europass Curriculum vitae

PERSONAL INFORMATION

Francesco Ubertosi

44, Via Libia, 40138, Bologna, Italy

+39 3311067504

francesco.ubertosi2@unibo.it

https://www.unibo.it/sitoweb/francesco.ubertosi2/en

https://sites.google.com/view/francescoubertosi/

Date of birth 28 January 1996 | Nationality Italian

WORK EXPERIENCE

November 2023 – Present — Postdoctoral Researcher

Institution: Department of Physics and Astronomy – University of Bologna

Project: AGN-sCAN: zooming-in on the AGN-galaxy connection since the cosmic noon

EDUCATION AND TRAINING

8 Jan 2024 – 23 Feb 2024 — Visiting fellow

Project Title: "Disrupting the AGN feedback cycle in galaxy groups and clusters"

Institution: Harvard & Smithsonian Center for Astrophysics, Cambridge (MA)

Supervisor: Dr. Ewan O'Sullivan, Dr. Gerrit Schellenberger

31 Oct 2020 – 31 Oct 2023 (Defended April 9, 2024) — PhD in Astrophysics

Thesis Title: "A comprehensive study of the AGN feedback cycle in galaxy clusters from high resolution X-ray and radio observations"

Institution: Department of Physics and Astronomy – University of Bologna, Italy

Supervisor: Prof. Myriam Gitti, Prof. Fabrizio Brighenti

15 Aug 2022 – 15 Dec 2022 — Visiting fellow

Project Title: "Jet reorientation events in the central galaxies of clusters and groups: insights from *Chandra* and VLBA data"

Institution: Harvard & Smithsonian Center for Astrophysics, Cambridge (MA)

Supervisor: Dr. Ewan O'Sullivan, Dr. Gerrit Schellenberger

17 Sep 2018 – 9 Oct 2020 — Master's degree in Astrophysics and Cosmology (LM – 58)

Final grade: Magna cum laude

Institution: Department of Physics and Astronomy – University of Bologna, Italy

Thesis Title: "The first *Chandra* study of Abell 795: a FR0 radio galaxy at the center of a sloshing cluster"

Thesis Supervisor: Prof. Myriam Gitti, Prof. Fabrizio Brighenti, Dr. Eleonora Torresi, Dr. Paola Grandi

21 Sep 2015 – 18 Jul 2018 — Bachelor's degree in Astronomy (L – 30)

Final grade: Magna cum laude

Institution: Department of Physics and Astronomy – University of Bologna, Italy

Thesis Title: "Scattering processes in Astrophysics - the quasar PKS 0637-752"

Thesis Supervisor: Prof. Daniele Dallacasa

TEACHING ACTIVITIES

:

Co-supervision of MS students	University of Bologna L. Rosignoli, Thesis title: *Detailed analysis of a deep Chandra observation of the galaxy cluster Abell 2495*, AY 2021/2022 (supervisor: Prof. M. Gitti). I. Fornasiero, Thesis title: *Investigating AGN feedback in Hα-luminous galaxy clusters: the first Chandra X-ray Analysis of Abell 2009*, AY 2023/2024 (supervisor: Prof. M. Gitti). N. Rotella, Thesis title: *A combined JVLA, GMRT and XMM study of Abell 795: a candidate radio phoenix?*, AY 2023/2024 (supervisor: Prof. M. Gitti).

ASSIGNED POSITIONS

Referee activity	MNRAS, Astrophysics and Space Science, MemSAIt, New Astronomy.
Collaborations and Working groups	– Member of the Athena Science Working Group 1.3 “AGN feedback in galaxy clusters and groups” (January 2023 - Current). – Member of the AXIS Science Working Group “Galaxy evolution: feedback in galaxies and clusters” (April 2022 - Current).

ATTENDANCE AT NATIONAL AND INTERNATIONAL MEETINGS

Conferences and Workshops	– 1 - 5 July 2024: Galaxy groups in the era of eROSITA and Euclid, Sesto (BZ, Italy), Contributed Talk. – 6 - 10 May 2024: SPARCS XII: Pushing towards the final frontier, Bologna (BO, Italy), Contributed Talk. – 24 - 29 Sep 2023: A journey through galactic environments, Porto Ercole (GR, Italy), Contributed Talk. – 10 - 15 Sep 2023: AGN on the Beach, Tropea (VV, Italy), Contributed Talk. – 22 - 25 May 2023: High-resolution X-ray spectroscopy school, Alicante (ES). – 16 - 24 Jul 2022: 44th COSPAR Scientific Assembly, Athens (GR), Contributed Talk. – 20 - 24 June 2022: Sexten Center, Multiphase AGN feeding & feedback II, Sesto (BZ, Italy), Invited Talk and Poster. – 23 Nov - 1 Dec 2021: Canary Islands XXXII Winter School of Astrophysics Tenerife (ES), Poster. – 17 - 26 Aug 2021: Chandra Data Workshop, online, Flash Talk. – 14 - 18 Jun 2021: Extragalactic jets on all scales, online, Poster. – 10 - 14 May 2021: 6th Workshop on CSS and GPS radio sources, online, Contributed Talk. – 8 - 11 Mar 2021: A new window on the radio emission from galaxies, clusters and cosmic web, online, Flash Talk.
Seminar Talks	I have shared my scientific results by giving 10 seminar talks at the IRA-INAF, OAS-INAF, University of Bologna, Center for Astrophysics (CfA), and U.S. Naval Research Laboratory research institutes.

COMPETITIVE TELESCOPE TIME ALLOCATIONS AS PI

Facility Chandra

Proposal title	“A pilot study on the onset of AGN feedback in cool cores hosting young central radio galaxies”
Time awarded	200 ks in Cycle 25, see Abstract.

Facility VLBA

Proposal title	“Is the AGN in NGC5044 alive and kicking? A kinematic-polarimetric VLBA study”
Time awarded	14 hours in semester 2024B, see Abstract.
Proposal title	“AGN feeding at the parsec scale: tracking HI absorption in NGC5044 with the VLBA”
Time awarded	19 hours in semester 2024B, see Abstract.
Proposal title	“A JVLA and VLBA study of feedback in a rapidly cooling, yet perturbed cluster”
Time awarded	8 hours in semester 2024B, see Abstract.
Proposal title	“Dramatic misalignment of jets and X-ray cavities in galaxy clusters and groups”

Time awarded 30 hours in semester 2023A, see Abstract.

Facility JVLA
Proposal title "A JVLA and VLBA study of feedback in a rapidly cooling, yet perturbed cluster"
Time awarded 10 hours in semester 2024B, see Abstract.

Proposal title "The JVLA view of a shocked radio mini-halo"
Time awarded 6 hours in semester 2023B, see Abstract.

Proposal title "A quest for feedback from a cluster central FR0 radio galaxy"
Time awarded 7 hours in semester 2023A, see Abstract.

Proposal title "Mini-halo or radio phoenix? The diffuse source in the galaxy cluster Abell 795"
Time awarded 1 hour in semester 2022B, see Abstract.

Proposal title "Are the perpendicular outbursts in RBS 797 hiding a dual AGN? A new JVLA study"
Time awarded 7.2 hours in semester 2022A, see Abstract.

COMPETITIVE TELESCOPE TIME ALLOCATIONS AS CO-I

Facility Chandra
Proposal title "Galaxy clusters with misaligned jets and cavities", PI: G. Schellenberger
Time awarded Archival proposal in Cycle 25.

Facility ALMA
Proposal title "The complex feeding-feedback cycle of Abell 2495: where is the molecular gas?", PI: M. Gitti
Time awarded 9.5 hours in cycle 10.

Facility GMRT
Proposal title "Understanding the impact of AGN feedback in the hot-core group NGC 777", PI: E. O'Sullivan
Time awarded 8 hours in cycle 44.

Facility JVLA
Proposal title "Studying the youngest phase of AGN activity in the galaxy cluster MS 0735.6+7421", PI: N. Biava
Time awarded 9 hours in semester 2024B.

Facility XMM-Newton
Proposal title "Giant Radio Galaxies: Testing the Extremes of AGN Feedback", PI: E. O'Sullivan
Time awarded 187 ks in Cycle AO-22.

AWARDS

Date August 2022
Type of award Recipient of the PhD mobility grant *Marco Polo* (4.0 k€) from the Alma Mater Studiorum Università di Bologna.

Date November 2021
Type of award Best 12 Master's degree thesis in 2019 – 2021 (1.0 k€) at the Department of Physics and Astronomy from the Alma Mater Studiorum Università di Bologna.

REFEREED PUBLICATIONS

[1] **F. Ubertosi**, M. Giroletti, M. Gitti, N. Biava, E. De Rubeis, A. Bonafede, L. Feretti, M. Bondi, L. Bruno, E. Liuzzo, A. Ignesti, and G. Brunetti. "A JVLA, LOFAR, e-Merlin, VLBA and EVN study of RBS 797: can binary SMBHs explain the outburst history of the central radio galaxy?" In: *arXiv e-prints*, arXiv:2405.08079 (May 2024), arXiv:2405.08079. arXiv: 2405.08079 [astro-ph.GA].

[2] **F. Ubertosi**, G. Schellenberger, E. O'Sullivan, J. Vrtilek, S. Giacintucci, L. P. David, W. Forman, M. Gitti, T. Venturi, C. Jones, and F. Brighenti. "Jet Reorientation in Central Galaxies of Clusters and Groups: Insights from VLBA and Chandra Data". In: *The Astrophysical Journal* 961.1, 134 (Jan. 2024), p. 134. arXiv: 2312.02283 [astro-ph.GA].

[3] **F. Ubertosi**, M. Gitti, F. Brighenti, V. Olivares, E. O'Sullivan, and G. Schellenberger. "Waking the monster: The onset of AGN feedback in galaxy clusters hosting young central radio galaxies". In: *Astronomy & Astrophysics* 673, A52 (May 2023), A52. arXiv: 2303.04821 [astro-ph.GA].

[4] **F. Ubertosi**, M. Gitti, F. Brighenti, M. McDonald, P. Nulsen, M. Donahue, G. Brunetti, S. Randall, M. Gaspari, S. Ettori, M. Calzadilla, A. Ignesti, L. Feretti, and E. L. Blanton. "Multiple Shock Fronts in RBS 797: The Chandra Window on Shock Heating in Galaxy Clusters". In: *The Astrophysical Journal* 944.2, 216 (Feb. 2023), p. 216. arXiv: 2212.10581 [astro-ph.GA].

[5] **F. Ubertosi**, M. Gitti, and F. Brighenti. "Chasing ICM cooling and AGN feedback from the macro to the meso scales in the galaxy cluster ZwCl 235". In: *Astronomy & Astrophysics* 670, A23 (Feb. 2023), A23. arXiv: 2211.09141 [astro-ph.GA].

[6] **F. Ubertosi**, M. Gitti, F. Brighenti, G. Brunetti, M. McDonald, P. Nulsen, B. McNamara, S. Randall, W. Forman, M. Donahue, A. Ignesti, M. Gaspari, S. Ettori, L. Feretti, E. L. Blanton, C. Jones, and M. Calzadilla. "The Deepest Chandra View of RBS 797: Evidence for Two Pairs of Equidistant X-ray Cavities". In: *The Astrophysical Journal Letters* 923.2, L25 (Dec. 2021), p. L25. arXiv: 2111.03679 [astro-ph.GA].

[7] **F. Ubertosi**, M. Gitti, E. Torresi, F. Brighenti, and P. Grandi. "A Chandra study of Abell 795 - a sloshing cluster with an FR0 radio galaxy at its centre". In: *Monthly Notices of the Royal Astronomical Society* 503.3 (May 2021), pp. 4627–4645. arXiv: 2103.08682 [astro-ph.GA].

[8] E. O'Sullivan, K. Rajpurohit, G. Schellenberger, J. Vrtilek, L. P. David, A. Babul, V. Olivares, **F. Ubertosi**, K. Kolokythas, I. Babyk, and I. Loubser. "A hot core in the group-dominant elliptical galaxy NGC 777". In: *arXiv e-prints*, arXiv:2405.13667 (May 2024), arXiv:2405.13667. arXiv: 2405.13667 [astro-ph.GA].

[9] L. Rosignoli, **F. Ubertosi**, M. Gitti, F. Brighenti, T. Pasini, E. O'Sullivan, F. Gastaldello, M. Gaspari, and P. Temi. "Deep Chandra Observations of A2495: A Possible Sloshing-regulated Feedback Cycle in a Triple-offset Galaxy Cluster". In: *The Astrophysical Journal* 963.1, 8 (Mar. 2024), p. 8. arXiv: 2312.12855 [astro-ph.GA].

[10] A. Bonafede, M. Gitti, N. La Bella, N. Biava, **F. Ubertosi**, G. Brunetti, G. Lusetti, M. Brienza, C. J. Riseley, C. Stuardi, A. Botteon, A. Ignesti, H. Röttgering, and R. J. van Weeren. "Shock imprints on the radio mini halo in RBS 797". In: *Astronomy & Astrophysics* 680, A5 (Dec. 2023), A5. arXiv: 2310.07773 [astro-ph.CO].

[11] M. S. Calzadilla, M. McDonald, M. Donahue, B. R. McNamara, K. Fogarty, M. Gaspari, M. Gitti, H. R. Russell, G. R. Tremblay, G. M. Voit, and **F. Ubertosi**. "Testing the Limits of AGN Feedback and the Onset of Thermal Instability in the Most Rapidly Star-forming Brightest Cluster Galaxies". In: *The Astrophysical Journal* 940.2, 140 (Dec. 2022), p. 140. arXiv: 2207.01624 [astro-ph.GA].

CONFERENCE PROCEEDINGS

F. Ubertosi, M. Gitti, E. Torresi, F. Brighenti, and P. Grandi. "The central FR0 in the sloshing cluster Abell 795: Indications of mechanical feedback from Chandra data". In: *Astronomische Nachrichten* 342.1207 (Nov. 2021), pp. 1207–1211. arXiv: 2111.02160 [astro-ph.GA].

PERSONAL SKILLS

Computer skills

- Reduction and analysis of astronomical data from the following international observing facilities (primarily X-ray and radio, secondarily optical): *Chandra*, JVLA, EVN, and VLBA data (proficient knowledge), LOFAR, e-Merlin, GMRT (advanced knowledge), *XMM-Newton*, VLT-MUSE and ALMA (basic/intermediate knowledge).
- Programming skills: Python (advanced), Fortran90 (basic/intermediate).

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2

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

Social and Communication skills

- Team work: during my PhD I have worked in several national and international teams, practicing and mastering effective communication and active listening. I improved my relational and social skills by interacting with people involved in the PhD project (mainly from Italian, European, and US research institutes). During the four-months fellowship at the Center for Astrophysics (Cambridge, MA) I developed the capability to work with people from different countries and research areas.
- Mediating skills: As a co-supervisor of three Master's degree students, I have managed the interaction between the students and the main advisor, developing the empathy, patience, and problem-solving skills that are necessary when teaching and supervising students. During the PhD at the University of Bologna and the visiting fellowship at the Center for Astrophysics I have developed the sense of balance between taking the lead of research projects and being open to constructive feedback from collaborators.
- Outreach skills: during my PhD I attended a public outreach school (Designing innovative public engagement activities), where I learned how to communicate science to the general public. I participated in designing, producing, and testing a multi-sensory (seeing, hearing, and touching) outreach activity that was presented at the Astronomy Festival "The Universe in all senses". During this project I improved my ability to stimulate scientific awareness in the general public.

Organisational / managerial skills

In pursuing my research projects, I developed original projects from conception to execution. This required to translate ideas into working plans, identify suitable collaborators based on their experience, and manage time effectively. The skills that I have developed and mastered during my PhD enable me to effectively manage multiple deadlines and parallel projects, as evidenced by my 7 first-author refereed publications, 10 accepted observing proposals as PI, and 10 conference that I have attended over the past three years. As co-supervisor of three Master's degree students, I helped developing the aims and timelines for the thesis projects, ensuring that the projects were in line with the academic interests of the students. I provided regular feedback and guidance to help the students step by step.

Driving licence B