MATILDE SIGNORINI

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ADS publication list · Google Scholar

ACADEMIC APPOINTMENTS

2025 – present **ESA Research Fellow**, ESA/ESTEC, Noordwijk, The Netherlands

2024 – 2025 **Postdoctoral Researcher**, University of Roma Tre, Italy — supervisor: Dr. Federica Ricci

2022 – 2024 **Visiting Graduate Researcher**, UCLA, USA — supervisor: Prof. Tommaso Treu (reverberation mapping, cosmology)

EDUCATION

2024 **Ph.D. in Physics and Astronomy**, University of Florence, Italy
Thesis: "AGN as cosmological probes" — Supervisor: Prof. Guido Risaliti

2020 **M.Sc. in Physical and Astrophysical Sciences**, University of Florence — 110/110 with honours
Thesis: "Towards a precise determination of cosmic distances with quasars" — Supervisor: Prof. G. Risaliti

2018 **B.Sc. in Physics and Astrophysics**, University of Florence — 110/110 with honours
Thesis: "The relationship between luminosities and spectral properties in quasars" — Supervisor: Prof. G. Risaliti

FELLOWSHIPS, AWARDS & GRANTS

2024 **ESA Research Fellowship** — 3-year fellowship at ESTEC (~€200k)

2024 **Simons Foundation Grant** — Aspen Center for Physics Summer Program (~$4,000)

2024 **Honourable Mention**, Premio Tacchini XIX (SAIt) for the Ph.D. thesis "AGN as cosmological probes"

2022 **Sara Lapi Award 2021**, best Master's thesis in scientific subjects, University of Florence

2021 **Honourable Mention**, Premio Magini 2020 (Arcetri Observatory, INAF), Master's thesis in astrophysics

PUBLICATIONS

42 papers in peer-reviewed journals; >1000 citations, h-index 16. Full list: NASA ADS.

First author works:

Fooled by mass? Disentangling disc–corona coupling in AGN through X-ray variability, submitted to A&A, arXiv:2609.37607 (2026) https://arxiv.org/abs/2609.37607

BASS LV. Connecting X-ray variability with AGN physical properties and a new path to cosmological distances, A&A, 710, A9 (2026) https://doi.org/10.1051/0004-6361/202558009

Precision near-IR spectroscopy for understanding AGN physics and shed light on the H0 tension, New Astronomy, 128, 102592 (2026) https://doi.org/10.1016/j.newast.2026.102592

Quasars as standard candles V. Accounting for the dispersion in the LX-LUV relation down to ≤ 0.06 dex, A&A, 687, A32 (2024)) https://doi.org/10.1051/0004-6361/202348941

Quasars as standard candles IV. Analysis of the X-ray and UV indicators of the disc-corona relation, A&A, 676, A143 (2023), https://doi.org/10.1051/0004-6361/202346104

X-ray properties and obscured fraction of AGN in the J1030 Chandra field, A&A, 676, A49 (2023), https://doi.org/10.1051/0004-6361/202346364

INVITED TALKS & SEMINARS

2026 *"The LX–LUV relation in quasars: a new sample"* — AGN XVI, Brindisi, Italy

"Connecting X-ray variability with AGN physical properties and a new path to cosmological distances" — SEAWIND conference, Palermo, Italy

2025 *"Quasars as standard(izable) candles"* — LUPM seminar, Montpellier, France

"X-ray variability in low-redshift AGN" — SRON seminar, Leiden, The Netherlands

"STORM2: variability in the multi-year monitoring of Mrk 817" — Vasto Accretion Meeting, Italy

	"Study of possible systematics in the use of quasars as standard candles" — Cosmoverse workshop, Naples, Italy
	"AGN as cosmological probes" — ESO lunch talk, Garching, Germany
2024	*"Distance measurements with Active Galactic Nuclei"* — INAF Rome Observatory, Italy
2023	*"Reverberation mapping: high-z SMBH masses, BLR physics and H_0"* — UNLV, Las Vegas, USA
	"The Mass of a Supermassive Black Hole More Than 10 Billion Light-years Away" — Calpoly, San Luis Obispo, CA, USA
	"Quasars as cosmological tools" — UC Riverside, CA, USA
	"Non-parametric analysis of the Hubble Diagram with Neural Networks" — Machine Learning the GGI Workshop, Florence, Italy

CONTRIBUTED TALKS

2026	*"The photon-index–Eddington-ratio relation in AGN"* — The X-ray Universe 2026, Elche, Spain
	"X-ray and optical AGN variability as a probe of SMBH physics and cosmology" — COSPAR 2026, Florence, Italy
	"The Photon index-Eddington ratio relation in AGN" — COSPAR 2026, Florence, Italy
2024	*"BASS AGN as standard-candle anchors: luminosity–variability correlations"* — BASS 2024, Baltimore, USA
	"The Luminosity-variability relation in BASS type-1 AGN, its connection with physical properties and cosmological implementations" — AGN XVI, Padova, Italy
	"Distance measurements with Active Galactic Nuclei" — Cosmoverse, Kraków, Poland
	"Precision near-IR spectroscopy for understanding AGN physics and shed light on the H0 tension" — Unveiling the Universe with SHARP: a Spectrograph Proposal for MORFEO@ELT, Milano, Italy
2023	*"Building the high-redshift Hubble Diagram with quasars"* — Cosmoverse, Lisbon, Portugal
	"X-ray properties and obscured fraction of AGN in the J1030 Chandra field" — X-ray Universe 2023, Athens, Greece
2022	*"A tight(er) Lx-Luv relation: most suitable proxies and causes of dispersion"* — AGN XV, Florence, Italy
	"Cosmic evolution of AGN obscuration in the J1030 field" — COSPAR22, Athens, Greece
	"Testing cosmological models with quasars at high redshift" — COSPAR22, Athens, Greece
	"Quasars for the high-redshift Hubble Diagram" — HACK100, Trieste, Italy
2021	*"Quasar as standard candles"* — Arcetri Observatory (INAF), Florence, Italy

POSTERS

2026	*"Does the corona know what the accretion disc is doing… and does it even care?"* — SSW #18, La Granja de San Ildefonso, Spain
2024	*"Recent findings about the LX–LUV relation in quasars and the physics behind it"* — XXXIII IAU General Assembly, Cape Town, South Africa
2023	*"Reverberation mapping of a z=2.8 lensed quasar"* — EAS 2023, Kraków, Poland
	"Non-parametric analysis of the Hubble Diagram with Neural Networks" — EAS 2023, Krakow, Poland
2022	*"Latest observational results about the disc-Corona interplay in quasars"* — EAS 2022, Valencia, Spain
	"Towards a precise and reliable determination of cosmic distances with quasars" — EAS 2022, Valencia, Spain

OBSERVING EXPERIENCE

Accepted proposals: 20 (2 as PI)

- "A MUSE+ERIS filler programme to study supermassive black hole growth and feedback", ESO MUSE+ERIS, 163h, **co-I** (PI: D. Kakkad)
- "Hunting the little monsters in the backyard: LBT spectroscopy of LRD candidates in the local Universe", LBT, 22.5hr, **co-I** (PI: F. Ziparo)
- "The optical properties of X-ray weak quasars: expanding the LUCI spectroscopic investigation of the QUBEX sample", LBT, 9.2hr, **PI: Matilde Signorini**
- "Quasar physics and cosmology at z~4", XMM-Newton, ~1.1 Ms, **co-I** (PI E. Nardini)
- "The rifts in the mountains: Connecting high- and low-redshift AGN through Balmer absorption", LBT-MODS/LUCI, 9hr, **co-I** (PI B. Trefoloni)

- "Follow-up observations of the QUBEX sample: testing the BLR evolution of X-ray weak quasars", LBT-MODS, 2.5hr, **co-I** (PI B. Trefoloni),
- "Infrared Spectroscopic Reverberation Mapping of GRAVITY/VLTI-targeted AGN Mrk1239", IRTF, **co-I** (PI V. Bennert), program 2026A009
- "Infrared Spectroscopic Reverberation Mapping of GRAVITY/VLTI-targeted AGNs Mrk509 and Mrk1239", IRTF, **co-I** (PI V. Bennert), program 2025B037
- *"Follow-up observations of the QUBEX sample: testing the BLR evolution of X-ray weak quasars",* LBT-MODS, 2.5hr, co-I (PI B. Trefoloni)
- "IGR J163184848: COMPTON-THICK REFLECTION INSIDE OUR GALAXY" XRISM G02 (**co-I**, PI B. Vander Meulen)
- "*Investigating the Normalized Excess Variance in low black hole mass AGN*", XMM-Newton, (**co-I**, PI: A. Peca)
- "*Heavily Obscured AGN - testing the radio selection technique*", ESO VLT/FORS2, 25hr (**co-I**, PI: G. Mazzolari)
- "*Unveil the Compton-thick AGN population using radio emission",* LBT/MODS, 20hr (**co-I**, PI: G. Mazzolari)
- "*LUCI spectroscopic investigation of the first QUBEX sample of X-ray weak quasars",* LBT-LUCI, 20 hr, (**PI: Matilde Signorini**)
- "*Infrared Spectroscopic Reverberation Mapping of two GRAVITY/VLTI-targeted AGNs",* IRTF, **co-I** (PI V. Bennert), program 2025A033
- "*Near-Infrared Reverberation Mapping of GRAVITY/VLTI AGN Ark120*", Gemini, (**co-I**, PI V. Bennert), program GS-2024B-Q-231
- Poor Weather proposal: "*Near-Infrared Reverberation Mapping of GRAVITY/VLTI AGN Ark120",* Gemini, (**co-I**, PI V. Bennert)
- "*Infrared Spectroscopic Reverberation Mapping of a GRAVITY/VLTI-targeted Active Galactic Nucleus*", 2024B028, IRTF- SpecX (**co-I**, PI: V. Bennert)
- "*Infrared Spectroscopic Reverberation Mapping of a GRAVITY/VLTI-targeted Active Galactic Nucleus*", 2024A044, IRTF- SpecX (**co-I**, PI: V. Bennert)
- "*Outside the halo: Tracking the Mpc-scale structure of a z~1.7 protocluster with SoFI*", ESO-SoFi, (**co-I**, PI: S. Marchesi), 6hr, code ESO P111 Proposal 112.25ZV

Observing nights: IRTF/SpecX (~40 nights, 2022–2025); Keck 1/OSIRIS-LGS (2 nights, 2022).

TECHNICAL SKILLS

Languages: Python (extensive), IDL, C, Fortran. · OS: MacOS, Linux.
UV spectra: QSFit, custom Python routines. · **X-ray:** CIAO/Sherpa, XSPEC, SPEX.
IR reduction: Spextool, PypeIt, pyspextool, Sipgi.

TEACHING & SUPERVISION

2026	**B. Miklošová** — LEAPS internship (10-week programme, Leiden Univ. / ESA-ESTEC), "Study of X-ray weak AGN"
	D. Poli — M.Sc. thesis, "Cosmology with AGN optical variability", Roma Tre (co-supervised, F. Ricci, F. La Franca)
	C. Cherubini — M.Sc. thesis (LEMPP), "Unveiling X-ray emission in AGN: accretion physics and galaxy evolution"
	S. O'Donnell, J. Young — Cal Poly SLO undergraduates, "IRTF reverberation mapping of Mrk 1239" (co-supervised, V. Bennert)
2024	**PhD course lecturer**, "AGN as cosmological probes", University of Roma Tre
2021	**L. Vannini** — B.Sc. thesis, "Correction to the quasar luminosity function for inclination effects"

ACADEMIC & COMMUNITY ENGAGEMENT

2027	**LSOC**, "Super-Eddington Accretion onto Supermassive Black Holes" workshop, Sexten, Italy
2027	**LSOC**, NewAthena SWG2 Meeting, ESTEC, The Netherlands
2026	**LOC**, "Primordial Galaxy Star Formation with JWST & ELT", ESTEC ·
	LOC, The X-ray Universe 2026 ·
	LSOC, SSW #18 ·
2026 –	**Representative** of the ESA Research Fellows ·
	Editor, "Mission Performance" section, NewAthena Red Book ·
2025 –	**Member**, Young ESA Environmental Committee ·
	Reviewer, ESA Research Fellowship program ·
	Reviewer, ESA Archival Research Visitor Programme

2023 –	**Referee** for: Astronomy&Astrophysics, ApJ, MNRAS, Physics Letters B, Physics of the Dark Universe, Qeios
2021 – 2024	**PhD students' representative**, Physics Dept., University of Florence · **Founder**, canteen-sustainability committee (with MenoPerPiù NGO)

OUTREACH & SCIENCE COMMUNICATION

2025	**Public talk**, "Galassie e Materia Oscura: un Universo in Tensione", Cosmoverse@Naples · **Volunteer** at ESA Open Day
2024	**Article**, "Studiare l'espansione dell'Universo attraverso i nuclei galattici attivi", Giornale di Astronomia https://www.torrossa.com/it/resources/an/5882094
2024	**Translator and Editor**, Italian version of the CosmoVerse teaching materials on cosmology and cosmological tensions for high school students https://cosmoversetensions.eu/for-the-public/teaching-the-universe/

SCHOOLS & FORMATIVE EXPERIENCES

2025	*Masterclass: The ESA Science Programme* — ESTEC
2024	*Accretion Physics in the JWST Era* — Aspen Center for Physics, USA
	XRISM workshop — University of Geneva, Geneva, Switzerland
2023	*4th Italian Astrostatistics School* — INAF Brera, Milan
2021	*Fundamental cosmology from ELT and space* — 4th Azores School on Observational Cosmology, Hangra do Heroismo, Portugal
	Theoretical Aspects of Astroparticle Physics, Cosmology and Gravitation — Galileo Galilei Institute, Florence, Italy

LANGUAGES

Italian (native) · **English** (fluent) · **Dutch** (beginner)