

Patricelli Barbara

Position: Post doc researcher

Period covered: January 2010 – December 2010



I. Scientific Work

- Study of the electrodynamics of Neutron Star (NS) Core.
- Study of the outer crust of NS. Study of a possible correlation between the mass of the outer crust and the B parameter of the fireshell model of Gamma Ray Bursts (GRB).
- Study of the prompt emission of high energetic GRBs (burst with an isotropic energy $E_{\text{iso}} \geq 10^{54}$ erg) within the fireshell model. Introduction of a new spectral energy distribution of the photons in the comoving frame of the fireshell to explain the observational properties of the prompt emission of these sources.
- Study of the X-ray flares in the context of the fireshell model, assuming that they are produced in the interaction with an inhomogeneous CircumBurst Medium (CBM). Application of a 2-dimensional numerical code for the CBM distribution to reproduce the X-ray flares observed in the light curve of GRB 050904.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

- i. First Cesare Lattes meeting of Gamma Ray Bursts, Black Holes and Supernovae, February 25 – March 3, 2007, Mangaratiba, Brazil
- ii. Fourth Italian – Sino Workshop on Relativistic Astrophysics, June 25 - 30, 2007, Pescara, Italy
- iii. National school of Astrophysics, September 13 – 22, 2007, San Servolo (Venezia), Italy
- iv. April meeting of the American Physical Society, April 12 – 15, 2008, Saint Louis, Missouri – USA
- v. Fifth Italian – Sino Workshop on Relativistic Astrophysics, May 28 – June 1, 2008, Taipei – Hualien, Taiwan
- vi. Third Stueckelberg Workshop on Relativistic Field Theories, July 8 – 18, 2008, Pescara, Italy
- vii. XIII Brazilian School of Cosmology and Gravitation, July 20 – August 2, 2008, Rio de Janeiro, Brazil
- viii. Probing stellar populations out to the distant universe, September 7 – 19, 2008, Cefalù (Palermo), Italy
- ix. The Stars, the Sun, the Universe and General Relativity, May 26 – 29, 2009, Fortaleza, Brazil
- x. Sixth Italian – Sino Workshop on Relativistic Astrophysics, June 29 – July 1, 2009, Pescara, Italy
- xi. XII Marcel Grossman Meeting, July 12 – 18, 2009, Paris, France
- xii. The Shocking Universe: Gamma Ray Bursts and High Energy shock phenomena, September 14 - 19, 2009, San Servolo (Venezia), Italy
- xiii. First Galileo- Xu Guangqi meeting, October 26 – 30, 2009, Shanghai, China
- xiv. Deciphering the Ancient Universe with Gamma-Ray Bursts, April 19 – 23, 2010, Kyoto, Japan
- xv. Second Galileo- Xu Guangqi meeting, July 12 – 18, 2010, Ventimiglia, Italy

2010 List of Publications

L. Caito, L. Amati, M.G. Bernardini, C.L. Bianco, L. Izzo, G. de Barros, B. Patricelli, R. Ruffini, “GRB 071227: an additional case of a disguised short burst”, accepted for publication on A&A in date 24/06/2010, DOI: 10.1051/0004-6361/201014640 (arXiv:1006.4842v2)

L. Izzo, M. G. Bernardini, C. L. Bianco, L. Caito, G. de Barros, B. Patricelli, R. Ruffini, “GRB 090423 at redshift 8.1: a theoretical interpretation”, in the Proceedings of the “11th Italian-Korean Symposium on Relativistic Astrophysics” in Seoul, Korea, November 2 - 4, 2009, Journal of the Korean Physical Society, Vol. 57, pp. 551-556 (2010)

B. Patricelli, J. A. Rueda H., R. Ruffini, "On the Crust of Neutron Stars", in the Proceedings of the "Third Stueckelberg Workshop on Relativistic Field Theories" in Pescara (Italy), July 8 - 18, 2008, eds. N. Carlevaro and G.S. Vereshchagin, Cambridge Scientific Publisher (2010)

J. A. Rueda H., B. Patricelli, M. Rotondo, R. Ruffini, S- S. Xue, "The Extended Nuclear Matter Model with Smooth Transition Surface", in the Proceedings of the "Third Stueckelberg Workshop on Relativistic Field Theories" in Pescara (Italy), July 8 - 18, 2008, eds. N.Carlevaro and G.S. Vereshchagin, Cambridge Scientific Publisher (2010) (arXiv:0903.4282v1)

B. Patricelli, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, R. Ruffini and G.S. Vereshchagin, "A new spectral energy distribution of photons in the fireshell model of GRBs", in the Proceedings of "The Shocking Universe: Gamma Ray Bursts and High Energy Shock phenomena in the Universe" in Venice, Italy, September 14 - 18, 2009, SIF Conference Proceedings, Vol. 102, pp. 559-560 (2010)

L. Izzo, M. G. Bernardini, C. L. Bianco, L. Caito, G. de Barros, B. Patricelli, R. Ruffini, "GRB 090423 in the fireshell scenario", in the Proceedings of "The Shocking Universe: Gamma Ray Bursts and High Energy Shock phenomena in the Universe" in Venice, Italy, September 14 - 18, 2009, SIF Conference Proceedings, Vol. 102, pp. 437-439 (2010)

A.G. Aksenov, M.G. Bernardini, C.L. Bianco, L. Caito, C. Cherubini, G. de Barros, A. Geralico, L. Izzo, F.A. Masucci, B. Patricelli, M. Rotondo, J.A. Rueda Hernandez, R. Ruffini, G. Vereshchagin and S.-S. Xue, "The fireshell model for gamma-ray bursts", in the Proceedings of "The Shocking Universe: Gamma Ray Bursts and High Energy Shock phenomena in the Universe" in Venice, Italy, September 14 - 18, 2009, SIF Conference Proceedings, Vol. 102, pp. 451-460 (2010)

M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, B. Patricelli, R. Ruffini, "The end of the prompt emission within the fireshell model", in the Proceedings of "The Shocking Universe: Gamma Ray Bursts and High Energy Shock phenomena in the Universe" in Venice, Italy, September 14 - 18, 2009, SIF Conference Proceedings, Vol. 102, pp. 489-490 (2010)

B. Patricelli, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, R. Ruffini, "Black Holes in Gamma Ray Bursts", in the Proceedings of the "Deciphering the Ancient Universe with Gamma-Ray Bursts" in Kyoto, Japan, April 19 - 23, 2010, AIP Conference Proceedings, Vol. 1279, pp. 406-408 (2010)

L. Izzo, M.G. Bernardini, C.L. Bianco, L. Caito, B. Patricelli, L.J. Rangel Lemos, R. Ruffini, "On GRB 080916C and GRB 090902B observed by the Fermi satellite", in the Proceedings of the "Deciphering the Ancient Universe with Gamma-Ray Bursts" in Kyoto, Japan, April 19 - 23, 2010, AIP Conference Proceedings, Vol. 1279, pp. 406-408 (2010)

C. L. Bianco, M. G. Bernardini, L. Caito, G. De Barros, L. Izzo, B. Patricelli, R. Ruffini, "Disguised Short Bursts and the Amati Relation", in the Proceedings of the "Deciphering the Ancient Universe with Gamma-Ray Bursts" in Kyoto, Japan, April 19 - 23, 2010, AIP Conference Proceedings, Vol. 1279, pp. 299-301 (2010)