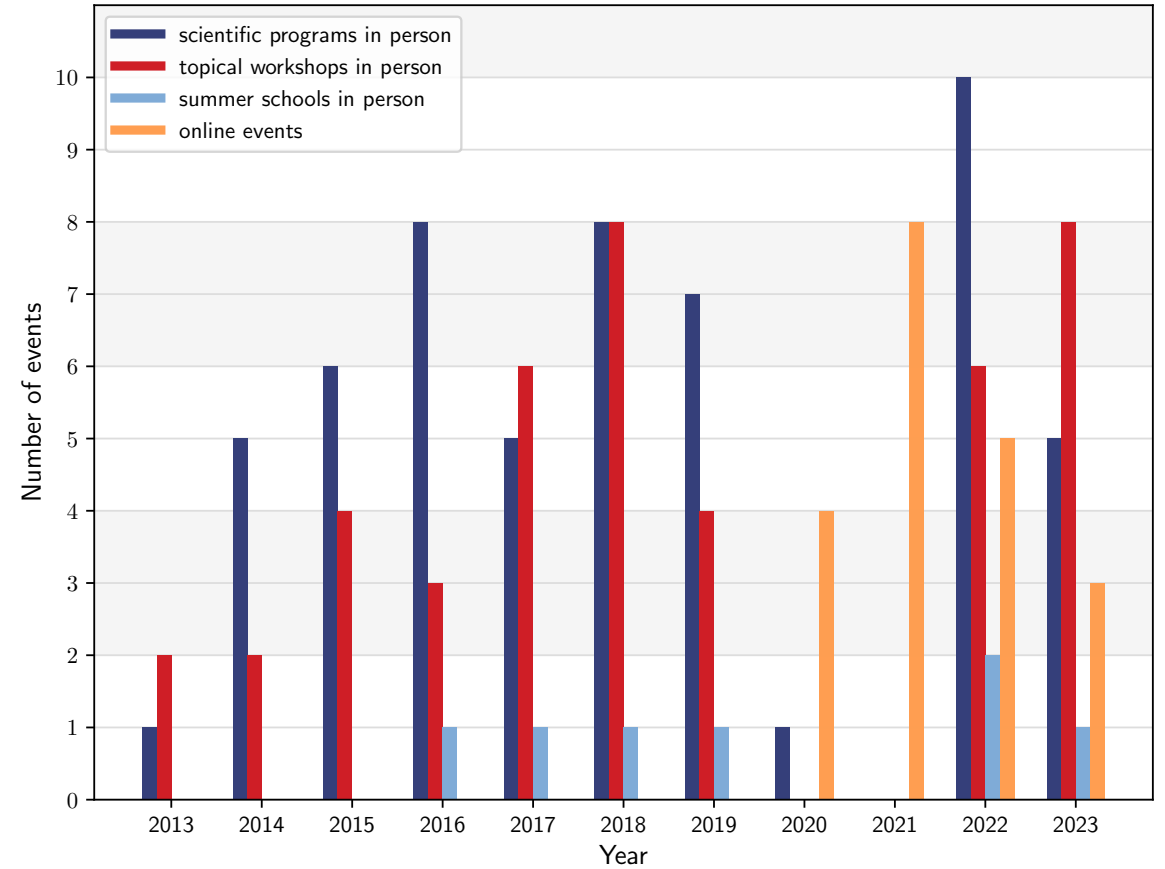


# Event statistics

Number of weeks with **virtual**/in-person events



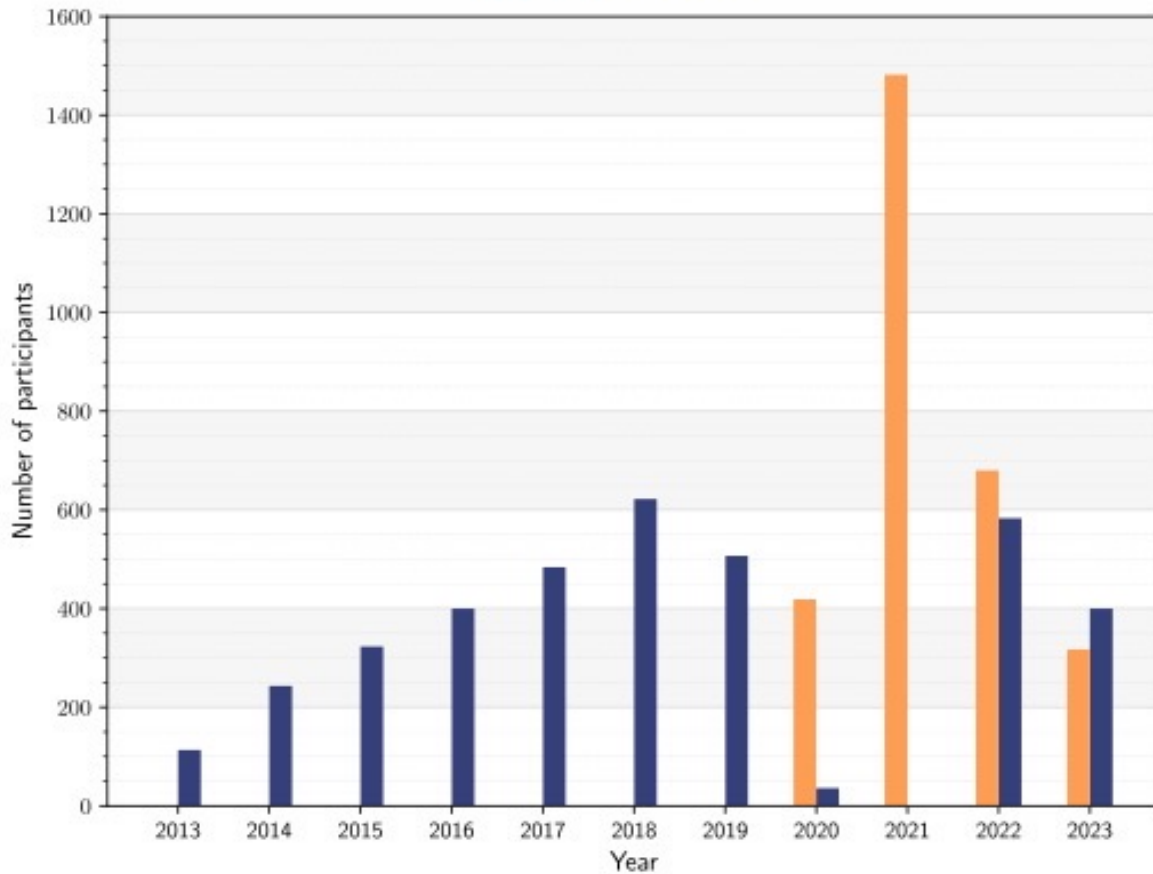
Number of events



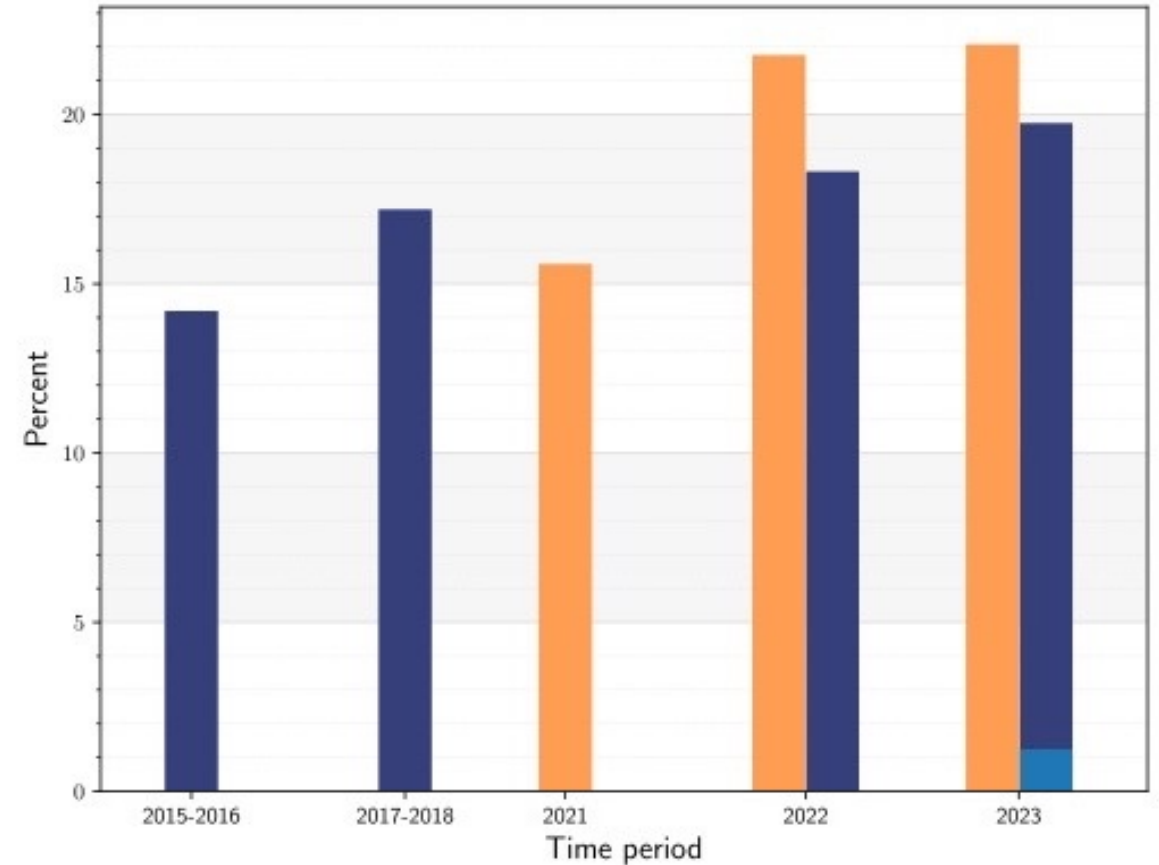


# Participants and gender diversity

Number of **virtual**/in-person participants



Percentage of women/**unlabeled gender** participants in **virtual**/in-person meetings



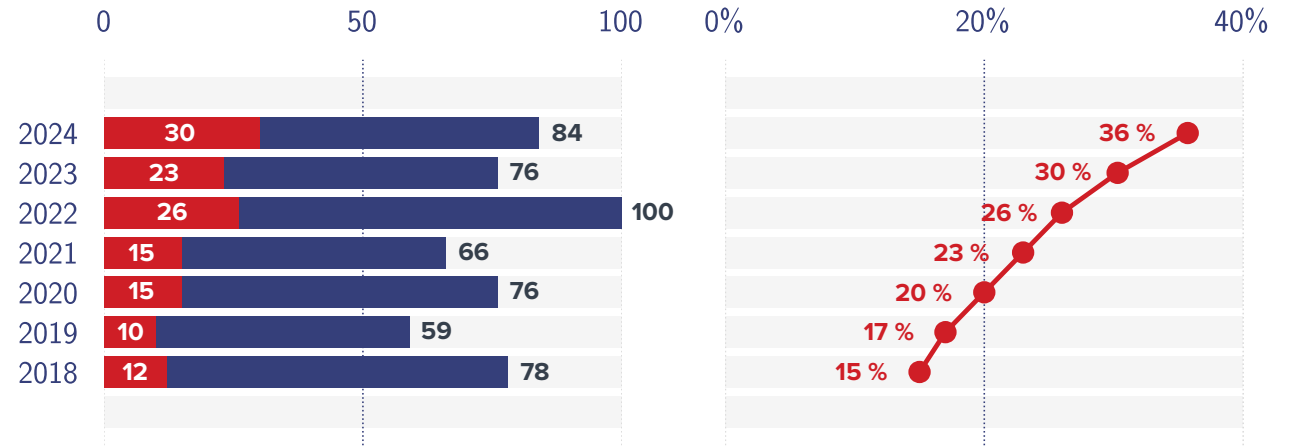


# Gender diversity

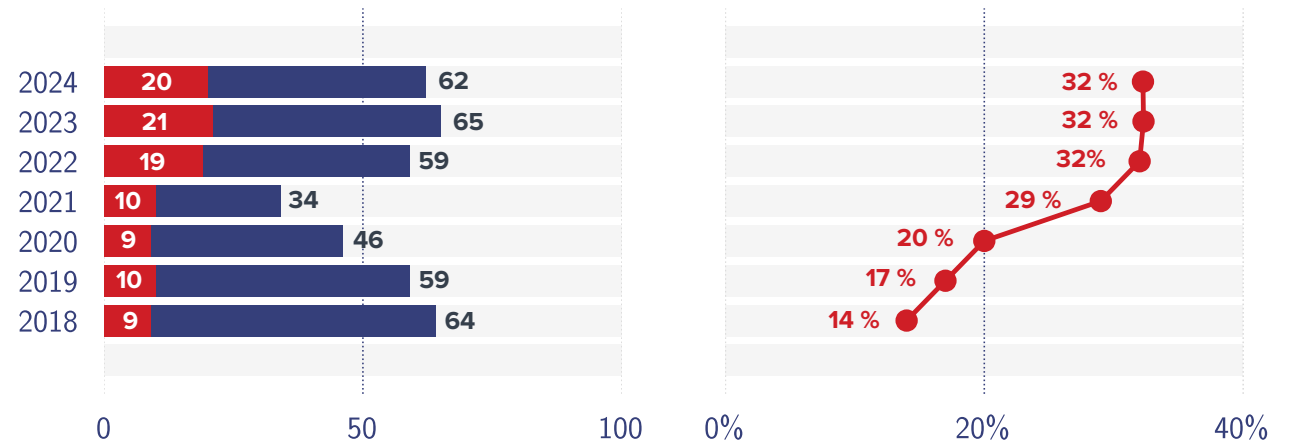
## Applications procedure

- Designation of a **diversity coordinator** among organizers
- **Diversity plan** to ensure that under-represented groups (women, young scientists, scientists from less developed regions) are not overlooked in the invitation process (since 2020)
- Strong encouragement to engage more **female organizers**

Organizers: # Total #Female % Female  
 Proposal level: female organizers



Approved proposals: female organizers

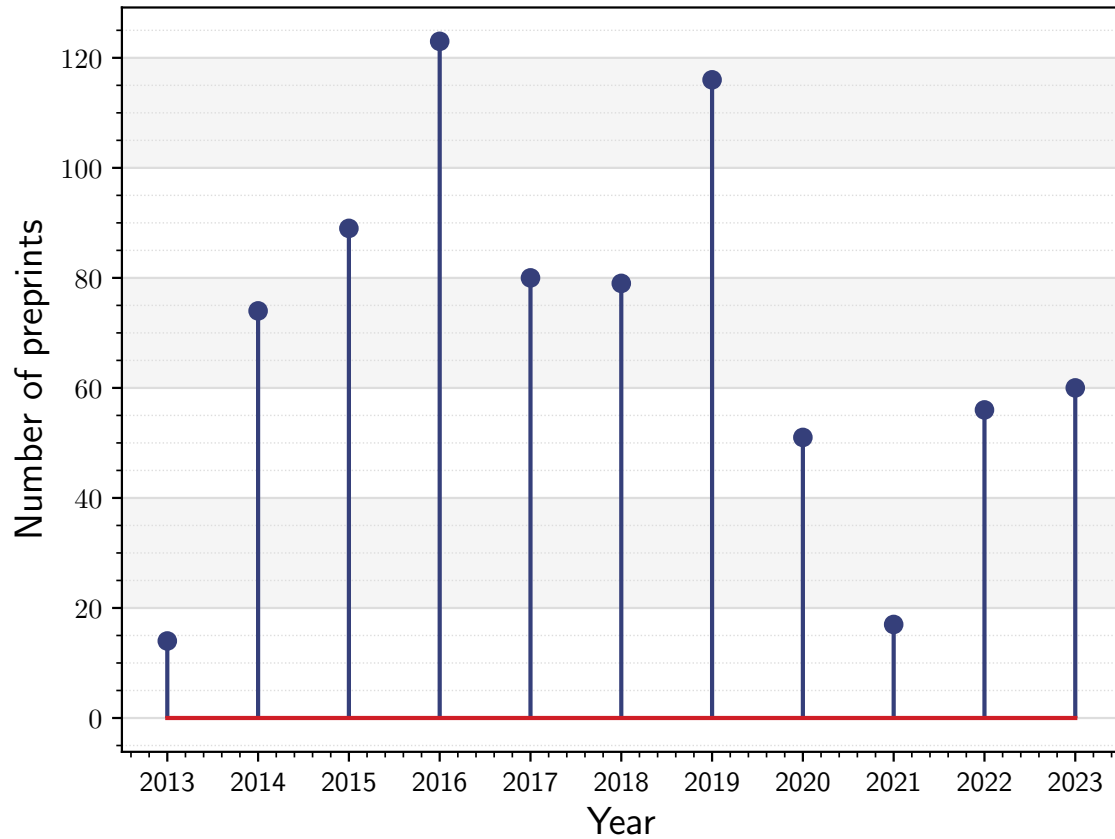




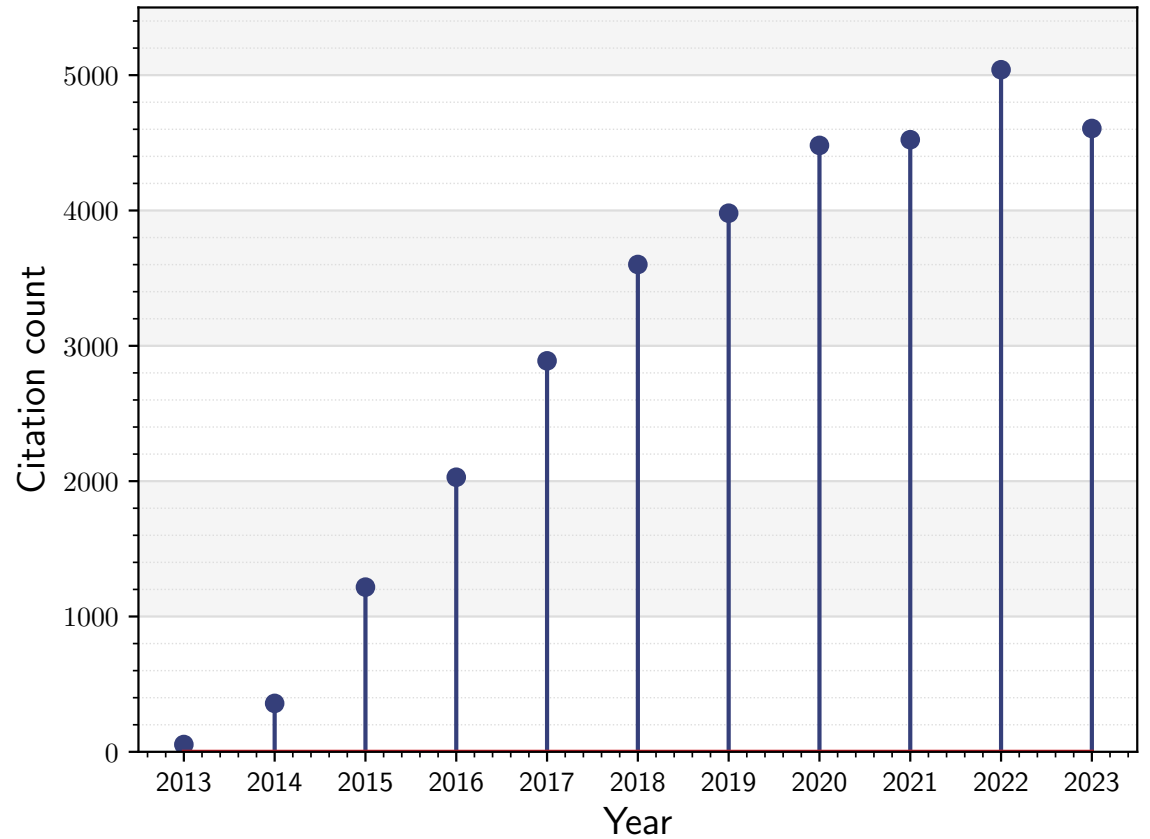


# Research at MITP

## Number of preprints acknowledging MITP



## Citations of preprints acknowledging MITP



# MITP Senior Postdoctoral Fellows

Targeted at experienced postdocs of exceptional ability, who show a high potential for becoming future scientific leaders

- Nomination by a faculty member or senior researcher
- Unique career development opportunities at a leading theory center
- Access to all MITP scientific activities offers networking opportunities not available at other institutions
- Significant research funds (10 k€/year) for travel, workshops, collaboration meetings, equipment, etc.
- Active faculty mentoring program



# MITP Senior Postdoctoral Fellows

Term 2022 – 2025



**Ida Ghazvini Zadeh**

ICTP, Trieste, Italy  
(Mathematical Physics)

*Lecturer, Univ. Southampton  
since April 2024*

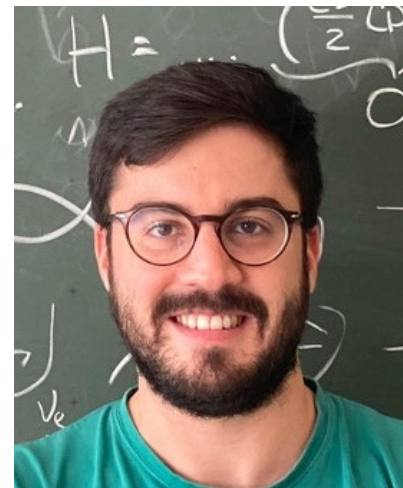
Term 2022 – 2025



**Weiguang Jiang**

Chalmers University,  
Gothenburg, Sweden  
(Nuclear Physics)

Term 2024 – 2027



**Marco Fedele**

IFIC, Valencia, Spain  
(Quark Flavor Physics)

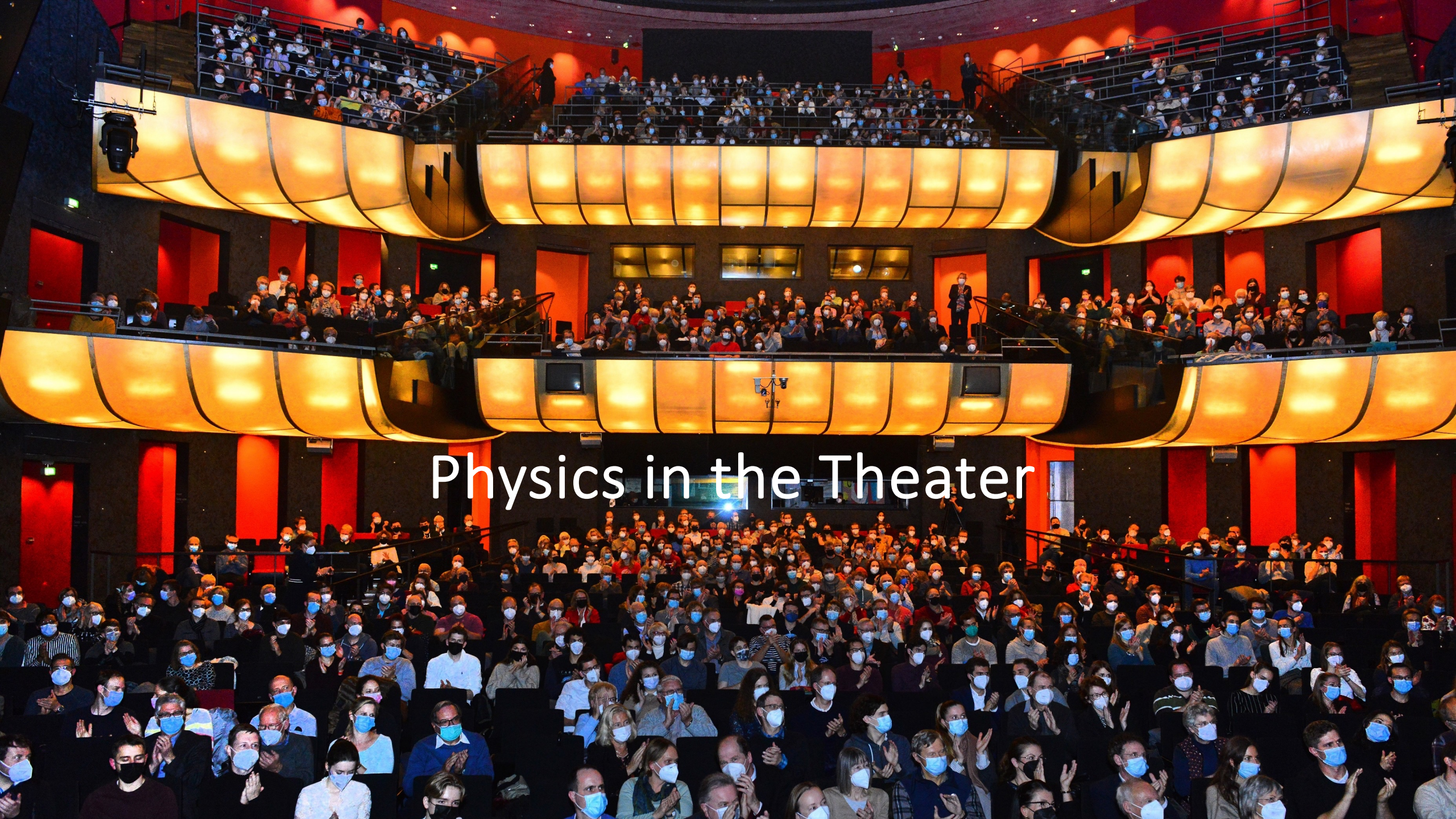
Term 2024 – 2027



**Yann Gouttenoire**

Tel Aviv University, Israel  
(Cosmology)





# Physics in the Theater



# Physics in the Theater

**28. Januar 2024, 18:00 Uhr, Kleines Haus**

**Forschung, Lehre, weiter so? Akademische Wissenschaft in der Klimakrise**

Prof. Dr. Sebastian Seiffert | Johannes Gutenberg-Universität Mainz

**24. März 2024, 19:00 Uhr, Großes Haus**

**Wiederaufladbare Batterien – Was bringt die Zukunft?**

Prof. Dr. Alexej Jerschow | New York University, USA

**1. Juni 2024, 18:00 Uhr, Kleines Haus**

**Beben in der Raumzeit: Mit Gravitationswellen von Schwarzen Löchern bis zum Urknall**

Prof. Dr. Kai Schmitz | Universität Münster

**7. September 2024, 18:00 Uhr, Kleines Haus**

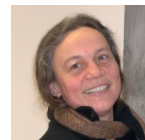
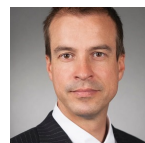
**70 Jahre CERN: ein europäisches Labor für Wissenschaft, Technologie und Frieden**

Prof. Dr. Beate Heinemann | DESY, Hamburg

**2. Dezember 2024, 18:00 Uhr, Kleines Haus**

**Rätsel und Ungereimtheiten im kosmologischen Standardmodell**

Prof. Dr. Ruth Durrer | Universität Genf



## Physik im Theater

Öffentliche Vortragsreihe im  
Staatstheater Mainz



**29. Januar 2023, 18:00 Uhr, Kleines Haus**

**DAS GEHEIMNIS DER WOLKEN**

Prof. Dr. Dr. h.c. Eberhard Bodenschatz |  
Max-Planck-Institut für Dynamik und Selbstorganisation Göttingen



**14. Mai 2023, 18:00 Uhr, Kleines Haus**

**Das James Webb Weltraum Teleskop:  
Vom ersten Blick bis zu neuen Planeten**

Prof. Mark McCaughrean | European Space Agency



**9. September 2023, 18:00 Uhr, Kleines Haus**

**Das Rätsel der dunklen Materie**

Prof. Dr. Julia Harz | Johannes Gutenberg-Universität Mainz



**19. November 2023, 18:00 Uhr, Kleines Haus**

**Wie Kocht man Neutronensterne?**

Prof. Dr. Laura Fabietti | Technischen Universität München (TUM)

2023





MITP

Thank you for your  
support and loyalty!

  
Mainz Institute for  
Theoretical Physics