ANDREI MESINGER

Full Professor of Astrophysics and Cosmology
Department of Physics and Astronomy "Ettore Majorana"
University of Catania, Catania, Italy
andrei.mesinger@dfa.unict.it |
https://andreimesinger.github.io

PROFILE

Astrophysicist and cosmologist working on the first billion years of the Universe: First Light and reionization, high-redshift galaxies and quasars, the nature of dark matter, and the cosmological 21-cm signal, using efficient simulators, machine learning and simulation-based inference. Creator of the public 21cmFAST code, ERC Starting Grant PI, and Executive Board member of HERA and of the SKA Epoch of Reionization and Cosmic Dawn Science Team.

PROFESSIONAL EXPERIENCE

PERIOD	POSITION / INSTITUTION
2025–	Full Professor of Astrophysics and Cosmology, University of Catania
2020–2025	Associate Professor, Scuola Normale Superiore (SNS), Pisa
2017–2020	Senior Research Professor (RTD-B; direct ERC StG appointment), SNS, Pisa
2011–2017	Junior Research Professor, SNS, Pisa
2008–2011	Hubble Fellow, Department of Astrophysical Sciences, Princeton University
2006–2008	Postdoctoral Fellow, Physics Department, Yale University and UCLA
2002–2006	Graduate Research Fellow, Astronomy Department, Columbia University
2001–2002	Research Assistant, Small Bodies Node, Astronomy Department, University of Maryland

EDUCATION

- 2006 — Ph.D. in Astronomy, Columbia University, With Distinction. Thesis: "Probing Reionization and Early Structure Formation" (advisor: Zoltan Haiman).
- 2005 — M.Phil. and M.A. in Astronomy, Columbia University.
- 2002 — B.S. in Astronomy, University of Maryland at College Park, Cum Laude.
- 2002 — B.S. in Computer Engineering, University of Maryland at College Park, Magna Cum Laude.

HONOURS

- 2019 — ERC Consolidator Grant finalist (stage 2: grade A).
- 2017 — National Science Habilitation (ASN), rank: full professor.
- 2015–2021 — ERC Starting Grant Award.
- 2014 — National Science Habilitation (ASN), rank: associate professor.
- 2008–2011 — Hubble Prize Fellowship (NASA).
- 2006 — Doctoral Thesis Distinction, Columbia University.
- 2005–2006 — NASA Graduate Student Research Program (GSRP) Fellowship.
- 1997–2002 — National Merit Finalist; Maryland Distinguished Scholar; Banneker/Key Scholarship.

PUBLICATION PROFILE

>250 publications since 2004 (>190 refereed)
>15,000 citations; >3,500 citations normalized by author number
h-index 69; i10-index 173; i100-index 46
Source: NASA ADS (updated October 2026)

BOOKS

- Understanding the Epoch of Cosmic Reionization: Challenges and Progress (Springer, 2016), ISBN 9783319219578
- The Cosmic 21-cm Revolution: charting the first billion years of our Universe (IOP, 2019), ISBN 9780750322348

SCIENTIFIC LEADERSHIP AND SERVICE TO THE COMMUNITY

- Executive Board Member, Hydrogen Epoch of Reionization Array (HERA), 2015–.
- Executive Board Member, SKA Epoch of Reionization and Cosmic Dawn Science Team, 2015–.
- Chair, SKA Reionization and Cosmic Dawn Science Working Group, 2019–2024 (member since 2013).
- Working Group Member: Italian SKA Science Group (2021–); MOSAIC ELT SWG1 "First Light Galaxies and the Reionization of the Universe" (2021–); ATHENA SWG3 (2016–).
- Grant panelist: FCT Physics panels (2012, 2018, 2019, 2020, 2022); NSF Cosmology panels (2011, 2013).
- Expert reviewer for 12 funding agencies (2008–), including ERC, NSF, ARC, ANR, NWO, SNSF and FAPESP.
- Editorial Board Member, Journal of Astrophysics (Hindawi), 2013–2017.
- Journal referee since 2004, including Science, Nature Astronomy, PRL, A&A, MNRAS, ApJ and JCAP.

RESEARCH SOFTWARE

- Designer and creator of DexM and 21cmFAST (2007–), public semi-numerical codes simulating the early Universe; used by researchers in more than 29 countries.
- Designer and creator of 21CMMC, public inference code for 3D multi-tracer fields.
- Creator and administrator of the 21cmFAST collaboration: https://github.com/21cmfast

SELECTED PEER-REVIEWED GRANTS / PROJECTS

25 peer-reviewed grants and allocations since 2005; 14 as PI or co-PI, totalling >€2M in research funding and >60 million supercomputing core-hours; co-I on NSF HERA awards totalling >US$17M.

PERIOD	PROJECT	ROLE / AWARD
2023–2026	MUR PRIN — Optimal inference from radio images of the epoch of reionization	PI / national coordinator; €217,415
2022–2024	PRACE EuroHPC — Forward modeling the first billion years	PI; 10,000,000 core hours
2022–2023	MUR PRO3 — Data Science methods for Multi-Messenger Astrophysics and Cosmology	co-PI; €232,500
2020–2021	Chandra Cycle 21 — A local characterization of the z~10 X-ray field and its effects on the IGM	co-I; 509 ks
2019–2020	PRACE Tier-0 — Artificial intelligence for 21cm cosmology (AIfor21CM)	PI; 20,000,000 core hours
2019–2020	ESO — XQR-30: the ultimate XSHOOTER legacy survey of quasars at $z \simeq 5.8$–6.6	co-I; 248 h XSHOOTER
2018–2023	NSF — HERA: Unveiling the Cosmic Dawn	co-I; US$7,173,107
2017–2018	PRACE Tier-0 — Galaxy Formation For the Epoch of Reionization (GAFFER)	PI; 30,000,000 core hours
2016–2020	NSF — Illuminating our Early Universe with HERA	co-I; US$9,900,000
2015–2021	ERC StG — An Illumination of the Dark Ages: modeling reionization & interpreting observations	PI; €1,468,750

SUPERVISION

13 PhD students (3 current; 5 graduated with honours) and 10 postdoctoral researchers in total.

- **PhD supervisor (SNS):** Y. Zhang (2023–), N. Triantafyllou (2023–), S. Gagnon-Hartman (2022–), D. Breitman (2021–2025, honours), I. Nikolić (2020–2025, honours), D. Prelogović (2019–2024, honours), H. Kaur (2017–2021), E. Sobacchi (2012–2015, honours; Master's thesis 2011–2012).
- **PhD co-supervisor:** A. Ewall-Wice (MIT, 2011–2017), F. Pacucci (SNS, 2012–2015, honours), J. Schroeder (Columbia, 2007–2014), K. Dixon (UCLA, 2009–2012), D. Crociani (Bologna, 2008–2012).
- **Postdoctoral supervisor (SNS):** J. Flitter (2024–), J. Cang (2024–), S. Murray (Marie Curie Fellow, 2023–2025), J. Davies (2021–2025), B. Nasirudin (2020–2024), Y. Qin (2018–2021), C. Heneka (2018–2019), J. Park (2016–2020), N. Gillet (2016–2019), B. Greig (2013–2017).

TEACHING

Master's and PhD courses at UniCT and SNS since 2011, plus invited lecture series at international schools.

- Professor, Cosmic Structure Formation, UniCT, 42h (2027–).

- Professor, Astrostatistics, UniCT, 42h (2026–).
- Professor, Extragalactic Astronomy and Cosmology, UniCT, 42h (2026).
- Professor, Computational Astrophysics, UniCT, 50h (2025).
- Professor, Astrostatistics, SNS, 20h (2022–2025).
- Professor, Structure Formation in the Early Universe, SNS, 40h (2011–2025).
- Professor, Frontiers of Cosmology, SNS, 40h (2015–2022).
- Invited lecturer, International School on Physics of the Universe – Multi-Messenger Astrophysics, Asiago (2020); Cosmological Applications from First Stars, Reionization and 21-cm Observations, University of Barcelona (2018).
- Instructor, Astronomy Lab 101 (2003–2005); TA, graduate Cosmology (2004), Columbia University.

SELECTED INVITED TALKS / REVIEWS

56 invited talks, reviews and lecture series since 2010, including 21 invited reviews (2 plenary).

- 2026 — IX Global 21-cm Workshop, Valletta (review): "Multi-tracer forward modelling of the first billion years"
- 2026 — Gamow Conference (plenary review): "The 21cm signal from the first billion years"
- 2026 — Tokyo (review): "What we know about early galaxies and reionization from the IGM"
- 2025 — TeVPA 2025, Valencia (plenary review): "The 21cm signal from the Cosmic Dawn"
- 2025 — Port Douglas: "A multi-tracer view of the first billion years: what do JWST observations imply for the cosmic 21cm signal?"
- 2025 — ICTS Bengaluru: "Forward-modeling the first billion years with 21cmFASTv4"
- 2025 — Cosmology with the SKA, IIT Indore (review): "Towards the 21cm revolution"
- 2024 — 21cm Cosmology Workshop, Hangzhou (review): "HI signal forecasts and simulations"
- 2023 — Jeju (review): "Status and future of 21cm cosmology during the first billion years"
- 2023 — Quy Nhon (review): "Cosmic Dawn and Reionization: what we know now and what more can we learn"
- 2022 — CERN (review): "Cosmology with the 21cm line"
- 2021 — RAS meeting (review): "Learning about the first billion years with the HERA telescope"
- 2017 — IAU Symposium 333 (review): "The Cosmic Dawn and Epoch of Reionization: Theory and Simulations"

SELECTED ORGANISING ROLES

Scientific Organising Committee member for 20 international meetings (2012–2027), 12 as chair or co-chair.

- Chair, Understanding the Epoch of Reionization I, II, III, Sesto (2023, 2025, 2027).
- Chair or co-chair, SKA EoR Working Group meetings: Pisa (2017, 2022), Belgrade (2026).
- Chair, Next-Gen. Cosmology with Next-Gen. Radio Telescopes I and II, Sesto (2018, 2020).
- Chair, International 21cmFAST development workshop, Pisa (2019).
- Chair, The Dawn of Galaxies, Obergurgl Research Conference, Austria (2017).
- Co-Chair, HI 21cm Cosmology, Kavli Workshop, UK (2016); Physics of Reionization and the Cosmic Dawn in the SKA Era, Sesto (2016).

INSTITUTIONAL SERVICE

20 institutional roles at UniCT and SNS since 2011; selected:

- Faculty committee member, Physics PhD program, UniCT (2026–).
- Physics commission member for Master's degree International Fellowships, UniCT (2026).
- Faculty committee member, Computational Astrophysics and Cosmology PhD program, SNS (2023–2026).
- Physics faculty representative, SNS University Forum (2023–2025).
- Department of Excellence Steering Committee member, SNS (2023–2025).
- Steering committee member, SNS High-Performance Computing center (2020–2025).
- Postdoctoral fellowship award commissions (2013–2025); thesis defense commissions (2013–).
- Founder and organizer: Cosmology Journal Club (2011–2022); Reionization arXiv discussion group (2017–); Machine Learning arXiv discussion group (2019–).

LANGUAGES

English (native speaker), Serbian (native speaker), Italian (C1)

last updated 22.10.2026