

Amati Lorenzo

Position: ICRANet external collaborator
(researcher at INAF – IASF Bologna)



Short CV

Lorenzo Amati was born in Modena, Italy, in 1966. He graduated in Astronomy at the University of Bologna in 1991 and received the PhD degree in astronomy from University "La Sapienza" of Rome in 1999. Since 1998, Lorenzo Amati is a research staff member at the Institute of Space Astrophysics and Cosmic Physics (IASF) in Bologna, which is part of the Italian National Institute for Astrophysics (INAF). He is also Adjunct Professor of the Faculty of the International Center for Relativistic Astrophysics Network (ICRANet). His field of research is high energy astrophysics, with particular emphasis on Gamma-Ray Bursts (GRB) studies. Under this respect, his research highlights include the discovery (in 2000) of a transient X-ray absorption edge in the first 13 s of GRB 990705, leading to the first estimate of a GRB redshift based on X-ray data, and the discovery of a strong correlation between the photon energy at which GRB spectra peaks and their radiated energy (known as "Amati relation"), which has relevant implications for the physics and possible cosmological use of these phenomena. Lorenzo Amati is also involved in the study (science case and instrument concept) of future missions for GRB studies and dedicates a minor part of his research work to the study of X-ray binaries.

I Scientific Work

My scientific collaboration with ICRANet is focused on Gamma-Ray Burst (GRB) astrophysics, with particular emphasis on the testing of the fireshell model against X-ray and gamma-ray data of the prompt emission. In particular, in 2010 we concentrated on the physical explanation of the $E_{p,i}$ – Eiso ("Amati") correlation, the identification and interpretation of "disguised" short GRBs, based also on their location and evolution in the $E_{p,i}$ – Eiso plane, the synthesis of prompt emission spectra, with particular emphasis on the explanation of the soft X-ray spectral data.

Besides my collaboration with ICRANet, my main scientific activity includes: spectral, timing and correlation properties of GRBs, investigation of the cosmological use of GRBs, study of the scientific case and concept design of GRB detectors for future missions, X-ray spectral and timing properties of X-ray binaries.

II Conferences and educational activities

Conferences and Other External Scientific Work

November 2010: "Gamma-Ray Burst 2010 Conference", Annapolis, USA (oral presentation)

September 2010: "8th Workshop on Science with the New Generation of High Energy Gamma-ray Experiments", Trieste, Italy (oral presentation)

July 2010: "The second Galileo - Xu Guangqi meeting", Ventimiglia, Italy (oral presentation)

May 2010: "Vulcano Workshop 2010 - Frontier Objects in Astrophysics and Particle Physics", Vulcano, Italy (invited oral presentation)

May 2010: "54th Meeting of the Italian Astronomical Society (SAIT)", Napoli, Italy (oral presentation)

April 2010: "8th AGILE Mini-Workshop - The Third Birthday" Bologna, Italy (oral presentation)

Work With Students

Discussions and joint data analysis of GRBs with some of the ICRANet IRAP Ph.D. students (e.g., collaborations with L. Caito on GRB 071227, L. Izzo on the cosmological use of the $E_{p,i}$ – Eiso correlation).
Lectures at the IRAP Ph.d. LECTURES, March 22-26, 2010, University of Ferrara (Italy)
Lectures at the IRAP Ph.d. Erasmus Mundus School (6-24 Sept. 2010, Nice)

III Service activities

Within ICRANet

- Member of the International Scientific Advisory Committee of the 2nd Galileo - Guangqui
- Member of Commissions for the Discussion of the Thesis of IRAP PhD: Students at Rome University “La Sapienza”.

Outside ICRANet

- Reviewer of several articles for the main astrophysical journals (ApJ, A&A, MNRAS, JCAP, ...)
- Member of the Editorial Board of “Galaxies” (MDPI) and “ISRN Astronomy & Astrophysics” (HINDAWI)

2010 list of Publications

Refereed

C. Guidorzi, M. La Capra, F. Frontera, E. Montanari, L. Amati, F. Calura, L. Nicastro,, M. Orlandini, 2010, " Spectral catalogue of bright gamma-ray bursts detected with the BeppoSAX/GRBM " , Astronomy & Astrophysics, in press

A. de Ugarte Postigo, I. Horváth, P. Veres, Z. Bagoly, D. A. Kann, C. C. Thöne, L. G. Balazs, P. D'Avanzo, M. A. Aloy, S. Foley, S. Campana, J. Mao, P. Jakobsson, S. Covino, J. P. U. Fynbo, J. Gorosabel, A. J. Castro-Tirado, L. Amati, M. Nardini, 2010, " Characteristics of Swift's intermediate-population bursts " , Astronomy & Astrophysics, in press

L. Caito, L. Amati, M.G. Bernardini, C.L. Bianco, G. De Barros, L. Izzo, B. Patricelli, R. Ruffini, 2010, " GRB 071227: an additional case of disguised short burst " , Astronomy & Astrophysics, 521, 80

S. Covino, S. Campana, M. L. Conciatore, V. D.Elia, E. Palazzi, C. C. Thoene, S. D. Vergani, K. Wiersema, M. Brusasca, A. Cucchiara, B.E. Cobb, A. Fernandez-Soto, D.A. Kann, D. Malesani, N.R. Tanvir, L.A. Antonelli, M. Bremer, A.J. Castro-Tirado, A. de Ugarte Postigo, E. Molinari, L. Nicastro, M. Stefanon, V. Testa, G. Tosti, F. Vitali, L. Amati, et al., 2010, " Challenging GRB models through the broadband dataset of GRB060908 " , Astronomy & Astrophysics, 521, 53

L. Amati, 2010, " The correlation between peak photon energy and radiated energy in Gamma-Ray Bursts " , Journal of the Korean Physical Society, 56, 1603

Conference proceedings

L. Amati, 2010, "The $E_{p,i}$ - Eiso correlation and Fermi Gamma-Ray Bursts", 2010, Conference Proceedings of the Italian Physical Society, Vol. 102, pag. 71

Frontera, F.; Amati, L.; Guidorzi, C.; Landi, R.; La Parola, V., 2010, "Memorie della Società Astronomica Italiana, v.81, p.426

Campana, R.; Pacciani, L.; Feroci, M.; Costa, E.; Del Monte, E.; Donnarumma, I.; Evangelista, Y.; Lazzarotto, F.; Masi, M.; Muleri, F.; Rubini, A.; Rapisarda, M.; Amati, L., et al., "A concept for a lightweight, low-power and sensitive Silicon-based All Sky Monitor for transient sources and Gamma Ray Bursts", AIP Conference Proceedings, Volume 1248, pp. 577-578

Campana, R.; Feroci, M.; Vacchi, A.; Labanti, C.; Zampa, G.; Del Monte, E.; Evangelista, Y.; Muleri, F.; Pacciani, L.; Rubini, A.; Soffitta, P.; Costa, E.; Donnarumma, I.; Lazzarotto, F.; Mastropietro, M.; Morelli, E.; Rapisarda, M.; Fuschino, F.; Marisaldi, M.; Bonvicini, V.; Rashevsky, A.; Zampa, N.; Perotti, F.; Amati, L.; et al., 2010, "Concept for an innovative wide-field camera for x-ray astronomy", Proceedings of the SPIE, Volume 7732, pp. 77324