

Lorenzo Lovisari

Postdoc at the
Center for Astrophysics | Harvard & Smithsonian
60 Garden Street, Cambridge, MA 02138, USA
☎+1-617-496-1985; ✉: lorenzo.lovisari@cfa.harvard.edu
<https://www.cfa.harvard.edu/~llovisar/>
ORCID ID: 0000-0002-3754-2415

Research Area

Scaling properties and chemical enrichment of galaxy groups and clusters

Professional Experience

- **Oct 2015 - today:** Postdoctoral position at the Center for Astrophysics | Harvard & Smithsonian in Cambridge, USA
 - **Feb 2011 - Sept 2015:** Postdoctoral position at the Argelander-Institut für Astronomie in Bonn, Germany
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Education

- **Jul 2007 - Dec 2010:** Ph.D student in Physics at the University of Innsbruck, Austria.
Topic: “*Metal Distribution in Galaxy Clusters*”
Supervisor: Prof. Sabine Schindler
 - **July 2006:** Degree in Astronomy at the University of Bologna, Italy.
Title of dissertation (transl.): “*Scaling laws in X-ray band for a sample of Galaxy Clusters at high redshift*”
Supervisors: Prof. Lauro Moscardini, Dr. Stefano Etori
 - **Oct 2000 - July 2006:** Studies of Astronomy at the University of Bologna, Italy.
 - **July 2000:** High School Diploma at the Istituto Tecnico Commerciale “G.B.Conti” - Lendinara (RO).
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Professional Activity

Service:

- XMM-Newton Observing Time Allocation Committee member (2 AOs)
- Member of the Steering Committee of the XMM Heritage program “Witnessing the culmination of structure formation in the Universe” [2017-present]
- RELICS (Reionization Lensing Cluster Survey) collaboration member [2016 - present]
- Member of the American Astronomical Society [2016-present]
- eeHIFLUGCS collaboration member [2014-present]
- Member of the Athena consortium [2014-present]
- Member of the “Clusters and Cosmology” working group of eROSITA [2012-2017]
- CHEERS (CHEmical Enrichment RGS Sample) collaboration member [2013-2015]
- Young Scientist of an international collaboration working on GCs at ISSI (Bern, CH) [2011-2012]
- Chambliss judge at the 233th AAS meeting, Seattle, WA, U.S.A.

Teaching Experience

- Lecture of the “*Practical X-ray astronomy Course*” at the University of Bonn, 2017
 - Lecturer for the Max Planck IMPRS blackboard lectures for graduate students on astronomical detectors and observational techniques, 2014
 - Advisor for four PhD students (2011-2015: Bharadwaj Vijaysarathy; 2012-2016: Katharina Borm and Gerrit Schellenberger; 2014-2017: Sophia Thölken)
 - Advisor for three Master students (2011-2012: Katharina Borm and Gerrit Schellenberger; 2013-2014: Sophia Thölken)
 - Advisor for two Bachelor students (2012: Jens Eler; 2015: Florian Käfer)
 - Teaching assistant for the “Concepts of Physics for Astrophysicists” course in the AstroMundus programme: WS 2010/2011
 - Course of “Exercises of Practical Astronomy” at the University of Innsbruck, Austria: SS 2008/2009, SS 2009/2010
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TIME ALLOCATED for Observing Programs

XMM-Newton

- AO18 (**PI**, 283 ks C time): Observations of a complete sample of galaxy clusters SZ selected
- AO18 (co-I, 113 ks B time): Study of superluminous Spirals as Brightest Cluster Galaxies
- AO18 (co-I, 94 ks C time): Search for echoes of powerful outbursts in the BCG 3C196.1
- AO18 (co-I, 56 ks C time): XMM+HST observations of an extremely massive cluster at $z>0.7$
- AO17 (**PI**, 13 ks C time): observations of a galaxy group
- AO17 (co-I, 3 Ms B time): Heritage Program
- AO17 (co-I, 28 ks B time): Observations of two Ultra-Steep Spectrum Radio Relics
- AO17 (co-I, 169 ks C time): Observations of ten X-ray under-luminous clusters
- AO17 (co-I, 97 ks C time): Search for echoes of powerful outbursts in the BCG 3C196.1
- AO17 (co-I, 68 ks C time): Probing the Growth of Black Holes in galaxy groups and clusters
- AO17 (co-I, 56 ks C time): Observations of an extremely massive galaxy cluster at $z>0.7$
- AO17 (co-I, 26 ks C time): Tracing a filament in the outskirts of the Shapley Supercluster
- AO16 (**PI**, 182 ks B+C time): re-observations of the outskirts of 4 galaxy groups
- AO16 (**PI**, 179 ks C time): Observations of 14 galaxy groups to complete an X-ray selected sample of small mass systems
- AO16 (co-I, 107 ks B+C time): Search for massive star forming spirals as BCG
- AO15 (**PI**, 202 ks C time): Observations of the outskirts of 4 galaxy groups
- AO15 (co-I, 129 ks B time): Observation of the Frontier Fields Cluster A370
- AO14 (co-I, 777ks C time): Large Project to complete an X-ray selected sample of ~ 400 clusters
- AO13 (**PI**, 188 ks C time): Observations of 17 galaxy groups
- AO13 (co-I, 28 ks B time): Short observation of A2244 to support the existing Suzaku data
- AO8 (co-I, 66 ks B time): Observation of the merging cluster A2319

Suzaku

- AO10 (**PI**, 171 ks A time): Observations of 7 groups (not observed because the mission has ended)
- AO9 (**PI**, 200 ks B time): Observations of the outskirt of A3570 (not observed because mission ended)
- AO9 (**PI**, 223 ks B+C time): Observations of 18 galaxy groups
- AO8 (**PI**, 180 ks A+B time): Tracing a filament in the outskirts of the Shapley Supercluster
- AO8 (**PI**, 120 ks A time): Tracking down the Planck supercluster PLCK G214.6-37.0
- AO8 (co-I, 150 ks C time): Observations of the galaxy group A2877 (not observed)
- AO7 (**PI**, 90 ks C time): Observations of the most luminous local galaxy group (not observed)

Chandra

- Cycle 19 (co-I, 15 ks): Direct observation of accretion onto a Hypernova’s newly formed black hole
- Cycle 15 (**PI**, 40 ks): Snapshots of the outer regions of UGC03957

- Cycle 14 (co-I, 131 ks): Completing the observations for an X-ray selected galaxy cluster sample

GMRT

- 2018B (PI, 10h): Observations of two disturbed galaxy groups

SOAR

- 2016B (co-I, 8h): Observations of two early-type galaxies and associated X-ray tails
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Awards, Fellowships, Grants

- NASA Astrophysics Data Analysis Program (ADAP) grant (2019-2021: **\$542.8K**); to fund a postdoc position for 3 years and a PhD student for 1,5 years to analyze archival XMM data.
 - Visiting Scholar fellowship at the University of Bonn (2017: **1.2 kEUR**); funding to cover travel and accommodation expenses to teach the “Practical X-ray astronomy Course” at the University of Bonn
 - NASA grant 80NSSCK0582 (2017: **\$71.6K**) to fund a postdoc for 9 months for the analysis of AO16 XMM data
 - DFG (German Research Foundation) grant LO 2009/1-1 (2013: **80.0 kEUR**) to fund a postdoc for 1 year for the analysis of Suzaku data
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Peer Review

- Referee for Nature (2013)
 - Referee for A&A (2019)
 - Referee for MNRAS (2013-present)
 - Referee for Space Science Reviews (2012)
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Visits at other Institutes

- July 2016: One-week visit at the CEA-Saclay, Paris, France
- June 2016: Three-days visit at the Osservatorio Astronomico di Bologna, Italy (Talk)
- May 2016: One-week visit at the Argelander-Institut für Astronomie, Bonn, Germany (Talk)
- June 2014: Two-days visit at the Netherlands Institute for Space Research, Utrecht, Netherlands
- Sept 2013: Two-days visit at the Netherlands Institute for Space Research, Utrecht, Netherlands (Talk)
- Feb 2013: Two-weeks visit at the Departamento de Astronomia, Sao Paulo, Brazil (Talk)
- Apr 2010: One-week visit at the Observatoire de la Côte d’Azur, Nice, France (Talk)

Conference Participation

- Jan 2019: *233th American Astronomical Society*, Seattle, WA, USA, (Talk)
- Sept 2018: *Cluster2: A view from Italy on galaxy clusters in the 21 century*, Naples, Italy, (Talk)
- May 2018: *Classification in the golden era of X-ray catalogs*, CfA (Invited Talk)
- June 2017: *The X-ray Universe 2017*, Rome, Italy, (Talk)
- Jan 2017: *229th American Astronomical Society*, Grapevine, TX, USA, (Talk)
- May 2016: *XMM-Newton: The Next Decade*, Madrid, Spain, (Talk)
- June 2015: *Let’s group. The life cycle of galaxies in their favorite environment*, Garching bei Muenchen, Germany (Talk)
- June 2014: *The X-ray Universe 2014*, Dublin, Ireland (Poster)
- May 2012: *Vulcano Workshop: Frontier Objects in Astrophysics and Particle Physics*, Vulcano, Italy (Invited Talk)
- May 2012: *XMM-Newton Workshop: Galaxy Clusters as Giant Cosmic Laboratories*, Madrid, Spain (Talk)

- Oct 2011: *First eROSITA International Conference: Mapping the Structure of the Energetic Universe*, Garmisch, Germany (Poster)
 - June 2011: *The X-ray Universe 2011*, Berlin, Germany (Poster)
 - Aug 2010: *Hiking conference*, Stubai Alpen, Austria (Talk)
 - Apr 2010: *7th IBWS : INTEGRAL/BART Workshop*, Karlovy Vary, Czech Republic (Talk)
 - Mar 2010: *High-Resolution X-Ray Spectroscopy: Past, Present, and Future*, Utrecht, The Netherlands (Poster)
 - Dec 2008: *Second International SIMBOL-X Symposium*, Paris, France (Poster)
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Refereed Publications

1. *Detection of a Star Forming Galaxy in the Center of a Low-Mass Galaxy Cluster*, 2018, accepted for publication in ApJ
Bogdán Á.; **Lovisari L.**; Kovacs O. E.; Andrade-Santos F.; Jones C., and 3 coauthors
2. *The Non-Uniformity of Galaxy Cluster Metallicity Profiles*, 2018, accepted for publication in MNRAS
Lovisari L.; Reiprich T. H.
3. *Stormy Weather in 3C 196.1: Nuclear Outbursts and Merger Events Shape the Environment of the Hybrid Radio Galaxy 3C 196.1*, 2018, ApJ, 867, 35
Ricci F.; **Lovisari L.**; Kraft R. P.; Massaro F.; Paggi A.; and 6 coauthors
4. *RELICS: A Strong Lens Model for SPT-CLJ0615-5746, a $z=0.972$ Cluster*, 2018, ApJ, 863, 154
Paterno-Mahler R.; Sharon K.; Coe D.; Mahler G.; Cerny C.; and 28 coauthors (including **Lovisari L.**)
5. *RELICS: Strong Lensing Analysis of the Galaxy Clusters Abell S295, Abell 697, MACS J0025.4-1222, and MACS J0159.8-0849*, 2018, ApJ, 863, 145
Cibirka N.; Acebron A.; Zitrin A.; Coe D.; Agulli I.; and 35 coauthors (including **Lovisari L.**)
6. *RELICS: Strong Lens Models for Five Galaxy Clusters from the Reionization Lensing Cluster Survey*, 2018, ApJ, 859, 159
Cerny C.; Sharon K.; Andrade-Santos F.; Avila R. J.; Bradac M.; and 29 coauthors (including **Lovisari L.**)
7. *RELICS: Strong-lensing Analysis of the Massive Clusters MACS J0308.9+2645 and PLCK G171.9-40.7*, 2018, ApJ, 858, 42
Acebron A.; Cibirka N.; Zitrin A.; Coe D.; Agulli I.; and 35 coauthors (including **Lovisari L.**)
8. *XMM-Newton X-ray and HST weak gravitational lensing study of the extremely X-ray luminous galaxy cluster Cl J120958.9+495352 ($z = 0.902$)*, 2018, A&A, 610, 71
Thölken S.; Schrabback T.; Reiprich T. H.; **Lovisari L.**; Allen S. W.; and 4 coauthors
9. *Correlation between the Total Gravitating Mass of Groups and Clusters and the Supermassive Black Hole Mass of Brightest Galaxies*, 2018, ApJ, 852, 131
Bogdán Á.; **Lovisari L.**; Volonteri M.; Dubois Y.
10. *CHEERS: The chemical evolution RGS sample*, 2017, A&A, 607, 98
de Plaa J.; Kaastra J.; Werner N.; Pinto C.; Kosec P.; and 15 coauthors (including **Lovisari L.**)
11. *X-ray morphological analysis of the Planck ESZ clusters*, 2017, ApJ, 846, 51
Lovisari L.; Forman W.; Jones, C.; Andrade-Santos F.; Etori S.; and 5 coauthors

12. *iPTF15eqv: Multiwavelength Exposé of a Peculiar Calcium-rich Transient*, 2017, ApJ, 846, 50
Milisavljevic D.; Patnaude D. J.; Raymond J. C.; Drout M. R.; Margutti R.; and 13 coauthors
(including **Lovisari L.**)
13. *The Double Galaxy Cluster Abell 2465 III. X-ray and Weak-lensing Observations*, 2017, ApJ, 844, 67
Wegner G.; Umetsu K.; Molnar. S.; Nonino M.; Medezinski E.; and 5 coauthors (including **Lovisari L.**)
14. *The Fraction of Cool-core Clusters in X-Ray versus SZ Samples Using Chandra Observations* , 2017, ApJ, 483, 76
Andrade-Santos F.; Jones C.; Forman W.; **Lovisari L.**; Vikhlinin A.; and 19 coauthors
15. *X-ray analysis of the galaxy group UGC03957 beyond R200 with Suzaku*, 2016, A&A, 592, 37
Thölken S.; **Lovisari L.**; Reiprich T. H.; Hasenbusch J.;
16. *The radio relic in Abell 2256: overall spectrum and implications for electron acceleration*, 2015, A&A, 575, 45
Trasatti M.; Akamatsu H.; **Lovisari L.**; Klein U.; Bonafede A.; and 3 coauthors
17. *Abundance and temperature distributions in the hot intra-cluster gas of Abell 4059*, 2015, A&A, 575, 37
Mernier F.; de Plaa J.; **Lovisari L.**; Pinto C.; Zhang Y.Y.; and 3 coauthors
18. *XMM-Newton and Chandra Cross Calibration Using HIFLUGCS Galaxy Clusters: Systematic Temperature Differences and Cosmological Impact*, 2015, A&A, 575, 30
Schellenberger G.; Reiprich T. H.; **Lovisari L.**; Nevalainen J.; David L.
19. *Scaling properties of a complete X-ray selected galaxy group sample*, 2015, A&A, 573, 118
Lovisari L.; Reiprich T. H.; Schellenberger G.
20. *Extending the $L_X - T$ relation from clusters to groups. Impact of cool core nature, AGN feedback, and selection effects*, 2015, A&A, 573, 75
Bharadwaj V.; Reiprich, T. H.; **Lovisari L.**; Eckmiller H. J.
21. *A metal-rich elongated structure in the core of the group NGC 4325*, 2015, A&A, 573, 66
Laganá T. F.; **Lovisari L.**; Martins L.; Lanfranchi G. A.; Capelato H. V.; Schellenberger G.
22. *Metal distribution in the intracluster medium: a comprehensive numerical study of twelve galaxy clusters*, 2014, A&A, 569, 31
Höller H.; Stöckl J.; Benson A.; Haider M.; Steinhauser D.; **Lovisari L.**; Pranger F.
23. *Constraining galaxy cluster temperatures and redshifts with eROSITA survey data*, 2014, A&A, 567, 65
Borm K.; Reiprich T. H.; Mohammed I.; **Lovisari L.**
24. *Scaling Relations for Galaxy Clusters: Properties and Evolution*, 2013, SSRv, 177, 247
Giodini S.; **Lovisari L.**; Pointecouteau E.; Ettori S.; Reiprich T. H.; Hoekstra H.
25. *Outskirts of Galaxy Clusters*, 2013, SSRv, 177, 195
Reiprich T. H.; Basu K.; Ettori S.; Israel H.; **Lovisari L.**; Molendi, S.; and 3 coauthors
26. *Mass Profiles of Galaxy Clusters from X-ray Analysis*, 2013, SSRv, 177, 119
Ettori S.; Donnarumma A.; Pointecouteau E.; Reiprich T. H.; Giodini S.; **Lovisari L.**; Schmidt R. W.

27. *Scaling relations with a complete sample of galaxy groups*, 2013, AN, 334, 369
Lovisari L.; Reiprich T. H.
 28. *Metals in the ICM: Witnesses of Cluster Formation and Evolution*, 2013, AcPol, 53, 579
Lovisari L.; Laganá T. F.; Borm K.; Schellenberger G.; Reiprich T. H.,
 29. *Gas sloshing and cold front formation in A496*, 2012, MNRAS, 420, 3632
Roediger E.; **Lovisari L.**; Dupke R.; Ghizzardi S.; Brüggén M.; and 2 coauthors
 30. *Inhomogeneous Metal Distribution in the Intra-Cluster Medium* , 2011, A&A, 528, 60
Lovisari L.; Schindler S.; Kapferer W.
 31. *XMM Observations of Metal Abundances in Galaxy Clusters*, 2011, AcPol, 51, 78
Lovisari L.; Schindler S.; Kapferer W.
 32. *Metallicity map of the galaxy cluster A3667*, 2009, A&A, 508, 191
Lovisari L.; Kapferer W.; Schindler S.; Ferrari C.
 33. *The cluster gas mass fraction as a cosmological probe: a revised study*, 2009, A&A, 501, 61
Ettori S.; Morandi A.; Tozzi P.; Balestra I.; Borgani S.; and 3 coauthors (including **Lovisari L.**)
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