

PERSONAL INFORMATION

Luigi Foschini




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Nationality Italian

WORKING EXPERIENCE

(Note: over the years, following various reorganizations of public research bodies and universities, the names of the institutes where I worked have changed several times. For simplicity, I report only the current name of the institute)

- 2024–today Senior Researcher, *Brera Astronomical Observatory*, National Institute of Astrophysics (INAF), Milano/Merate, Italy
- 2009–2023 Researcher, *Brera Astronomical Observatory*, National Institute of Astrophysics (INAF), Milano/Merate, Italy
- 2008–2009 Researcher, *Observatory of Astrophysics and Space Science (OAS)*, National Institute of Astrophysics (INAF), Bologna, Italy
- 2002–2003 Detached as IBIS/PICsIT Instrument Specialist at the *INTEGRAL Science Data Centre (ISDC) for Astrophysics*, Versoix (Geneva), Switzerland
- 2002–2008 Fixed-term Researcher, *Observatory of Astrophysics and Space Science (OAS)*, National Institute of Astrophysics (INAF), Bologna, Italy
- 2000–2002 Post-doc, *Observatory of Astrophysics and Space Science (OAS)*, National Institute of Astrophysics (INAF), Bologna, Italy
- 1997–1999 CNR Fellow, *Institute of Atmospheric and Climate Sciences*, National Research Council (CNR), Bologna, Italy
- 1993–1997 Freelance engineer and collaboration with *Institute of Atmospheric and Climate Sciences*, National Research Council (CNR), Bologna, Italy
- 1990–1991 Military Service (Italian Army)

EDUCATION AND QUALIFICATIONS

- 1990 Doctoral Laurea in Electric Engineering, University of Bologna, Italy
- 1990 Qualification to practice the profession of engineer
- 1994 Ph.D. in Electric Engineering, Universities of Bologna and Ancona (associated), Italy; final examination at the Minister of University and Scientific Research, Roma
- 1997 Doctoral Laurea in Physics, University of Bologna, Italy
- 2013 Qualification as Associate Professor of Astronomy, Astrophysics, Physics of the Earth and the Planets

RESEARCH EXPERIENCE AND ACTIVITIES

- Publications and impact
- Author or coauthor of >480 essays (books, scientific and technical papers, refereed or not, and popular science). About 56% of them as first, only, or corresponding author. Full text available on [Research Gate](#).
 - Citations: *Google Scholar*: >12000; h-index = 58; *ADS*: >9000; h-index = 50;
 - 34 talks at international scientific conferences (5 invited), tens of seminars held in universities and research institutes, in Italy and abroad.

- Commissions of trust**
- Regular referee for international scientific journals (e.g. *Nature*, *A&A*, *ApJ*, *AJ*, *MNRAS*, *Universe*, *Frontiers in Astronomy and Space Science*, *Cambridge University Press*,...).
 - Reviewer for the Italian Minister of University and Scientific Research, Czech Academy of Sciences, Israel Science Foundation, Polish National Science Centre, Swiss National Foundation.
 - Chair and membership in Time Allocation Committees (*INTEGRAL*; *XMM-Newton*; *Fermi*; *Swift*).
 - Chair and membership in Scientific Organizing Committees of national and international scientific conferences.
 - Member Editorial Board of the international scientific journal *Universe*, Section Compact Objects (2020-2024).
- Research projects**
- 2017-2019: *e-ASTROGAM*, PI A. De Angelis (INFN, Padova), member.
 - 2015-2018: *X-ray Imaging Polarimetry Explorer (XIPE)*, PI P. Soffitta (IAPS/INAF, Roma). Co-chairman (with P. Kaaret, U. Iowa, USA) of the Quantum Gravity Working Group.
 - 2009-2011: *PI of three multiwavelength campaigns*, see: [Abdo et al. \(Fermi LAT Coll., L. Foschini corresponding author\) 2009, ApJ 707, 727](#); [Foschini et al., 2011, MNRAS 413, 1671](#); [Foschini et al., 2012, A&A 548, A106](#).
 - 2006-2009: *International Astronomical Consortium for High-Energy Calibration*, member.
 - 2005-2009: *Simbol-X*, PI P. Ferrando (Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA), Saclay, France), member.
 - 2005-2009: *Fermi Large Area Telescope (LAT)*, PI P. Michelson (Stanford University, USA). Affiliated Scientist (2005-2008), Full Member (2009).
 - 2000-2009: *INTEGRAL/IBIS/PICsIT*, PI G. Di Cocco (OAS/INAF, Bologna). PICsIT Instrument Specific Software developer (2000-2002), and responsible (2002-2009).
 - 1999-2019: *Tunguska99 Scientific Expedition*, PI G. Longo (University of Bologna), member.
 - 1997-1999: *Mesoscale Alpine Programme (MAP)*, PI A. Buzzi (ISAC/CNR, Bologna), member.
- Grants**
- PI of basic research grants from INAF (~ 15 k€) and contributions for conferences organization from INAF, IAU, and JAXA (~ 6 k€);
 - Col of some research grants on data analysis of high-energy astrophysics satellites from INAF, ASI, and MIUR.
 - Visiting scientist (funded visits):
 - March 1999, *Astronomical Institute of the Czech Academy of Sciences*, Ondřejov (Czech Republic);
 - May 2000, *Air Force Research Laboratory, Hanscom Air Force Base*, Hanscom (MA, USA);
 - July 2012 and June 2016, *Institut für Theoretische Physik und Astrophysik, Universität Würzburg* (Germany);
 - May 2019, *Aalto University, Metsähovi Radio Observatory*, Finnish Centre for Astronomy with ESO (Finland);
 - May 2024 *European Southern Observatory (ESO)*, Santiago (Chile).
 - 2000-today: PI or Co-I of tens of accepted observing proposal with *INTEGRAL*, *XMM-Newton*, *Swift*, *Chandra*, *NuStar*, *Suzaku*, *RXTE*, *BeppoSAX*, *ESO (VLT e NTT)*, *GTC*, *LBT*, *e-VLBI*, *JVLA*, *Keck*, *APEX*.
- Teaching**
- Some courses on relativistic astrophysics at universities and summer schools.
 - Supervisor of some graduating/phd students, and postdocs.
 - Public outreach and education: seminars in schools and for the public, books, papers, and video.
- Professional Societies**
- International Astronomical Union (IAU),
 - International Society for Quantum Gravity.
- Mother tongue** Italian

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	C2	B2	C1	C2
Français	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](#)

RESEARCH INTERESTS

Summary My research activity is now mainly divided into two topics: **active galactic nuclei** (~ 70% of the time), with particular reference to relativistic jets, and **fundamental physics** (~ 30% of the time), with particular reference to the physics of time.

As regards the **first topic**, my research is focused on the study of jetted AGN with relatively small masses of the central black hole, whose presence is in tension with the paradigm of the unified model of Urry & Padovani (1995) and the so-called *blazar sequence* by Fossati et al. (1998) and Ghisellini et al. (1998). My most significant works are on the discovery of high-energy gamma-ray emission (MeV-GeV) from Narrow-Line Seyfert 1 galaxies (Abdo et al. 2009a, 2009b, 2009c, Foschini et al. 2015; for a recent review on the topic Foschini 2020), and the consequent unification of relativistic jets from AGN with those from Galactic compact objects (Foschini 2014, 2017, 2022). Now I am trying to expand [the sample of objects](#) and improve the estimate of the crucial physical quantities ([power of the jet](#), luminosity of the accretion disk, mass of the central black hole) to confirm the indications that emerged from the early works.

The **second topic** is inspired by the observation that time is almost neglected in physics, generating many more problems than one might think. Therefore, I am trying to propose an effective physics of time, based on the interpretation of time as a cut, which fits well with the foliation of a 3+1 spacetime (Foschini 2018, 2019). The obvious implications of these studies concern [cosmology](#), black holes, and quantum gravity. This topic fascinated me since the nineties, being hinged on the main question of modern physics: what are the fundamental laws that regulate the Universe? I am also searching for observational constraints to quantum gravity theories.

I think that **my strengths** are a broad, interdisciplinary, and pragmatic culture (see, for example Foschini 2015), the result of a heterogeneous course of studies, initially dictated by my youthful uncertainties. The impossibility of a homogeneous and more traditional course of studies led me to make oblique choices, because they were dictated by contingency, often taking what others discarded. On the other hand, this non-linear path allowed me to gain experience in different topics, forming the basis of a solid interdisciplinary culture. The most negative aspect was the impossibility of building lasting relationships with colleagues.

Selected Publications

1. L. Foschini et al.: [The Power of Relativistic Jets: A Comparative Study](#), *Universe*, **10**, (2024), 156.
2. L. Foschini et al.: [A New Sample of Gamma-Ray Emitting Jetted Active Galactic Nuclei](#), *Universe*, **8**, (2022), 587.
3. L. Foschini: [Jetted Narrow-Line Seyfert 1 Galaxies & Co.: Where Do We Stand?](#), *Universe*, **6**, (2020), 136.
4. L. Foschini et al.: [Mapping the narrow-line Seyfert 1 galaxy 1H 0323+342](#), *Universe*, **5**, (2019), 199.
5. L. Foschini: [The cut of time](#), *The Time Machine Factory 2019* (Torino, Italy, 23-25 September 2019).
6. L. Foschini: [Fisica del Tempo](#) (Bonomo, Bologna, 2018).
7. L. Foschini: [What we talk about when we talk about blazars?](#), *Frontiers in Astronomy and Space Science*, **4**, (2017), 6.
8. L. Foschini et al.: [Properties of flat-spectrum radio-loud narrow-line Seyfert 1 galaxies](#), *Astronomy and Astrophysics*, **575** (2015) A13.
9. L. Foschini: [The Blandford-Znajek theory revisited](#), *XXVIII Texas Symposium on Relativistic Astrophysics* (Geneva, Switzerland, Dec 13-18, 2015).
10. L. Foschini: [The Unification of Relativistic Jets](#), *International Journal of Modern Physics Conference Series*, **28** (2014) id. 1460188.
11. L. Foschini et al.: [Fermi/LAT detection of extraordinary variability in the gamma-ray emission of the blazar PKS 1510-089](#), *Astronomy and Astrophysics*, **555** (2013) id. A138.
12. L. Foschini et al.: [Short time scale variability at gamma rays in FSRQs and implications on the current models](#), *III Fermi Symposium* (Roma, Italy, May 9-12, 2011).
13. Fermi LAT Collaboration (L. Foschini corresponding author): [Radio-Loud Narrow-Line Seyfert 1 as a New Class of Gamma-Ray Active Galactic Nuclei](#), *The Astrophysical Journal*, **707** (2009) L142.
14. Fermi LAT Collaboration (L. Foschini corresponding author): [Fermi/Large Area Telescope Discovery of Gamma-Ray Emission from a Relativistic Jet in the Narrow-Line Quasar PMN J0948+0022](#), *The Astrophysical Journal*, **699** (2009) 976.
15. L. Foschini et al.: [A short hard X-ray flare from the blazar NRAO 530 observed by INTEGRAL](#), *Astronomy and Astrophysics*, **450** (2006) 77.