

CRISTIAN VIGNALI

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Observational astrophysicist. Interests include physics and evolution of Active Galactic Nuclei (AGN), galaxy evolution, high-redshift Universe, dual AGN, X-ray winds.

PERSONAL DATA

- Place and date of birth: Rimini, January 16th, 1972.
 - Nationality: Italian.
 - Address: Via B. Lanzarini, 10 – 40127 Bologna
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EDUCATION

Bologna University — PhD in Astronomy, February 2001 (thesis on *The High-Energy Large Area Survey: probing the multiwavelength properties of the sources making the hard X-ray background*); supervisors: Prof. G.G. Palumbo, Dr. A. Comastri.

Bologna University — Laurea Degree in Astronomy, July 1996 (110/110 *cum laude*); thesis *On the X-ray absorption in Active Galactic Nuclei*; supervisors: Prof. G.G. Palumbo, Dr. A. Comastri.

APPOINTMENTS

Dipartimento di Fisica e Astronomia, Università degli Studi di Bologna

Associate Researcher since September 2014

Researcher, January 2005 – September 2014

Dipartimento di Astronomia, Università di Bologna

Post-doctoral fellow, June 2004–January 2005

Osservatorio Astronomico di Bologna

Post-doctoral fellow, April 2003–May 2004

Dept. of Astronomy & Astrophysics, The Pennsylvania State University

Post-doctoral scholar, April 2001–March 2003

Osservatorio Astronomico di Bologna

Post-doctoral fellow, December 2000–March 2001

PROFESSIONAL ACTIVITIES

PARTICIPATION IN FUTURE MISSIONS

- Member of the “High-redshift Universe” panel for the NASA mission *Constellation-X* (which became *IXO* together with the ESA mission *XEUS*, then *Athena+* and, finally, *Athena*, approved).
- Among the co-Is of the *XEUS* proposal for the ESA Cosmic Vision (future missions). The proposal was successful.
- Among the co-Is of the *Athena+* proposal for the ESA Cosmic Vision (future missions). The proposal was successful.
- Active member of the science working groups on “Formation and early growth of black holes” and “Accretion through cosmic time” in the *Athena* collaboration.
- Member of the *Euclid* Science work package WP9 (“Type 1 and 2 AGN”).
- Member of the *Lynx* WG on large-scale structure and High-redshift Universe.
- Member of the *SPICA* collaboration (passed to the first selection of ESA M5).

SOC/LOC

- Member of the SOC and LOC for the “X-ray Astronomy 2009. Present status, multi-wavelength approach and future perspectives” (Bologna, September 2009).
- Member of the LOC for the 9th AGN conference “Black Hole and Revelation” (Ferrara, May 2010).
- Member of the LOC for the Workshop “Whereabouts, Physical State and Metallicity of the Missing Baryons in the Local Universe” (Cervia, May 2012).
- Co-organizer of “The high-redshift Universe” Workshop (Bologna, June 2012).
- Member of the SOC for the XXL 2014 consortium meeting (Sexten, June 2014).
- Member of the LOC for the *NuSTAR* meeting 2015 (Bologna, March 2015).
- Member of the SOC for the XXL 2015 consortium meeting (Mljet, June 2015).
- Member of the SOC for the XXL 2016 consortium meeting (Mykonos, June 2016).
- Member of the SOC for the international conference “Hot spots in the XMM sky: cosmology from X-ray to radio” (Mykonos, June 2016).
- Member of the SOC for the EWASS 2016 SS05 “A multi-messenger view of mergers and multiple supermassive black holes” (Athens, July 2016).
- Member of the SOC for the XXL 2017 consortium meeting (St-Jakut, October 2017).
- Co-organizer of the Workshop at the Lorenz Center “The Quest for Multiple Supermassive Black Holes: A Multi-Messenger View” (Leiden, November 2017).
- Member of the SOC for the EWASS 2019 SS7 “Dual Nuclei in Late Stage Galaxy Mergers and their Effect on Galaxy Evolution” (Lyon, June 2019).
- Member of the LOC for “Views on the Interstellar Medium in galaxies in the ALMA era” (Bologna, September 2019).
- Member of the SOC for “X-ray Astronomy 2019. Current Challenges and New Frontiers in the Next Decade” (Bologna, September 2019).

AS A REFEREE

- Regular referee for some of the major astronomical journals (ApJ, ApJ Lett., AJ,

MNRAS, A&A, New Astronomy, EXPA).

- Referee for XMM-Newton and Chandra proposals.
- Referee for FIRB (MIUR) proposals.
- Referee for the Flanders Research Foundation (FWO) post-doctoral fellowships.
- Referee for the Rita Levi Montalcini fellowships.

ORGANIZER OF SEMINAR/LESSONS

- Co-organizer of official “Thursday” seminars at the Observatory/Astronomy Department (2009–2016).
- (Co-)organizer of internal cycles of seminars for PhD students:
 - ◊ “Physical properties of AGN”, 2010;
 - ◊ “Missing baryons”, 2011;
 - ◊ “Accretion onto compact objects and its role in shaping galaxies”, 2013;
 - ◊ “The high-redshift Universe, and the role of galaxies and AGN to cosmic reionization”, 2015;
 - ◊ “A multi-wavelength view of the Galactic Center, 2017”.
- Member of the LOC for the PhD School of Astrophysics “Francesco Lucchin” held in Bertinoro, 18–23 Sept., 2016 (topics: *The Hot and Energetic Universe through high-resolution spectroscopy; Techniques and strategies to search for signs of Life in the Solar System: new results from Rosetta*).

ACADEMIC SUPERVISION ROLE

- Supervisor/co-supervisor of many Master and some PhD theses at the University of Bologna (some of “my” former and current students are listed below).
- Member of the *Collegio dei docenti* for PhD students in Astronomy.
- Member of the committee for the final evaluation of PhD students in Milano/Bicocca (three times).
- External referee for PhD thesis for the Rome Tre University (three times).
- External referee for PhD thesis for the University of Florence (once).
- External referee for PhD thesis for Roma Tor Vergata University (twice).
- Member of the committee for the PhD in Physics at Ferrara (2017).
- Member of the committee for a RTD-A position at Roma Tre University.
- Member of the committee for the final evaluation of PhD students in Florence (2019).
- Member of the committee for the evaluation of the Erasmus student program.

OTHER RELEVANT INFORMATION

- High-rank scientific evaluation (fascia A) for many years since 2007 by Osservatorio della Ricerca.
 - ASN (National Scientific Evaluation, 2013): (G1: publications/G2: research activity/G3: scientific responsibility): excellent/excellent/very good.
 - Italian AGN deputy of the XMM-XXL Survey (international collaboration).
 - Co-chair of the XXL AGN WG.
 - Member of the XXL-HSC joint working group.
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MAIN INTERNATIONAL COLLABORATIONS

Member of the *Chandra*-COSMOS Legacy collaboration; *Chandra*/XMM-COSMOS collaborations; *Chandra*/XMM Deep Field South collaboration; *Chandra* Deep Field North collaboration; XXL collaboration (member of the steering committee, Italian deputy for AGN science, co-chair of the AGN working group, and member of the XXL-HSC joint working group); SUPER collaboration (PI: V. Mainieri, ESO); *Athena* collaboration; *Euclid* collaboration; *Lynx* (NASA concept study) collaboration; *SPICA* collaboration.

DIRECT OBSERVING EXPERIENCE

- Two optical photometric and spectroscopic observing runs at ESO 3.6m Telescope at La Silla (Chile). Results were published in few papers and partly in my PhD thesis.
 - Two optical photometric observing runs at 1.5m Telescope at S. Pedro Martir (Mexico). Results were published mostly in my PhD thesis.
 - Three photometric and spectroscopic (optical/near-IR) observing runs at the 3.5m Italian National Telescope (TNG) at La Palma (Canary Islands). Results were published in few articles.
 - Observing run in the sub-millimeter band ($850\mu\text{m}$) with *SCUBA* in Hawaii (observing time granted after application to international time). Results were published in a paper.
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PROPOSAL EXPERIENCE

PI and co-I of many accepted proposals at optical (4m- and 8m-telescope classes), infrared, sub-mm, and X-ray wavelengths (for the X-ray band: *ASCA*, *BeppoSAX*, *Chandra*, *XMM-Newton*, *Suzaku*, *Swift* and *NuSTAR*).

In particular, some of the most important, multi-cycle accepted projects in the X-ray survey field are listed below:

- CDF-S project: 7 Ms *Chandra* (PI: Prof. W. Niel Brandt);
- CDF-S project: 3 Ms *XMM-Newton* (PI: Dr. A. Comastri).
- CDF-N project: 2 Ms *Chandra* (PI: Prof. W. Niel Brandt);
- COSMOS project: 1.8 Ms *Chandra* (PI: Prof. M. Elvis);
- COSMOS-Legacy project: 2.8 Ms *Chandra* (PI: Dr.ssa F. Civano);
- SERVS XMM-LSS: 1.28 Ms *XMM-Newton* (PI: Prof. W. Niel Brandt).
- SDSS J1030+0524 field ($z=6.3$ quasar): 500 ks *Chandra* (PI: Dr. R. Gilli).
- SUBWAYS: Supermassive Black holes Winds in the X-rays: VLP with *XMM-Newton* (Cycle 18; PI: M. Brusa).

Furthermore, here is a list of most relevant X-ray accepted proposals in the last two cycles (2016–2017) of *Chandra*, *XMM-Newton*, and *NuSTAR* where I was either PI or co-I with direct involvement in the proposal:

Chandra Cycle 18

- A quadruple AGN system at $z=2$ (PI: Prof. C. Vignali): 140 ks.

Chandra Cycle 19

- Heavily reddened, luminous Type 1 quasars (PI: Dr. E. Piconcelli): 144 ks.

- Outflows in the most luminous quasars (PI: Dr. L. Zappacosta): 90 ks.
- The first quasars in the Universe (PI: Prof. W.N. Brandt): 429 ks.
- X-ray monitoring of $z > 4$ radio-quiet quasars (PI: Prof. O. Shemmer): 90 ks (over three cycles).
- Building a complete sample of $z > 1$ XXL galaxy clusters (PI: Dr. B. Maughan): 152 ks.

XMM-Newton Cycle 15

- Binary BHs (PI: Dr.ssa A. De Rosa): 180 ks.
- SERVS XMM-LSS (PI: Prof. W.N. Brandt): 1.28 Ms.
- X-ray outflows in lensed quasars (PI: Dr. M. Dadina): 83 ks.
- High-redshift AGN outflows (PI: Dr. M. Brusa): 30 ks.

XMM-Newton Cycle 16

- W1W2-dropout quasars (PI: Dr. E. Piconcelli): 108 ks.
- Searching for outflows in quasars at $z=2$ (PI: Dr. M. Cappi): 444 ks.
- Cosmology with quasars (PI: Prof. G. Risaliti): 1.045 Ms.
- Feedback in hyper-luminous quasars (PI: Dr. L. Zappacosta): 134 ks.
- X-ray weakness of BALQSOs (PI: Dr. F. Vito): 131 ks.
- AGN pairs in galaxy mergers (PI: Dr.ssa N. Loiseau): 110 ks.

NuSTAR Cycle 2

- The origin of the reflection-dominated spectrum of ESO 138–G1 (PI: Dr. E. Piconcelli): 50 ks.
- NGC 2785, a heavily Compton-thick AGN in the backyard (PI: Prof. C. Vignali): 70 ks.

NuSTAR Cycle 3

- The high-energy cut-off in high-redshift quasars (PI: Dr. G. Lanzuisi): 250 ks.

RESEARCH GRANTS

- ASI grant “Studi di Astrofisica delle Alte Energie e di Fisica Astroparticellare”. Bando Analisi Dati, Teoria e Simulazioni (Accordo Attuativo ASI-INAF n. 2017-14-H.0). *Supermassive Black Hole Winds in X-rays*
- ASI grant “Studi di Astrofisica delle Alte Energie e di Fisica Astroparticellare”. Bando Analisi Dati, Teoria e Simulazioni (Accordo Attuativo ASI-INAF n. 2017-14-H.0). *Looking for Super Massive Black Hole Binary systems*
- Finanziamento ASI per partecipazione italiana allo studio di fase A della missione *SPICA* in selezione M5.
- ASI-NARO18 (*NuSTAR*): *Constraining the disk-corona and nuclear absorption properties in AGN with NuSTAR.*
- ASI grant “Studi di Astrofisica delle Alte Energie e di Fisica Astroparticellare”, Bando “Future Missioni” *STAR-X: the next generation of X-ray imaging surveys*
- ASI grant “Studi di Astrofisica delle Alte Energie e di Fisica Astroparticellare. Bando 2017”. Bando Analisi Dati, Teoria e Simulazioni. *Probing AGN feedback in the most luminous QSOs at cosmic noon ($z \sim 2 - 3$)*

- ASI grant “Studi di Astrofisica delle Alte Energie e di Fisica Astroparticellare. Bando 2017”: *Quasars at High-Redshift: Physics and Cosmology*
- Bando SKA-CTA 2016: *Probing particle acceleration and γ ray propagation with CTA and its precursors*
- Bando SKA-CTA 2016: *FORMATION and Evolution of Cosmic STRUCTURES (FORE-CaST) with Future Radio Surveys*
- ASI-NARO16 (*NuSTAR*): *An unprecedented look at AGN by NuSTAR broad-band X-ray spectroscopy*
- ASI-NARO15 (*NuSTAR*): *Fire under ice: the central engine of the most luminous, dust-obscured AGN*
- PRIN INAF 2014: *Windy black holes probing galaxy evolution*
- ASI: *Probing the X-ray absorber structure in Mrk 915 through fast spectral variability*
- NASA grant of 35,000 USD for Cycle 15 *Chandra* accepted proposal as PI (used to finance my US collaborators).
- FARB 2012 (studi di fattibilità): *Osservazioni radio Bologna-Tokyo per lo studio dei buchi neri supermassicci nei nuclei delle galassie attive* (participant).
- PRIN 2010-11: *The dark Universe and the cosmic evolution of baryons: from current surveys to Euclid* (participant).
- PRIN-INAF 2011: *Black hole growth and AGN feedback through cosmic time* (participant).
- ASI: *IXO in the Cosmic Vision - supporto scientifico all’assessment study* (participant).
- ASI-INAF I/009/10/0: *Physics and morphology of Active Galactic Nuclei* (unit coordinator).
- ASI-INAF I/088/06/0: *Accretion processes in nearby and distant radio-quiet AGNs and QSOs* (unit coordinator).
- ASI-INAF I/23/05/0: *Accretion and ejection in AGNs* (unit coordinator).
- ASI-INAF COFIS: *Analisi dati nel contesto dello studio di cosmologia di strutture formate* (participant).
- PRIN 2006: *L’evoluzione cosmologia, le proprietà fisiche e la demografia dei buchi neri supermassicci* (participant).
- PRIN 2003: *La storia dell’accrescimento nell’Universo studiata nella banda X* (participant).
- NASA financial support of $\approx 70,000$ USD and $\approx 36,000$ USD for two *Chandra* approved projects during my period in US as fellow.
- PRIN 2000: *Oscureamento e riprocessamento nella storia cosmica dei nuclei galattici attivi* (participant).

DATA REDUCTION AND ANALYSIS. GENERIC SKILLS

- Large experience in X-ray data reduction and analysis, and interpretation of data obtained from the main telescopes of the last 15–20 years (e.g., *ROSAT*, *ASCA*, *Bep-poSAX*, *Suzaku*, *Chandra*, *XMM-Newton*, *Swift*, *NuSTAR*) using some of the main

software packages (XSPEC, FTOOLS, XSELECT, XIMAGE, XRONOS, CIAO, SHERPA, SAS, MIDAS).

- Experience in optical photometric and spectroscopic data reduction and analysis using IRAF and MIDAS.
 - Some experience in sub-mm data reduction and analysis using SURF.
 - Some experience with photometric redshift packages (e.g., HYPERZ) and tools for survival and partial correlation analysis.
 - Large experience in programming (FORTRAN language); some basic knowledge of IDL and TCL/TK.
 - Large experience in managing catalogs and astronomical databases.
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PRESENTATIONS AND CONFERENCE POSTERS

Presentations include more about 40 talks (eight of which invited). Attended conferences without any contribution are also included.

- II Italian National Meeting on AGNs (Riccione, Italy, 1996) – Posters (4).
- AAS High Energy Astrophysics Division Meeting (Estes Park, USA, 1997) – Poster.
- III Italian National Meeting on AGNs (Roma, Italy, 1998) – Oral contribution.
- III INTEGRAL Workshop “The Extreme Universe” (Taormina, Italy, 1998).
- XIX Texas Symposium on Relativistic Astrophysics (Paris, France, 1998).
- Workshop “X-ray surveys and the history of accretion in the Universe” (Roma, Italy, 1999).
- Symposium “X-ray Astronomy 1999: Stellar Endpoints, AGN, and the X-ray Background” (Bologna, Italy, 1999) – Poster.
- Workshop “Large scale structure in the X-ray Universe” (Santorini, Greece, 1999) – Oral contribution.
- IV Italian National Meeting on AGNs (Trieste, Italy, 2000) – Oral + poster contribution.
- Workshop “Two Years of Science with *Chandra*” (Washington, USA, 2001) – Poster.
- V Italian National Meeting on AGNs (Como, Italy, 2002) – Oral + poster contribution.
- International Workshop on “X-ray Surveys, in the light of the new observatories” (Santander, Spain, 2002) – Poster.
- Symposium on “The restless high-energy Universe” (Amsterdam, The Netherlands, 2003) – Poster.
- Tenth Marcel Grossmann Meeting (Rio-de-Janeiro, Brazil, 2003) – Oral contribution.
- Symposium on “AGN Physics with the SDSS” (Princeton, USA, 2003) – Oral contribution.
- Conference on “Multiwavelength AGN Surveys” (Cozumel, Mexico, 2003) – Oral contribution.
- VI Italian National Meeting on AGNs (Volterra, Italy, 2004) – Oral contribution.
- Conference on “Growing black holes” (Garching, Germany, 2004) – Poster.
- COSPAR Meeting (Paris, France, 2004) – Two oral contributions.
- Conference on “Superunification of Active Galactic Nuclei: Black Hole Mass, Spin and Accretion Rate (Elba Island, Italy, 2005) – Oral contribution.

- Conference on “Galaxies and Structures through Cosmic Times” (Venice, Italy, 2006) – Poster.
- VII Italian National Meeting on AGNs (Montagnana, Italy, 2006) – Oral contribution.
- International Astronomy Meeting “The multicolored landscape of compact objects and their explosive progenitors” (Cefalù, Italy, 2006) – Oral contribution.
- Conference on “At the Edge of the Universe. Latest results from the deepest astronomical surveys” (Sintra, Portugal, 2006) – Oral contribution.
- Conference on “The central engine of Active Galactic Nuclei” (Xi’an, China, 2006) – Poster.
- A *Chandra* Science Workshop “Extragalactic surveys” (Cambridge – Boston, US, 2006) – Oral contribution.
- Conference “The extreme Universe in the *Suzaku* era” (Kyoto, Japan, 2006).
- Conference “XEUS: Visions of the Extreme Universe” (London, UK, 2007).
- Workshop “CNO2” (Chiemsee, Germany, 2007) – Invited oral contribution.
- Conference “Obscured AGN across Cosmic Time” (Seeon, Germany, 2007) – Two short oral contributions.
- Workshop “La scienza di *Herschel*” (Rome, Italy, 2008).
- Workshop “ An XXL extragalactic survey: prospects for the XMM-*Newton* next decade” (Paris, France, 2008).
- Conference “The X-ray Universe 2008” (Granada, Spain, 2008) – Poster.
- COSPAR Meeting (Montreal, Canada, 2008) – Oral contribution.
- Workshop “Exploring the Hot Universe with *IXO*” (Garching, Germany, 2008).
- Workshop on “Multi-wavelength Astronomy & Virtual Observatory” (Madrid, Spain, 2008) – Invited oral contribution.
- Symposium “*Simbol-X*: focusing on the hard X-ray Universe” (Paris, France, 2008) – Oral contribution.
- Meeting on “*Safari Science*” (Saclay, France, 2009).
- Conference on “Accretion and ejection in AGN: a global view” (Como, Italy, 2009).
- Conference on “The energetic cosmos: from *Suzaku* to *ASTRO-H*” (Otaru, Japan, 2009).
- Workshop on “Wide Field X-ray Telescope” (Sexten, Italy, 2009) – Oral contribution.
- Conference “X-ray Astronomy 2009. Present status, multi-wavelength approach and future perspectives” (Bologna, Italy, 2009).
- IX Italian National Meeting on AGNs “Black Holes and Revelations” (Ferrara, Italy, 2010) – Concluding remarks.
- Workshop “Infrared/X-ray Connection in Galaxy Evolution” (MSSL, UK, 2010) – Oral contribution.
- Workshop “What drives the Growth of Black Holes?” (Durham, UK, 2010) – Oral contribution.
- Conference “Accretion and Outflow in Black Hole Systems” (Kathmandu, Nepal, 2010) – Invited oral contribution.
- Conference “*IXO* Science Meeting: Present status and future prospects in X-ray astronomy” (Roma, Italy, 2011).

- Workshop “Bridging electromagnetic astrophysics and cosmology with gravitational waves” (Milano, Italy, 2011) – Invited oral contribution.
- Conference “From dust to galaxies” (Parigi, France, 2011) – Oral contribution.
- Conference “New Horizons for High Redshifts” (Cambridge, UK, 2011) – Poster.
- Conference “The starburst-AGN connection under the multiwavelength limelight” (Madrid, Spain, 2011) – Oral contribution.
- X Italian National Meeting on AGNs “Dall’orizzonte degli eventi all’orizzonte cosmologico” (Roma, Italy, 2012).
- Conference “Half a century of X-ray Astronomy” (Mykonos, Greece, 2012) – Oral contribution.
- Conference “X-ray Astronomy: towards next 50 years!” (Milano, Italy, 2012).
- Conference “A Panchromatic View of Galaxy Evolution 30 years after IRAS” (Paphos, Cyprus, 2013) – Oral contribution.
- ENIGMA (Exploring the Nature of the Inter- and Circum-galactic Media) Workshop (Heidelberg, Germany, 2013) – Invited Oral contribution.
- IAU Symposium 304: “Multiwavelength AGN Surveys and Studies” (Yerevan, Armenia, 2013) – Invited review contribution.
- First EU-FP7 FISICA Workshop: Science Goals of sub-arcsecond Far-Infrared Space Observatory (Rome, Italy, 2014).
- XXL-AGN Meeting (Athens, Greece, 2014) – Oral contribution.
- High Energy Processes around Compact Objects (Florence, Italy, 2014) – Oral contribution.
- The X-ray Universe 2014 (Dublin, Ireland, 2014) – Oral contribution and poster.
- XXL Meeting (Sexten, Italy, 2014) – Oral contribution.
- The first billion years of galaxies and black holes (Sexten, Italy, 2014).
- AGN versus star formation: the fate of the gas in galaxies (Durham, UK, 2014). – Poster.
- XI Italian National Meeting on AGN “Where Black Holes and Galaxies Meet” (Trieste, Italy, 2014). – Invited review contribution.
- ISSI Meeting on “Unveiling multiple AGN activity in galaxy mergers” (Bern, Switzerland, 2014). – Oral contribution.
- *NuSTAR* Science Team Meeting (Bologna, 2015).
- XXL Meeting (Mljet, Croatia, 2015) – Oral contribution.
- Demography and environment of AGN from multi-wavelength surveys (Chania, Crete, 2015). – Oral contribution.
- XXL Cosmology workshop (Florence, 2016). – Oral contribution.
- Italian *SPICA* Workshop 2016 (Rome, 2016) – Oral contribution.
- XXL Meeting (Mykonos, Greece, 2016) - Oral contribution.
- Hot spots in the XMM sky: Cosmology from X-ray to Radio (Mykonos, Greece, 2016). – Oral contribution.
- Illuminating the Dark Ages: Quasars and galaxies in the Reionization Epoch (Heidelberg, Germany, 2016) - poster.

- EWASS Symposium (Athens, Greece, 2016). – Oral contribution + Short oral contribution.
- The X-ray Universe 2017 Meeting (Rome, Italy, 2017). – Oral contribution + poster.
- XXL Meeting (St Jacut, France, 2017) - Oral contribution.
- Meeting on “Multiphase AGN feeding and feedback. Linking the micro to macro scales in galaxies, groups, and clusters” (Sesto, Italy, 2018) - Invited oral contribution.
- XXL-AGN Meeting (Durham, UK, 2018) - Oral contribution.
- Meeting on ”X-ray Surveys of the Hot and Energetic Universe” (Harbin, China, 2019) – Oral contribution.
- Meeting on ”Supermassive Black Holes: Environment and Evolution” (Corfú, Greece, 2019) – Oral contribution.
- EWASS Symposium (Lyon, France, 2019). – Two oral contributions.
- ASTROBLACK Workshop (Milan, 2019). – Invited oral contribution.

SEMINARS

- Osservatorio Astronomico di Brera (2006): *What are the X-ray observations of optically selected Type 2 quasars telling us?*
- Osservatorio Astronomico di Merate (2009): *The quest for luminous, obscured quasars through X-ray, infrared, and optical observations.*
- Gent University (2011): *Obscured quasars.*
- Osservatorio Astronomico di Roma (2014): *Obscured accretion and star formation at $z \approx 1$.*
- Institut Astrophysique de Paris (2015): *The search for heavily obscured AGN*
- INAF – IAPS (Roma, 2018): *The realm of the first AGN in the Universe*
- University of Barcelona (Barcelona, October 2019): *The (endless) quest for obscured AGN*

PUBLIC OUTREACH

- Specola seminar (May 2011): *L’Universo violento visto ai raggi X.*
- Seminar at the Physics and Astronomy Department (March 2016): *Evidenze astrofisiche di corpi collassati: Pulsar e Buchi Neri.*

TEACHING/ASSISTANCE TO LAB ACTIVITIES

Esperimentazioni di Fisica II

Assistance in lab. — AA2004-05 till AA2009-10

Laboratorio di Astrofisica (modulo di laboratorio in banda X)

Assistance in lab. + lessons — AA2005-06 – AA2015-16 (excluding AA2008-09)

Laboratorio di Astrofisica

Lessons + assistance in lab. AA2016-17, AA2017-18, AA2018-19, AA2019-20

Elementi di Informatica – Elementi di Programmazione I

Assistance in lab. – AA2006-07 + AA2008-09

Elementi di Programmazione III

Assistance in lab. — AA2007-08

Calcolo per l’Astronomia

Assistance in lab. – AA2009-10

Astrofisica delle Alte Energie

Teaching course — AA2009-10 – Present (excluding AA2010-11)

Esperimentazioni di Fisica I

Assistance in lab. — AA2011-12

Fisica per Biologia

Assistance in lab. — AA2014-15, AA2015-16, AA2016-17, AA2017-18, AA2018-19

Attività professionalizzante

Evaluation of reports prepared by students on scientific seminars, schools, workshops, and meetings – 2011–2015

Winter school on X-ray data analysis at Fudan University (Shanghai, China

Two weeks of lessons and X-ray data reduction, analysis and interpretation of AGN – January 2018

STUDENT SUPERVISION

During my research activity, I have been supervisor/co-supervisor of many under-graduate and graduate students. In the following I present a list of some of my students (in alphabetical order).

- Roberto Angioni: former, IMPRS PhD in Bonn, now postdoc in Rome.
- Maria Angela Campisi: former IMPRS PhD in Munich, now working in London.
- Chiara Circosta: former under-graduate student in Bologna, then IMPRS PhD student in Munich, currently postdoc at UCL (London).
- Agnese Del Moro: now post-doc at MPE (Garching), former fellow at Durham University (UK).
- Ivan Delvecchio: former post-doc in Zagreb, then Marie Curie fellow in Saclay, currently with a permanent position at INAF-OA Brera.
- Margherita Giustini: former ESA Fellow in Madrid, then in SRON (Utrecht, The Netherlands), currently as three-yr postdoc in MADrid.
- Giorgio Lanzuisi: now permanent staff at INAF-OAS.
- Elisabeta Lusso: former post-doc at the Durham University, currently RTD-A at the University of Florence.
- Filippo Marcello Maccagni: former PhD student in Leiden, now at the INAF–Osservatorio Astronomico of Cagliari.

- Stefano Marchesi: former PhD student in Bologna/Yale University, then postdoc in Bologna and at Clemson University (US), currently postdoc at INAF-OAS Bologna.
 - Chiara Mongardi: PhD student at INAF-Osservatorio Astronomico of Trieste.
 - Laura Morselli: IMPRS PhD student in Munich.
 - Riccardo Nanni: former PhD in Bologna, now postdoc at University of California Santa Barbara.
 - Alessandro Nastasi: former IMPRS PhD in Munich, now working in Munich.
 - Fabio Vito: former PhD student and post-doc fellow in Bologna, then at The Pennsylvania State University, now postdoc fellow in Chile.
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INSTITUTIONAL ACTIVITIES

- Member of the committee for the *Laurea (triennale) in Astronomia* for about 10 years.
 - Since 2017, member of the committee for the *Laurea magistrale in Astrofisica e Cosmologia*.
 - Member of the *Collegio dei Docenti* for the PhD in Astrophysics.
 - Member of the *Giunta* of the Physics and Astronomy Department.
 - Member of the School of Science at the University of Bologna.
 - Member of the committee for the definition of the regulations for the newly born Physics and Astronomy Department at the University of Bologna in 2012.
 - Member of the committee for the evaluation of new book acquisition for the library of the Physics and Astronomy Department.
 - Member of the committee for the evaluation of the admissions of students to the *Laurea Magistrale* in Astrophysics and Cosmology.
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RESEARCH AREAS (IN A NUTSHELL)

- X-ray spectral studies and characterization of local Active Galactic Nuclei (e.g., Seyfert galaxies and quasars), and investigation of their multi-wavelength properties.
- Multi-wavelength studies on the nature of the sources contributing to the X-ray background and selected from X-ray surveys.
- Study of the X-ray properties of high-redshift ($z > 3$) AGN (both radio-quiet and radio-loud), and evolution of their properties across cosmic time. Evolution of the α_{ox} spectral index at $z=0.2-6.3$.
- Search for obscured AGN through X-rays, mid-IR and optical diagnostics.
- Type 1 and Type 2 AGN: bolometric luminosity, Eddington ratio and black hole mass estimates.
- Spectral energy distributions of AGN: accretion vs. star formation.
- Mid- and far-IR emission of AGN; properties of the obscuring medium (torus).
- Study of the X-ray properties of the variety of the extremely red object (ERO) population in deep fields and estimate of the fraction of AGN.
- Study of the X-ray properties and number density of optically selected Type 2 quasar candidates from the SDSS and zCOSMOS surveys.

- The dust content in high-redshift quasars.
 - Broad- and narrow-absorption line quasars (BALQSOs, NALQSOs) as test cases for outflowing winds.
 - X-ray outflowing winds.
 - Dual and multiple AGN systems at low and high-redshift.
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