

Matteo Pais

Curriculum Vitæ

INAF - Istituto Nazionale di Astrofisica
Osservatorio Astronomico di Padova, Padova, Italy
✉ matteo.pais@inaf.it

Personal Details

Date of birth: 3rd September 1991

Civil status: Single

Citizenship: Italian

Employment

Postdoctoral researcher 2024 - present

INAF, Observatory of Padua, Padua (PD), Italy - PI: Dr. Riccardo Ciolfi

PRIN funded project

Postdoctoral researcher 2020 - 2024

Hebrew University of Jerusalem (HUJI), Jerusalem, Israel - PI: Prof. Tsvi Piran

ERC Advanced Grant funded projects **Multijets** and **TReX**

Education

Ph.D. (Dr. Rer. Nat.) in Physics 2016-2020

University of Heidelberg (MPIA - HITS), Leibniz Institute for Astrophysics Potsdam (AIP)

- Ph.D. thesis title: *Magneto-hydrodynamic simulation with cosmic rays acceleration at supernova remnants*
- Supervisor: Prof. Christoph Pfrommer
- Co-Advisor: Prof. Ralf Klessen
- 2nd co-advisor/Thesis committee advisor: Prof. Volker Springel

M.Sc. in Physics (Laurea Magistrale) 2013-2016

University of Cagliari, Italy

- M.Sc. thesis title: *Inflation as De Sitter Instability*
- Supervisor: Prof. Mariano Cadoni
- Final grade: 110/110 cum laude

B.Sc. in Physics (Laurea Triennale) 2010-2013

University of Cagliari, Italy

- B.Sc. thesis title: *Kerr Black Holes*
- Supervisor: Prof. Mariano Cadoni
- Final grade: 110/110 cum laude

Fellowships & Awards

Postdoctoral fellowship declined

Yukawa Institute for Theoretical Physics (YITP), Kyoto

4-year postdoctoral fellowship 2020-2024

The Hebrew University of Jerusalem (HUJI)

Ph.D. Diploma certificate/ fellowship 2016-2020

International Max Planck Research School Heidelberg (IMPRS-HD)

Teaching

Tutor 2017
University of Heidelberg (Rupert-Karls Universität Heidelberg), Germany
◦ Graduate course *General relativity*

Tutor 2014
University of Cagliari, Italy
◦ Undergraduate course *Laboratory of Physics*

Institutional Responsibilities

Organizer and co-chair of the weekly Astrophysics seminars of the Racah Institute of Physics, Hebrew University of Jerusalem **Jan 2022 - July 2023**

Reviewing Activities

Referee for ApJ 2023-present

Research Interests & Collaborations

High-Energy Astrophysics & Plasma Physics:

- Hebrew University, Jerusalem, Israel (*Piran*)
- Ben Gurion University, Beer Sheva, Israel (*Lyubarsky*)
- Tel Aviv University, Israel (*Nakar*)
- Max Planck Institute for Gravitational Physics, Potsdam, Germany - Yukawa Center, Kyoto University, Japan (*Kiuchi, Shibata*)
- Tokyo University, Tokyo, Japan (*Hotokezaka, Irwin*)
- Leibniz Institute for Astrophysics, Potsdam, Germany (*Pfrommer*, during Ph.D.)

Collaborations:

- SCEECS Collaboration (Simons Foundation) - PI: *Roger D. Blandford* 2023 -
- TCAN Collaboration (external collaborator via Piran) - PI: *Emanuela Campanelli* 2022 - 2023

Academic References

- Prof. Tsvi Piran (Hebrew University of Jerusalem) tsvi.piran@mail.huji.ac.il
- Prof. Christoph Pfrommer (AIP Potsdam, Potsdam University) cpfrommer@aip.de
- Prof. Mariano Cadoni (INFN, University of Cagliari) mariano.cadoni@ca.infn.it

Presentations

CONFERENCES & WORKSHOPS:

Invited plenary talk	<i>CNOC XIII, Congresso Nazionale Oggetti Compatti</i> Alghero, Italy	09/2024
Invited talk	<i>17th Marcel Grossmann meeting</i> Pescara, Italy	07/2024
Talk	<i>EAS 2024 Meeting</i> Padua, Italy	07/2024
Invited Seminar	<i>INAF, Trieste</i> Trieste, Italy	05/2024

Invited Seminar	<i>Yukawa Institute for Theoretical Physics (YITP)</i> Kyoto, Japan	12/2023
Talk	<i>32nd Texas Symposium</i> Shanghai, China	12/2023
Invited seminar	<i>INAF, Padua</i> Padua, Italy	11/2023
Talk (opted out)	<i>High Energy Phenomena in Relativistic Outflows VIII (HEPRO VIII)</i> Paris, France	10/2023
Talk	<i>TeV Particle Astrophysics (TeVPA)</i> Napoli, Italy	09/2023
Invited Seminar	<i>Tokyo - KAVLI IPMU Seminar</i> Kavli IPMU Tokyo	06/2022
Invited Seminar	<i>Astrophysical Seminar</i> Hebrew University	10/2021
Talk	<i>Workshop on Astrophysical Shocks</i> Potsdam, Germany	03/2018

POSTER CONTRIBUTION:

Poster	<i>32nd Texas Symposium - Shanghai, China</i>	2023
Poster	<i>Black Holes, from Theory to Observations - Tel Aviv, Israel</i>	2023
Poster	<i>Unsolved problems in Astrophysics - Jerusalem, Israel</i>	2023
Poster	<i>Supernova Remnants II - Chania, Greece</i>	2019
Poster	<i>Thinkshop on Galaxy Formation - Potsdam, Germany</i>	2018

Summer schools

- DIAS Summer School in High Energy Astrophysics, Dublin, Ireland **2018**
- NBIA School on Plasma Physics, Niels Bohr Institute, Copenhagen, Denmark **2017**

Publications

1. **M. Pais**, T. Piran, K. Kiuchi, M. Shibata - Simulating short GRB jets in realistic late binary neutron star merger environments - *The Astrophysical Journal*, accepted for publication, 2024, 25 pp.
2. **M. Pais**, T. Piran, Y. Lyubarsky, K. Kiuchi, M. Shibata - The collimation of relativistic jets in post-binary neutron star merger simulations - *The Astrophysical Journal Letters*, Volume 946, Issue 1, id.L9, 2023, 7 pp.
3. **M. Pais**, T. Piran, E. Nakar - The velocity distribution of outflows driven by choked jets in stellar envelopes - *Monthly Notices of the Royal Astronomical Society*, Volume 519, Issue 2, pp.1941-1954
4. **M. Pais**, C. Pfrommer - Simulating TeV gamma-ray morphologies of shell-type supernova remnants - *Monthly Notices of the Royal Astronomical Society*, Volume 498, Issue 4, pp.5557-5573
5. G. Winner, C. Pfrommer, P. Girichidis, M. Werhahn, **M. Pais** - Evolution and observational signatures of the cosmic ray electron spectrum in SN 1006 - *Monthly Notices of the Royal Astronomical Society*, Volume 499, Issue 2, pp.2785-2802

6. **M. Pais**, C. Pfrommer, K. Ehlert, M. Werhahn, G. Winner - Constraining the coherence scale of the interstellar magnetic field using TeV gamma-ray observations of supernova remnants - Monthly Notices of the Royal Astronomical Society, Volume 496, Issue 2, pp.2448-2461
7. **M. Pais**, C. Pfrommer, K. Ehlert, R. Pakmor - The effect of cosmic-ray acceleration on supernova blast wave dynamics - Monthly Notices of the Royal Astronomical Society, Volume 478, Issue 4, August 2018, pp. 5278–5295