Paolo Suin

Postdoctoral Researcher | CEA Saclay, France
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Languages: Italian (native), English (fluent), French (intermediate)

Research positions

2025–present **Postdoctoral Researcher**, Département d'Astrophysique, CEA Saclay, France
Advisor: Patrick Hennebelle
ERC Synergy Grant ECOGAL

Education

2022–2025 **Ph.D. in Astrophysics**
Aix-Marseille Université / LAM, France | Supervisor: Annie Zavagno
Thesis: *High-mass stars' feedback impact on star-formation properties*

2018–2022 **M.Sc. in Physics** (Astronomy & Astrophysics), 110/110 *cum laude*
Università di Pisa, Italy | Supervisor: Steven N. Shore
Thesis: *Environmental effects on the dynamical evolution of star clusters in turbulent molecular clouds*

2015–2018 **B.Sc. in Physics**, 110/110 *cum laude*
Università di Pisa, Italy | Supervisor: Pier Giorgio Prada Moroni
Thesis: *Stellar evolution in close binary systems*

Research interest keywords

- Star-forming structures: clouds, filaments, clumps, and cores
- Feedback from massive stars and H II regions
- RMHD simulations (ISM and molecular clouds)
- Star-formation-rate/gas-density relation
- Stellar dynamics in young clusters

Major collaborations

2026–present **Panta Rei** (PIs: Peretto, Traficante, Merello, Clarke): member of ALMA Large Programme simulation and observations groups studying dynamical flows feeding clumps/cores.

2022–present **ECOGAL**, ERC Synergy Grant (PI: Molinari, Hennebelle, Klessen, Testi): member of the medium-scale group, focusing from kiloparsec scales to star-forming cores

2024–present **Rosetta Stone Project** (Coordinator: A. Traficante): End-to-end comparison of simulations and observations of star-forming clumps.

2023–present Collaboration with D. Arzoumanian (NAOJ) on magnetic fields and filamentary structure

Grants and awards

2024 Visiting Joint Research Grant, National Astronomical Observatory of Japan (241,000 JPY)

Conferences and workshops

Accepted talks *IAU Symposium 412: Hub-Filament Systems*, Mysuru, India (2026, forthcoming);
Interstellar Institute 8, Paris, France (2026);
UK Star Formation 2026, Cardiff, England (2026);
ESO – CMF2IMF Workshop, Garching, Germany (2026);

Posters	*Stellar Origin*, Vienna, Austria; *Star Formation, Stellar Feedback, and Ecology of Galaxies*, Visegrád, Hungary (2025); *Star@Lyon*, Lyon, France (2024).
Invited seminars	ECOGAL seminar series (2026); National Astronomical Observatory of Japan, Japan (2024) Università di Pisa, Italy (2023); ECOGAL seminar series (2023); University of Cologne, Germany (2022)

Technical competences

Languages	`C/C++`, `Python`, `Fortran`, `bash`;
Astrophysical codes	`RAMSES` (AMR), `Gadget-2` (SPH), `PeTar` (*N*-body), `AMUSE` (multi-physics), `POLARIS` (radiative transfer);
Data analysis & Tools	`yt`, `Aladin`, `DS9`, `numba`, `Git`, `Hyper-Py`, `DisPerSE`;

Teaching activities

2026	Teaching assistant, Les Houches Summer School, "From the Interstellar Medium to the Formation of Stars: Physics, Tools and Methods"; Project: *Structure-finding tools*. Daily three-hour classes for Ph.D. students (15 hours of a 60-hour project)
2020–2021	Teaching assistant, first-year Physics Laboratory course, Università di Pisa Weekly two-hour classes for undergraduate students (40 hours)

Student mentoring

2025–2026	Informal mentoring of a PhD student (CEA) on numerical simulations and analysis of star-forming molecular clouds.
2024–2025	Informal mentoring of a Master's student (University of Pisa) on numerical simulations of *N*-body simulations.

Reviewing activity

2023–present	Referee for Nature Communications, Monthly Notices of the Royal Astronomical Society, and Astronomy & Astrophysics

Schools and advanced training

2026	*From the Interstellar Medium to the Formation of Stars*, Les Houches – Four weeks.
2024	*The physics of star formation*, Les Houches – Two weeks.
2021	*Modest-21a: AMUSE* – One week
2019	*Spectro Party*, Observatoire de Haute-Provence – One week
2018	*PLAS@PAR Summer School*, Sorbonne Université – One week

Institutional responsibilities and outreach

2026–present	Organiser of the Interstellar SeMinar international series.
2023–2025	Organiser of the "Coffee Club" seminar series, Laboratoire d'Astrophysique de Marseille
2022–2025	Participation in European Researchers' Night outreach event.
2018–2020	Organiser of Pint of Science in Pisa, featuring researchers' talks for the general public.

Publications (first author)

1. *What sets the star-formation rate in the Milky Way? II. Comparing the star-forming clumps from simulations and observations*
   P. Suin, P. Hennebelle, G. Abboudeh, D. Elia, S. Molinari, E. Schisano, N. Brucy, S. Glover, U. Lebreuilly, S. Mercimek, A. Nucara, V.-M. Pelkonen, J. D. Soler, A. Traficante, R. S. Klessen, L. Testi
   Accepted on A&A (2026).

2. *The impact of system configuration on early radiative feedback in star-forming molecular clouds*
   P. Suin, A. Zavagno, P. Hennebelle, A. Nucara, A. Traficante, S. Reissl
   Submitted to A&A (2026).

3. *The role of magnetic field and stellar feedback in the evolution of filamentary structures in collapsing star-forming clouds*
   P. Suin, D. Arzoumanian, A. Zavagno, P. Hennebelle
   A&A, 698, A119 (2025).

4. *Stellar feedback in the star formation–gas density relation: comparison between simulations and observations*
   P. Suin, A. Zavagno, T. Colman, P. Hennebelle, A. Verliat, D. Russeil
   A&A, 682, A76 (2024).

5. *Environmental effects on the dynamical evolution of star clusters in turbulent molecular clouds*
   P. Suin, S. N. Shore, V. Pavlík
   A&A, 667, A69 (2022).

Other publications

1. *What sets the star-formation rate in the Milky Way? I. A multi-scale view of the star-formation rate*
   P. Hennebelle, **P. Suin**, G. Abboudeh, E. Schisano, N. Brucy, T. Colman, D. Elia, P. Girichidis, S. Glover, R. S. Klessen, U. Lebreuilly, S. Mercimek, S. Molinari, A. Nucara, V.-M. Pelkonen, J. D. Soler, A. Traficante, L. Testi
   Submitted to A&A, 2026.
   Contribution: Contributed to the simulation design, data analysis, and physical interpretation of the results.

2. *Predicting Continuum Emission in Massive Star-Forming Regions with Embedded H II Regions: Dust, Free–Free, and Anomalous Microwave Emission with POLARIS*
   S. Reissl, A. Traficante, **P. Suin**, A. Nucara, R. S. Klessen, L. Testi
   Accepted on A&A, 2026.
   Contribution: Designed and ran the simulations, contributed to the interpretation and writing of the manuscript.

3. *Linking multi-scale magnetic field morphology and fragmentation properties in the G11.11-0.12 infrared dark cloud*
   A. Nucara, T. G. S. Pillai, A. Traficante, S. Molinari, G. A. P. Franco, V.-M. Pelkonen, U. Lebreuilly, S. Mercimek, C. Mininni, J. Kauffmann, R. S. Klessen, S. Leurini, J. D. Soler, I. W. Stephens, **P. Suin**, L. Testi, Q. Zhang
   Submitted to A&A, 2026.
   Contribution: Participated in discussions comparing the observed magnetic-field morphology and fragmentation with numerical simulations.

4. Chapter in the SKAO science-case volume: *The 10–15 GHz radio continuum survey of the Galactic Plane with SKAO*
   A. Traficante, . . . , **P. Suin**, et al. [66 authors]
   Advancing Astrophysics with the SKA II, arXiv:2606.26278 (2026).
   Contribution: Led the development and writing of Section 4: "Insights from modelling and simulations".

5. *MXDFz4.4: A LyC Emitter 250 Myr after the Epoch of Reionization and a First Test of Lyα Morphology as a Tracer of LyC Escape at High Redshift*
   I. Goovaerts, M. Rafelski, A. Beckett, G. Oyarzún, A. Citro, F. Hasan, K. V. Nedkova, C. Hawcroft, A. M. Koekemoer,

M. Revalski, M. J. Hayes, C. Scarlata, R. A. Lucas, N. A. Grogin, D. V. Stark, **P. Suin**, N. Pirzkal, L.-G. Strolger
ApJ, 100, 3 (2026).
Contribution: Provided physical insights into the role of clustered star formation and gas clearing in facilitating ionising photon escape, helping interpret the JWST observations.

6. Chapter in the PRIMA science-case volume: *Characterizing the interplay between Galactic star formation and ionization feedback with PRIMA*
A. Zavagno, D. Russeil, **P. Suin**, S. Zhang, R. K. Yadav, M. Figueira, L. Berthelot, D. Arzoumanian, M. R. Samal, V. Rawat, P. André, M. Mattern, H.-L. Liu, S. Sadavoy, P. Nozari, B. Epinat
JATIS, 11, 031636 (2025).
Contribution: Led the discussion connecting observations with numerical feedback models.

7. *The Rosetta Stone project. III. ALMA synthetic observations of fragmentation in high-mass star-forming clumps*
A. Nucara, . . . , **P. Suin**, et al. [26 authors]
A&A, 701, A219 (2025).
Contribution: Contributed to discussions on the comparison between synthetic observations and observational data.

8. *The Rosetta Stone project. I. A suite of radiative magnetohydrodynamics simulations of high-mass star-forming clumps*
U. Lebreuilly, A. Traficante, A. Nucara, N.-D. Tung, P. Hennebelle, S. Molinari, R. S. Klessen, L. Testi, V.-M. Pelkonen, M. Benedettini, A. Coletta, D. Elia, C. Mininni, S. Pezzuto, J. D. Soler, **P. Suin**, C. Toci
A&A, 701, A217 (2025).
Contribution: Contributed to discussions on the simulation framework and physical interpretation of the results.