

Tristan Hoellinger

JPL Postdoctoral Fellow · Cosmology · NASA/Caltech

Professional Positions

2026–2030 **Postdoctoral Fellow in Cosmology**, [Jet Propulsion Laboratory](#), NASA/Caltech
Expertise: Field-level Inference, Observational Cosmology. PIs: [Olivier Doré](#) and [Dida Markovic](#).

Membership · International Collaborations

2023– **Euclid Consortium**, *active role in the ILI-GC-DR1 project (PI: D. Bartlett)*.
2023– **Aquila Consortium**, *active role in monthly meetings and bi-annual workshops*.

Leadership

2025 **Member, Committee against harassment and discrimination**, IAP, Paris
2024, 2025 **Local Organizing Committee (LOC)**, **Aquila Workshops**, IAP, Paris
2023–2024 **Organizer**, *weekly meetings with invited colloquium speakers*, IAP, Paris
2024 **Outreach workshop at the Fête de la Science 2024**, IAP, Paris
2023 **Member of the Paris LOC**, [ML-IAP/CCA conference](#), Hybrid IAP/Flatiron, New York

Grants & Awards

2023 Sorbonne "Politique Scientifique" PhD Fellowship; sole recipient in Astrophysics ($\sim\text{€}100\text{k}$).
2016–2020 Undergraduate scholarships: merit-based & social criteria ($\sim\text{€}7\text{k}/\text{year}$).

Education

2023–2026 **PhD in Astronomy & Astrophysics**, [Institut d'Astrophysique de Paris](#), Sorbonne Université
Advisors: [Florent Leclercq](#) and [Guilhem Lavaux](#).
2016–2022 **MSc in Applied Mathematics & MSc in Hybrid AI**, *First-Class*, [N7](#) & [INSA Toulouse](#), France
2019–2020 **Academic Exchange in Fundamental Physics**, Paris-Saclay University

Teaching

2023–2025 **140 hours on-site, Third year BSc Mathematics**, Sorbonne University

Selected Talks

Invited 2026 **Invited Seminar**, *SCAI – The Sorbonne Cluster for AI*, Paris, France
Trustworthy AI for Cosmology: Auditable Inference & Hybrid Solvers, 45 min.

Invited 2025 **Invited Seminar**, *Observatoire Astronomique*, Strasbourg, France
Implicit Likelihood Cosmological Inference: Simulations & Diagnostics, 45 min.

2025 **Les Houches on Dark Universe**, *Les Houches School of Physics*, Les Houches, France
Accurate Small-Scale Dynamics in COLA, 20 min.

Invited 2025 **Cosmology & Gravitation Seminar**, *Oskar Klein Centre (OKC)*, Stockholm, Sweden
Addressing Systematic Effects in Implicit Cosmological Inference, 30 min.

Invited 2025 **Cosmology Group Meeting**, *Institute of Cosmos Science (ICC)*, Barcelona, Catalonia, Spain
Diagnosing systematic effects in field-based, implicit likelihood cosmological inference, 40 min.

2024 **X Meeting on Fundamental Cosmology**, *Universidad de Sevilla*, Seville, Spain
Lightening black-box models in field-based implicit likelihood cosmological inference, 15 min.

Publications

- ★ in prep Faster high-fidelity P3M gravity boosted with tCOCA, **Hoellinger** et al., in prep.
- ★ in prep Fast high-fidelity P3M gravity boosted with tCOLA, **Hoellinger** et al., in prep.
- ★ 2025 **Diagnosing systematic effects using the inferred initial power spectrum**, **Hoellinger** and Leclercq, *A&A* **699**, A224 (2025); [arXiv:2412.04443](https://arxiv.org/abs/2412.04443).
- ★ 2025 **A vorticity confinement correction for DG schemes applied to fluid flow problems**, **Hoellinger**, Manueco, and Chapelier, *IJNMHFF* (2025), [10.1108/hff-11-2024-0854](https://doi.org/10.1108/hff-11-2024-0854), [[open-access](#)].
- ★ 2023 **Enhancer/gene relationships: Need for more reliable genome-wide reference sets**, **Hoellinger** et al., *Frontiers in Bioinformatics* **3** (2023), [10.3389/fbinf.2023.1092853](https://doi.org/10.3389/fbinf.2023.1092853).
- 2020 **Data-Driven Simulation for Augmented Surgery**, Mendizabal et al.,
Co-author *Advanced Structured Materials* **132** (Springer), [10.1007/978-3-030-50464-9_5](https://doi.org/10.1007/978-3-030-50464-9_5).

Open-Source Software

- SelfiSys **Principal developer** and maintainer of SelfiSys, a Python package for diagnosing systematic effects in forward models of galaxy surveys, with [full documentation](#) and [examples](#). **Selected to audit the euclid_forward pipeline** for ILI with Euclid DR1 galaxy clustering data (*ILI-GC-DR1*; PI: D. Bartlett).
- Simbelmynë A hierarchical probabilistic simulator to generate synthetic galaxy survey data. I **lead the development of a fast P3M gravity module**, to be open-sourced in a next release. Principal developer: F. Leclercq.

Interdisciplinary Research Projects

- 2022–2023 **Master's Thesis**, *ONERA - The French Aerospace Lab*, Châtillon
DG schemes for massively parallel direct simulation of turbulent fluid dynamics. Advisor: [J.-B. Chapelier](#).
- 2020–2022 **Junior Bioinformatics Scientist**, *Inserm*, Toulouse
Statistical methods to map enhancers to their target genes in human genomes. Advisor: [S. Djebali](#).
- 2021 **Visiting**, *Centre for Genomic Regulation*, Barcelona
A pipeline to find genetic variants linked to intron retention in blood cells. Advisor: [D. Garrido](#).
- 2020 **Research Intern**, *Toulouse Mathematics Institute*, Toulouse
Stochastic calculus, quantum nondemolition measurements. Advisors: [T. Benoist](#) and [C. Pellegrini](#).
- 2020 **Research Intern**, *IRAP*, Toulouse, Theoretical study of kinetic scale plasma turbulence. Advisor: [P. Louarn](#).
- 2019 **Research Intern**, *Inria*, Strasbourg, Deep learning for data-driven surgery. Advisor: [A. Mendizabal](#).

References

Upon request.