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PERSONAL DATA

Born 12 January 1962 -- Perugia, Italy
Nationality Italy & USA
Languages Italian English French
Family Married with 3 children

WORK EXPERIENCE

From 1995 Harvard Smithsonian Center for Astrophysics, Cambridge, USA
Astrophysicist

Within the CFA I am a member of the Chandra X-Ray Center (CXC) which operates the Chandra X-Ray Observatory, NASA's mission for X-ray astronomy launched in 1999.

My duties in the CXC are split between the Science Data System (SDS) group and the Chandra Director's Office (CDO). SDS is responsible for the design, specification, testing and documentation of the Chandra scientific data analysis software and for the support of users analyzing Chandra data. The CDO group assists the Director in the running of the CXC.

Recently the focus of my scientific research has been on multi-wavelength extragalactic surveys, in particular the COSMOS survey, a radio to X-ray survey of a patch of the sky to study galaxy and quasar evolution up to high redshifts in typical environments, with minimal 'cosmic bias'.

1991-1995 Center for EUV Astrophysics, Berkeley, USA
Assistant Research Astronomer

I was a postdoc and later assistant research astronomer at the Center for EUV Astrophysics at the University of California in Berkeley, USA within the Extreme Ultraviolet Explorer Project (EUVE). Launched on June 7 1992, EUVE was the first NASA satellite mission entirely dedicated to observations in the wavelength range from 70 to 760 Å. In addition to my duties connected to the running of the satellite, I studied EUV emission from Active Galactic Nuclei and Planetary Nebulae and the distribution of neutral hydrogen in the interstellar medium.

McKinley Group, Berkeley, USA
Scientific Consultant

At the infancy of the world-wide web and in the pre-google internet world, I collected and reviewed all astronomy-related internet sites available at the time for the book *New Riders' Official Internet Yellow Pages* by C. Maxwell & C.J. Crycz (ISBN: 978-1562054083)

1990-1991 Space Telescope Science Institute, Baltimore, USA
Postdoctoral Fellow

I obtained two fellowships from the *A. Della Riccia* and *B. Bildt* Foundations to work as a post-doctoral fellow at the Space Telescope Science Institute (STScI). There I worked on the AGN/starburst galaxies connection with Prof. Richard Griffiths.

1988-1990 Institut d'Astrophysique, Paris, France
ESA postdoctoral fellow

I obtained a European Space Agency (ESA) PostDoctoral Fellowship to study starburst galaxies in the optical and infrared with Dr. Michel Dennefeld. I also gained a lot of experience with optical telescopes after many observing nights at the Observatoire de Haute Provence.

1987-1988 "Bernocchi" Technical High School, Legnano, Italy
High School Teacher

I taught introductory physics to 9th and 10th graders

Zanichelli Publishing Company, Bologna, Italy
Scientific Consultant

I reviewed the scientific translation in Italian of the book *Surely You're Joking, Mr. Feynman!* by Richard P. Feynman (ISBN 978-8808037183)

EDUCATION

2002 VILSPA XMM SAS workshop, Madrid, Spain
1988 Astrophysics School "Evolution of Galaxies. Astronomical Observations"
Les Houches, France
1988 ESO-OHP Summer School in Astrophysical Observations, Observatoire de
Haute-Provence, France
1987 DEA--Degree of Advanced Studies in Astrophysics and Space Sciences
University of Paris VII, France
1986 Laurea Doctoral degree in Physics University of Milano, Italy
Thesis in Astrophysics: *X-Ray Observations of the Cluster of Galaxies Abell1367*
1980 Maturita' Classica High School degree in Humanities, Liceo Classico "V. Tonolli",
Verbania Pallanza, Italy

FELLOWSHIPS AND AWARDS

PERSONAL

1990 *Blanceflor Boncompagni-Ludovisi Bildt* Foundation Postdoctoral Fellowship
(Stockholm, Sweden)
1988 European Space Agency (ESA) Postdoctoral Fellowship
Angelo Della Riccia Foundation Postdoctoral Fellowship (Florence, Italy)
2000 Special Act Award for the work on the CIAO software
2005 & 2009 Merit awards for role as Chair of Chandra symposia

GROUP

- 2000 NASA Group Achievement Award (CXC Development and Operation Team)
NASA Group Achievement Award (CXC Science team)
American Institute of Aeronautics and Astronautics Space Systems Award (Chandra Team)
Smithsonian National Air and Space Museum Trophy for Current Achievement (Chandra Team)
Harvard-Smithsonian Scientists of the Year Award (Chandra Science Team)
Smithsonian Institution Certificate of Award (Chandra)
Discover Magazine Awards for Technological Innovation (Chandra)

COMPETITIVE GRANT AWARDS

- From 1992 Principal and Co-Investigator in several funded NASA Guest Observer proposals to perform observations with the EUVE, RXTE, BeppoSAX, CHANDRA and NewtonXMM observatories.
Principal Investigator of a funded NASA ADP proposal.

Most recent Chandra and XMM grant awards:

- 2012: Co-I: *Ring galaxies as the cradle of ULXs* (PI: Wolter)
Co-I: *The Cosmos Legacy Survey* (PI: Civano)
2010 Co-I: *A runaway blackhole in the Cosmos* (PI: Civano)
2006 Observer/Co-I: *The Chandra-Cosmos Survey* (PI: Elvis)
2004 Co-I: *Pandora's Box of "Normal" Galaxies* (PI: Wolter)
2002 Co-I: *The Nature of the Composite Seyfert/Star-Forming Galaxies* (PI: Wolter)
2000 Co-I: *An Imaging Observation of NGC4051 in the low state* (PI: Uttley)
1999: PI: *X-Raying the brightest AGN in the sky with the Chandra gratings*
- 1989-1995 Principal and Co-Investigator in several optical proposals to observe at the Kitt Peak National Observatory, Steward Observatory, Multi Mirror Telescope, Lick Observatory (USA) and Observatoire de Haute Provence (France)

PROFESSIONAL AND COMMUNITY SERVICE

- Ongoing Referee for professional journals
Ongoing Mentor for HGWISE (Harvard Graduate Women in Science and Engineering)
Ongoing Principal Organizer of the Chandra/CIAO Workshop series
Ongoing Mentor for several students and postdoc at the CfA
2009 Co-Chair for the "A Decade of Science with Chandra" Symposium
2008-2009 Member then Chair of the Smithsonian Predoctoral Oversight Committee
2005-2008 Elected member of the Smithsonian Astrophysical Observatory Council
2006-2007 Member of the CFA PostDoctoral Fellowship Committee
2005 Chair of the Science Organizing Committee for the "Six Years of Science with Chandra" Symposium
2003-2005 Co-Chair of the Center for Astrophysics Colloquium Series
2000 Reviewer at the Chandra Peer Review Cycle 2
1992-1998 Technical Reviewer at EUVE Peer Review AO1 through AO7.

EDUCATIONAL ACTIVITIES

- Several lessons (talks and hands-on) at the Chandra/CIAO Workshops, Cambridge, MA 2001-2013

- An Introduction to Active Galactic Nuclei lesson at the X-Ray Astronomy School, Cambridge, MA, Aug.2005
- *CIAO for the Chandra X-ray Observatory* lessons within the "High-Energy Astrophysics" course of Prof. S. Holt, F.W.Olin College of Engineering, Needham MA, 2007-2009
- Several lessons about elementary astronomy at the Bishop Elementary School, Arlington, MA
- High school physics teacher

TECHNICAL EXPERTISE

- Twenty years as astrophysicist in the Science Data System Division of the Chandra X-ray Center
- Proficiency in several astronomical data reduction packages (e.g. CIAO, FTOOLS, XSPEC, SAS)
- Extensive experience in software testing and documentation, and in user support
- Working knowledge of a few programming languages
- Extensive experience with astronomical databases
- Four years as a support scientist for the EUVE mission
- Past Experience operating ground-based optical telescopes and spectrographs
- Past Experience in commanding spacecraft and monitoring instrument health and safety

PROFESSIONAL AFFILIATIONS

American Astronomical Society
 International Astronomical Union
 Societa' Astronomica Italiana
 Committee on Space Research (COSPAR)

INVITED AND CONTRIBUTED TALKS

- 1990 *X-Ray Observations of the Cluster of Galaxies A1367*
 Invited Talk, Institute d'Astrophysique de Paris, France
- 1991 *Observations of X-Ray Starburst Galaxy Candidates*
 Invited Talk, Space Telescope Science Institute, Baltimore, USA
- 1992 *Search for Starbursts among X-ray--Selected Galaxies*
 Invited Talk, Center for EUV Astrophysics, Berkeley, USA
- 1992 *First Results from the Extreme Ultraviolet Explorer Satellite.* Invited Talk,
 Osservatorio Astronomico di Torino, Italy
 Osservatorio Astronomico di Bologna, Italy
 Osservatorio Astronomico di Milano-Brera
- 1993 *EUVE, the Interstellar Medium and PKS 2155-304*
 Invited Talk, Space Telescope Science Institute, Baltimore, USA
A Year of Observations with the the Extreme Ultraviolet Explorer Satellite.
 Invited Talk,
 Istituto di Fisica Cosmica del CNR, Milano, Italy
 Osservatorio Astronomico di Padova, Italy
 Osservatorio Astronomico di Firenze-Arcetri, Italy
- 1995 *Active Galactic Nuclei in the Extreme Ultraviolet*
 Invited Talk, Harvard-Smithsonian Center for Astrophysics, Cambridge, USA
Active Galaxies in the Extreme Ultraviolet.
 Contributed Talk, JENAM 95 European Astronomical Society Meeting, Catania, Italy
- 1996 *AGN Variability: an Extreme Ultraviolet View from Deep EUVE Observations.*
 Invited Talk COSPAR Scientific Assembly, E1.4 Meeting "The Variability of AGN and its Relation to Accretion Disk Phenomenology", Birmingham, UK

- AXAF Data Analysis System: Infrastructure and New Features*
Invited Talk, SAX Science Data Center, Rome, Italy
- AGN Variability: an Extreme Ultraviolet View from Deep EUVE Observations*
Invited Talk, Osservatorio Astronomico di Milano-Brera, Italy
- 1995 *The Variability and Spectrum of NGC 4051 from Deep, Simultaneous EUVE and XTE Observations*
Contributed Talk, AAS HEAD meeting, Estes Park, USA
- 2000 *The High Resolution Chandra X-ray Spectrum of 3C273*
Contributed Talk, in "AGN nel 2000", 4th Italian National Conference on AGN, Trieste, Italy

STUDENTS AND POSTDOCS

- 1997-2000 [Ilaria Cagnoni](#) predoctoral student, now manager at Whirlpool Corporation in Italy
- 1999-2000 [Elisa Costantini](#) predoctoral student, now research scientist at Space Research Organization Netherlands-SRON in the Netherlands
- 2003-2004 [Francesca Panessa](#) postdoctoral fellow, now research scientist at the "Istituto di Astrofisica Spaziale e Fisica Cosmica-IASF in Italy

REFERENCES

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BIBLIOGRAPHY (as of 9/26/2013)

REFEREED PAPERS

1. Guarcello, M. G.; Drake, J. J.; Wright, N. J.; Drew, J. E.; Gutermuth, R. A.; Hora, J. L.; Naylor, T.; Aldcroft, T.; Fruscione, A.; García-Alvarez, D.; Kashyap, V. L.; King, R. 2013, *The Astrophysical Journal* [The Protoplanetary Disks in the Nearby Massive Star-forming Region Cygnus OB2](#)
2. Lanzuisi, G., Civano, F., Elvis, M., Salvato, M., Hasinger, G., Vignali, C., Zamorani, G., Aldcroft, T., Brusa, M., Comastri, A., Fiore, F., Fruscione, A., Gilli, R., Ho, L. C., Mainieri, V., Merloni, A., & Siemiginowska, A. 2013, *Monthly Notices of the Royal Astronomical Society* [The Chandra-COSMOS survey - IV. X-ray spectra of the bright sample](#)
3. Civano, F., Elvis, M., Brusa, M., Comastri, A., Salvato, M., Zamorani, G., Aldcroft, T., Bongiorno, A., Capak, P., Cappelluti, N., Cisternas, M., Fiore, F., Fruscione, A., Hao, H., Kartaltepe, J., Koekemoer, A., Gilli, R., Impey, C. D., Lanzuisi, G., Lusso, E., Mainieri, V., Miyaji, T., Lilly, S., Masters, D., Puccetti, S., Schawinski, K., Scoville, N. Z., Silverman, J., Trump, J., Urry, M., Vignali, C., & Wright, N. J. 2012, *The Astrophysical Journal Supplement Series* [The Chandra COSMOS Survey. III. Optical and Infrared Identification of X-Ray Point Sources](#)
4. Civano, F., Elvis, M., Lanzuisi, G., Aldcroft, T., Trichas, M., Bongiorno, A., Brusa, M., Blecha, L., Comastri, A., Loeb, A., Salvato, M., Fruscione, A., Koekemoer, A., Komossa, S., Gilli, R., Mainieri, V., Piconcelli, E., & Vignali, C. 2012, *The Astrophysical Journal* [Chandra High-resolution observations of CID-42, a Candidate Recoiling Supermassive Black Hole](#)
5. Salvato, M., Ilbert, O., Hasinger, G., Rau, A., Civano, F., Zamorani, G., Brusa, M., Elvis, M., Vignali, C., Aussel, H., Comastri, A., Fiore, F., Le Floch, E., Mainieri, V., Bardelli, S., Bolzonella, M., Bongiorno, A., Capak, P., Caputi, K., Cappelluti, N., Carollo, C. M., Contini, T., Garilli, B., Iovino, A., Fotopoulou, S., Fruscione, A., Gilli, R., Halliday, C., Kneib, J.-P., Kakazu, Y., Kartaltepe, J. S., Koekemoer, A. M., Kovac, K., Ideue, Y., Ikeda, H., Impey, C. D., Le Fevre, O., Lamareille, F., Lanzuisi, G., Le Borgne, J.-F., Le Brun, V., Lilly, S., Maier, C., Manohar, S., Masters, D., McCracken, H., Messias, H., Mignoli, M., Mobasher, B., Nagao, T., Pello, R., Puccetti, S., Perez-Montero, E., Renzini, A., Sargent, M., Sanders, D. B., Scodreggio, M., Scoville, N., Shopbell, P., Silvermann, J., Taniguchi, Y., Tasca, L., Tresse, L., Trump, J. R., & Zucca, E. 2011, *The Astrophysical Journal* [Dissecting Photometric Redshift for Active Galactic Nucleus Using XMM- and Chandra-COSMOS Samples](#)
6. Civano, F., Elvis, M., Lanzuisi, G., Jahnke, K., Zamorani, G., Blecha, L., Bongiorno, A., Brusa, M., Comastri, A., Hao, H., Leauthaud, A., Loeb, A., Mainieri, V., Piconcelli, E., Salvato, M., Scoville, N., Trump, J., Vignali, C., Aldcroft, T., Bolzonella, M., Bressert, E., Finoguenov, A., Fruscione, A., Koekemoer, A. M., Cappelluti, N., Fiore, F., Giodini, S., Gilli, R., Impey, C. D., Lilly, S. J., Lusso, E., Puccetti, S., Silverman, J. D., Aussel, H., Capak, P., Frayer, D., Le Floch, E., McCracken, H. J., Sanders, D. B., Schiminovich, D., & Taniguchi, Y. 2010, *The Astrophysical Journal* [A Runaway Black Hole in COSMOS: Gravitational Wave or Slingshot Recoil?](#)
7. Lanzuisi, G., Civano, F., Elvis, M., Aldcroft, T., Fruscione, A., Fiore, F., Mainieri, V., & Vignali, C. 2010, *X-ray Astronomy 2009: Present Status, Multi-Wavelength Approach and Future Perspectives* [X-ray spectral analysis of C-COSMOS sources](#)

8. Wolter, Anna, Fruscione, Antonella, & Bonaventura, Nina 2010, X-ray Astronomy 2009; Present Status, Multi-Wavelength Approach and Future Perspectives [A "Pandora's box" of galaxies](#)
9. Brusa, M., Civano, F., Comastri, A., Miyaji, T., Salvato, M., Zamorani, G., Cappelluti, N., Fiore, F., Hasinger, G., Mainieri, V., Merloni, A., Bongiorno, A., Capak, P., Elvis, M., Gilli, R., Hao, H., Jahnke, K., Koekemoer, A. M., Ilbert, O., Le Floch, E., Lusso, E., Mignoli, M., Schinnerer, E., Silverman, J. D., Treister, E., Trump, J. D., Vignali, C., Zamojski, M., Aldcroft, T., Aussel, H., Bardelli, S., Bolzonella, M., Cappi, A., Caputi, K., Contini, T., Finoguenov, A., Fruscione, A., Garilli, B., Impey, C. D., Iovino, A., Iwasawa, K., Kampczyk, P., Kartaltepe, J., Kneib, J. P., Knobel, C., Kovac, K., Lamareille, F., Leborgne, J.-F., Le Brun, V., Le Fevre, O., Lilly, S. J., Maier, C., McCracken, H. J., Pello, R., Peng, Y.-J., Perez-Montero, E., de Ravel, L., Sanders, D., Scodreggio, M., Scoville, N. Z., Tanaka, M., Taniguchi, Y., Tasca, L., de la Torre, S., Tresse, L., Vergani, D., & Zucca, E. 2010, The Astrophysical Journal [The XMM-Newton Wide-field Survey in the Cosmos Field \(XMM-COSMOS\): Demography and Multiwavelength Properties of Obscured and Unobscured Luminous Active Galactic Nuclei](#)
10. Mainieri, V., Vignali, C., Merloni, A., Civano, F., Puccetti, S., Brusa, M., Gilli, R., Bolzonella, M., Comastri, A., Zamorani, G., Aller, M., Carollo, M., Scarlata, C., Elvis, M., Aldcroft, T. L., Cappelluti, N., Fabbiano, G., Finoguenov, A., Fiore, F., Fruscione, A., Koekemoer, A. M., Contini, T., Kneib, J.-P., Le Fèvre, O., Lilly, S., Renzini, A., Scodreggio, M., Bardelli, S., Bongiorno, A., Caputi, K., Coppa, G., Cucciati, O., de la Torre, S., de Ravel, L., Franzetti, P., Garilli, B., Iovino, A., Kampczyk, P., Knobel, C., Kovač, K., Lamareille, F., Le Borgne, J.-F., Le Brun, V., Maier, C., Mignoli, M., Pello, R., Peng, Y., Perez Montero, E., Ricciardelli, E., Silverman, J. D., Tanaka, M., Tasca, L., Tresse, L., Vergani, D., Zucca, E., Capak, P., Ilbert, O., Impey, C., Salvato, M., Scoville, N., Taniguchi, Y., & Trump, J. 2010, Astronomy and Astrophysics [Ultraluminous X-ray sources out to \$z \sim 0.3\$ in the COSMOS field](#)
11. Swartz, Douglas A., Wolk, Scott J., & Fruscione, Antonella 2010, Proceedings of the National Academy of Science [Chandra's First Decade of Discovery](#)
12. Puccetti, S., Vignali, C., Cappelluti, N., Fiore, F., Zamorani, G., Aldcroft, T. L., Elvis, M., Gilli, R., Miyaji, T., Brunner, H., Brusa, M., Civano, F., Comastri, A., Damiani, F., Fruscione, A., Finoguenov, A., Koekemoer, A. M., & Mainieri, V. 2009, The Astrophysical Journal Supplement Series [The Chandra Survey of the COSMOS Field. II. Source Detection and Photometry](#)
13. Elvis, Martin, Civano, Francesca, Vignali, Cristian, Puccetti, Simonetta, Fiore, Fabrizio, Cappelluti, Nico, Aldcroft, T. L., Fruscione, Antonella, Zamorani, G., Comastri, Andrea, Brusa, Marcella, Gilli, Roberto, Miyaji, Takamitsu, Damiani, Francesco, Koekemoer, Anton M., Finoguenov, Alexis, Brunner, Hermann, Urry, C. M., Silverman, John, Mainieri, Vincenzo, Hasinger, Guenther, Griffiths, Richard, Carollo, Marcella, Hao, Heng, Guzzo, Luigi, Blain, Andrew, Calzetti, Daniela, Carilli, C., Capak, Peter, Etori, Stefano, Fabbiano, Giuseppina, Impey, Chris, Lilly, Simon, Mobasher, Bahram, Rich, Michael, Salvato, Mara, Sanders, D. B., Schinnerer, Eva, Scoville, N., Shopbell, Patrick, Taylor, James E., Taniguchi, Yoshiaki, & Volonteri, Marta 2009, The Astrophysical Journal Supplement Series [The Chandra COSMOS Survey. I. Overview and Point Source Catalog](#)
14. Cappelluti, N., Brusa, M., Hasinger, G., Comastri, A., Zamorani, G., Finoguenov, A., Gilli, R., Puccetti, S., Miyaji, T., Salvato, M., Vignali, C., Aldcroft, T., Böhringer, H., Brunner, H.,

- Civano, F., Elvis, M., Fiore, F., Fruscione, A., Griffiths, R. E., Guzzo, L., Iovino, A., Koekemoer, A. M., Mainieri, V., Scoville, N. Z., Shopbell, P., Silverman, J., & Urry, C. M. 2009, *Astronomy and Astrophysics* [The XMM-Newton wide-field survey in the COSMOS field. The point-like X-ray source catalogue](#)
15. Fiore, F., Puccetti, S., Brusa, M., Salvato, M., Zamorani, G., Aldcroft, T., Aussel, H., Brunner, H., Capak, P., Cappelluti, N., Civano, F., Comastri, A., Elvis, M., Feruglio, C., Finoguenov, A., Fruscione, A., Gilli, R., Hasinger, G., Koekemoer, A., Kartaltepe, J., Ilbert, O., Impney, C., Le Floch, E., Lilly, S., Mainieri, V., Martinez-Sansigre, A., McCracken, H. J., Menci, N., Merloni, A., Miyaji, T., Sanders, D. B., Sargent, M., Schinnerer, E., Scoville, N., Silverman, J., Smolcic, V., Steffen, A., Santini, P., Taniguchi, Y., Thompson, D., Trump, J. R., Vignali, C., Urry, M., & Yan, L. 2009, *The Astrophysical Journal* [Chasing Highly Obscured QSOs in the COSMOS Field](#)
 16. Panessa, Francesca, Wolter, Anna, Pellegrini, Silvia, Fruscione, Antonella, Bassani, Loredana, Della Ceca, Roberto, Palumbo, Giorgio G. C., & Trinchieri, Ginevra 2005, *The Astrophysical Journal* [The Nature of Composite Seyfert/Star-forming Galaxies Revealed by X-Ray Observations](#)
 17. Nicastro, Fabrizio, Mathur, Smita, Elvis, Martin, Drake, Jeremy, Fiore, Fabrizio, Fang, Taotao, Fruscione, Antonella, Krongold, Yair, Marshall, Herman, & Williams, Rik 2005, *The Astrophysical Journal* [Chandra Detection of the First X-Ray Forest along the Line of Sight To Markarian 421](#)
 18. Fruscione, Antonella, Greenhill, Lincoln J., Filippenko, Alexei V., Moran, James M., Herrnstein, James R., & Galle, Elizabeth 2005, *The Astrophysical Journal* [X-Ray Luminosity and Absorption Column Fluctuations in the H₂O Maser Galaxy NGC 4258 from Weeks to Years](#)
 19. Nicastro, Fabrizio, Mathur, Smita, Elvis, Martin, Drake, Jeremy, Fang, Taotao, Fruscione, Antonella, Krongold, Yair, Marshall, Herman, Williams, Rik, & Zezas, Andreas 2005, *Nature* [The mass of the missing baryons in the X-ray forest of the warm-hot intergalactic medium](#)
 20. Uttley, P., Taylor, R. D., McHardy, I. M., Page, M. J., Mason, K. O., Lamer, G., & Fruscione, A. 2004, *Nuclear Physics B Proceedings Supplements* [Catching NGC 4051 in the low state with XMM-Newton](#)
 21. Uttley, P., Taylor, R. D., McHardy, I. M., Page, M. J., Mason, K. O., Lamer, G., & Fruscione, A. 2004, *Monthly Notices of the Royal Astronomical Society* [Complex X-ray spectral behaviour of NGC 4051 in the low flux state](#)
 22. Uttley, Philip, Fruscione, Antonella, McHardy, Ian, & Lamer, Georg 2003, *The Astrophysical Journal* [Catching NGC 4051 in the Low State with Chandra](#)
 23. Nicastro, Fabrizio, Zezas, Andreas, Drake, Jeremy, Elvis, Martin, Fiore, Fabrizio, Fruscione, Antonella, Marengo, Massimo, Mathur, Smita, & Bianchi, Stefano 2002, *The Astrophysical Journal* [Chandra Discovery of a Tree in the X-Ray Forest toward PKS 2155-304: The Local Filament?](#)
 24. Drake, Jeremy J., Marshall, Herman L., Dreizler, Stefan, Freeman, Peter E., Fruscione, Antonella, Juda, Michael, Kashyap, Vinay, Nicastro, Fabrizio, Pease, Deron O., Wargelin, Bradford J., & Werner, Klaus 2002, *The Astrophysical Journal* [Is RX J1856.5-3754 a Quark Star?](#)
 25. Yusef-Zadeh, F., Law, C., Wardle, M., Wang, Q. D., Fruscione, A., Lang, C. C., & Cotera, A. 2002, *The Astrophysical Journal* [Detection of X-Ray Emission from the Arches Cluster near the Galactic Center](#)

26. Puchnarewicz, E. M., Mason, K. O., Siemiginowska, A., Cagnoni, I., Comastri, A., Fiore, F., & Fruscione, A. 2001, X-ray Astronomy: Stellar Endpoints, AGN, and the Diffuse X-ray Background [Weighing the black hole in the narrow-line Seyfert 1 galaxy, RE J1034+396](#)
27. Costantini, E., Salvini, C., Comastri, A., Fruscione, A., Mathur, S., Nicastro, F., Stirpe, G. M., & Wilkes, B. 2001, X-ray Astronomy: Stellar Endpoints, AGN, and the Diffuse X-ray Background [The complex and variable absorption of NGC 3516 observed by BeppoSAX](#)
28. Callanan, Paul J., Drake, Jeremy J., Fruscione, Antonella, & Christian, Damian 2001, X-ray Astronomy: Stellar Endpoints, AGN, and the Diffuse X-ray Background [An EUVE observation of the globular cluster NGC 1851](#)
29. Puchnarewicz, E. M., Mason, K. O., Siemiginowska, A., Fruscione, A., Comastri, A., Fiore, F., & Cagnoni, I. 2001, The Astrophysical Journal [Constraining the Black Hole Mass and Accretion Rate in the Narrow-Line Seyfert 1 Galaxy RE J1034+396](#)
30. Marshall, H. L., Harris, D. E., Grimes, J. P., Drake, J. J., Fruscione, A., Juda, M., Kraft, R. P., Mathur, S., Murray, S. S., Ogle, P. M., Pease, D. O., Schwartz, D. A., Siemiginowska, A. L., Vrtilik, S. D., & Wargelin, B. J. 2001, The Astrophysical Journal [Structure of the X-Ray Emission from the Jet of 3C 273](#)
31. Cappi, M., Mazzotta, P., Elvis, M., Burke, D. J., Comastri, A., Fiore, F., Forman, W., Fruscione, A., Green, P., Harris, D., Hooper, E. J., Jones, C., Kaastra, J. S., Kellogg, E., Murray, S., McNamara, B., Nicastro, F., Ponman, T. J., Schlegel, E. M., Siemiginowska, A., Tananbaum, H., Vikhlinin, A., Virani, S., & Wilkes, B. 2001, The Astrophysical Journal [Chandra Study of an Overdensity of X-Ray Sources around Two Distant \(\$Z \sim 0.5\$ \) Clusters](#)
32. Cagnoni, I., Papadakis, I. E., & Fruscione, A. 2001, The Astrophysical Journal [Four Years of Extreme Ultraviolet Observations of Markarian 421. II. Temporal Analysis](#)
33. Cagnoni, I. & Fruscione, A. 2001, The Astrophysical Journal [Four Years of Extreme Ultraviolet Observations of Markarian 421. I. Spectral Analysis](#)
34. Costantini, E., Nicastro, F., Fruscione, A., Mathur, S., Comastri, A., Elvis, M., Fiore, F., Salvini, C., Stirpe, G. M., Vignali, C., Wilkes, B., O'Brien, P. T., & Goad, M. R. 2000, The Astrophysical Journal [The Complex X-Ray Absorbers of NGC 3516 Observed by BEPPO-SAX](#)
35. Callanan, P. J., Drake, J. J., Fruscione, A., & Christian, D. 2000, Astronomy and Astrophysics [An EUVE observation of the globular cluster NGC 1851: The second EUV detection of a low mass X-ray binary?](#)
36. Uttley, P., McHardy, I. M., Papadakis, I. E., Cagnoni, I., & Fruscione, A. 2000, Monthly Notices of the Royal Astronomical Society [Simultaneous EUV and X-ray variability of NGC 4051](#)
37. Callanan, Paul J., Drake, Jeremy J., & Fruscione, Antonella 1999, The Astrophysical Journal [An EUVE Observation of the Globular Cluster M15: The First Detection of a Low-Mass X-Ray Binary?](#)
38. Uttley, P., McHardy, I. M., Papadakis, I. E., Guainazzi, M., & Fruscione, A. 1999, Monthly Notices of the Royal Astronomical Society [The swan song in context: long-time-scale X-ray variability of NGC 4051](#)
39. Uttley, P., McHardy, I. M., Papadakis, I. E., Cagnoni, I., & Fruscione, A. 1999, Nuclear Physics B Proceedings Supplements [X-ray spectral variability of NGC 4051](#)
40. Guainazzi, M., Nicastro, F., Fiore, F., Matt, G., McHardy, I., Orr, A., Barr, P., Fruscione, A., Papadakis, I., Parmar, A. N., Uttley, P., Perola, G. C., & Piro, L. 1998, Monthly Notices of

the Royal Astronomical Society [A swan song: the disappearance of the nucleus of NGC 4051 and the echo of its past glory](#)

41. Drake, Jeremy J., Fruscione, Antonella, Hoare, Melvin G., & Callanan, Paul 1998, The Astrophysical Journal [A Deep Extreme Ultraviolet Explorer Observation of the Extreme Ultraviolet Transient RE J1255+266](#)
42. Fruscione, Antonella 1998, Advances in Space Research [AGN variability: an extreme ultraviolet view from deep EUVE observations](#)
43. Craig, Nahide & Fruscione, Antonella 1997, The Astronomical Journal [Optical Identification of Joint EUVE and ROSAT Detections in the Southern Hemisphere: Soft Active Galactic Nuclei.](#)
44. von Montigny, C., Aller, H., Aller, M., Bruhweiler, F., Collmar, W., Courvoisier, T. J.-L., Edwards, P. G., Fichtel, C. E., Fruscione, A., Ghisellini, G., Hartman, R. C., Johnson, W. N., Kafatos, M., Kii, T., Kniffen, D. A., Lichti, G. G., Makino, F., Mannheim, K., Marscher, A. P., McBreen, B., McHardy, I., Pesce, J. E., Pohl, M., Ramos, E., Reich, W., Robson, E. I., Sasaki, K., Teraesranta, H., Tornikoski, M., Urry, C. M., Valtaoja, E., Wagner, S., & Weekes, T. 1997, The Astrophysical Journal [Multiwavelength Observations of 3C 273 in 1993--1995](#)
45. Ramos, E., Kafatos, M., Fruscione, A., Bruhweiler, F. C., McHardy, I. M., Hartman, R. C., Titarchuk, L. G., & von Montigny, C. 1997, The Astrophysical Journal [Contemporaneous IUE, EUVE, and High-Energy Observations of 3C 273](#)
46. Griffiths, R. E., della Ceca, R., Georgantopoulos, I., Boyle, B. J., Stewart, G. C., Shanks, T., & Fruscione, A. 1996, Monthly Notices of the Royal Astronomical Society [A Deep ROSAT Survey - X. X-ray-luminous narrow-emission-line galaxies](#)
47. Fruscione, Antonella 1996, The Astrophysical Journal [X-Ray--selected Extreme-Ultraviolet Galaxies: Scraping the Bottom of the "Invisible" Barrel](#)
48. Mathioudakis, M., Drake, J. J., Craig, N., Kilkenny, D., Doyle, J. G., Sirk, M. M., Dupuis, J., Fruscione, A., Christian, C. A., & Abbott, M. J. 1995, Astronomy and Astrophysics [Optical identification of EUV sources: the secrets of EUVE J2056-17.1.](#)
49. Craig, N., Fruscione, A., Dupuis, J., Mathioudakis, M., Drake, J. J., Abbott, M., Christian, C., Green, R., Boroson, T., & Howell, S. B. 1995, The Astronomical Journal [The EUVE Optical Identification Campaign II: Late-Type and White Dwarf Stars](#)
50. Monsignori Fossi, Brunella C., Landini, Massimo, Fruscione, Antonella, & Dupuis, Jean 1995, The Astrophysical Journal [Extreme-Ultraviolet Spectroscopy and Photometry of EQ Pegasi](#)
51. Mathioudakis, M., Fruscione, A., Drake, J. J., McDonald, K., Bowyer, S., & Malina, R. F. 1995, Astronomy and Astrophysics [Activity versus rotation in the extreme ultraviolet.](#)
52. Vennes, S., Drake, J. J., Mathioudakis, M., Welsh, B., Fruscione, A., Hall, D. T., Warren, J., & Howell, S. B. 1995, Irish Astronomical Journal [Erratum - a Preliminary Review of EUVE Science](#)
53. Fruscione, Antonella, Drake, Jeremy J., McDonald, Kelley, & Malina, Roger F. 1995, The Astrophysical Journal [A volume-limited survey of High Galactic latitude planetary nebulae with the Extreme Ultraviolet Explorer](#)
54. Fruscione, A. 1995, Irish Astronomical Journal [EUVE: a new window to extragalactic space.](#)
55. Vennes, S., Drake, J. J., Mathioudakis, M., Welsh, B., Fruscione, A., Hall, D. T., Warren, J., & Howell, S. B. 1995, Irish Astronomical Journal [A Preliminary Review of EUVE Science](#)
56. Marshall, H. L., Fruscione, A., & Carone, T. E. 1995, The Astrophysical Journal [Active galaxies observed during the Extreme Ultraviolet Explorer all-sky survey](#)

57. McDonald, K., Craig, N., Sirk, M. M., Drake, J. J., Fruscione, A., Vallerga, J. V., & Malina, R. F. 1994, The Astronomical Journal [Serendipitous EUV sources detected during the first year of the Extreme Ultraviolet Explorer right angle program](#)
58. Fruscione, Antonella, Hawkins, Isabel, Jelinsky, Patrick, & Wiercigroch, Alexandria 1994, The Astrophysical Journal Supplement Series [The distribution of neutral hydrogen in the interstellar medium. 1: The data](#)
59. Fruscione, Antonella, Bowyer, Stuart, Konigl, Arieh, & Kahn, Steven M. 1994, The Astrophysical Journal [Extreme ultraviolet spectroscopy of PKS 2155-304](#)
60. Malina, R. F., Marshall, H. L., Antia, B., Christian, C. A., Dobson, C. A., Finley, D. S., Fruscione, A., Girouard, F. R., Hawkins, I., Jelinsky, P., Lewis, J. W., McDonald, J. S., McDonald, K., Patterer, R. J., Saba, V. W., Sirk, M., Stroozas, B. A., Vallerga, J. V., Vedder, P. W., Wiercigroch, A., & Bowyer, S. 1994, The Astronomical Journal [Extreme Ultraviolet Explorer Bright Source List](#)
61. Craig, N., Chen, T., Hawkins, I., & Fruscione, A. 1993, Journal of the British Interplanetary Society [The EUVE satellite survey database](#)
62. Marshall, H. L., Carone, T. E., & Fruscione, A. 1993, The Astrophysical Journal [Observations of PKS 2155-304 with the Extreme Ultraviolet Explorer](#)
63. Fruscione, Antonella & Griffiths, Richard E. 1991, The Astrophysical Journal [Search for starbursts among X-ray-selected galaxies - Optical spectroscopy](#)
64. Fruscione, A. & Gavazzi, G. 1990, Astronomy and Astrophysics [X-ray emission from UGC 6697 in A 1367](#)

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Fruscione, Antonella; McDowell, Jonathan C.; Allen, Glenn E.; Brickhouse, Nancy S.; Burke, Douglas J.; Davis, John E.; Durham, Nick; Elvis, Martin; Galle, Elizabeth C.; Harris, Daniel E.; Huenemoerder, David P.; Houck, John C.; Ishibashi, Bish; Karovska, Margarita; Nicastro, Fabrizio; Noble, Michael S.; Nowak, Michael A.; Primini, Frank A.; Siemiginowska, Aneta; Smith, Randall K.; Wise, Michael in "Observatory Operations: Strategies, Processes, and Systems". Edited by Silva, David R.; Doxsey, Rodger E.. Proceedings of the SPIE, Volume 6270, pp. 62701V (2006).

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