Frontera Filippo

Position: Full professor, University of Ferrara
Period covered: 2010

I. Scientific Work

Experimental and observational X-/gamma-ray astronomy, in particular:

a. Gamma-ray lens development;
b. Payload study of the MIRAX mission (collaboration with INPE, Brazil);
c. Observational studies of GRB prompt emission;
d. Observational studies of compact objects in binary systems

Filippo Frontera is full professor of Experimental Physics at the University of Ferrara, Engineering Faculty. Previously, for about 16 years, from 1969 until 1985, he was researcher of the National Research Council (CNR) with the Institute of Technology and Study of Extraterrestrial Radiations (TESRE) in Bologna, now Institute of Space Astrophysics and Cosmic Physics (IASF) of the National Institute of Astrophysics (INAF), where he continues to coordinate an X-ray astronomy group.

He is Chair of the Doctorate program in Physics of the Physics Department of University of Ferrara, where is responsible of the High Energy Astrophysics Group, that is engaged in theoretical, observational and experimental researches of X-ray astronomy.

Since his graduation degree 'Laurea' at the Bologna University, his main scientific activity has concerned experimental and observational hard X-ray astronomy. He has been Principal Investigator (PI) of several hard X-ray astronomy experiments successfully launched with stratospheric balloons from different balloon bases (Italy, France, USA and Australia). He has been PI of the high energy experiment PDS (Phoswich Detection System) and Gamma-Ray Burst Monitor aboard the BeppoSAX satellite, both of which had a key role in the advancement of the high energy astrophysics: PDS was the most sensitive instrument among the high energy (15-300 keV) telescopes launched thus far, and GRBM had a key role for the afterglow discovery of Gamma Ray Bursts (GRBs). More recently he has been Co-Investigator (Co-I) of the JEM-X experiment aboard the INTEGRAL satellite now in flight, developing the field collimator of the instrument and a peculiar hard X-ray facility for its ground calibration. This facility, now being expanded in a tunnel of 100 m length (LARIX), is proposed to EU as hard X-ray facility with trans-national access.

His current main research focus is for GRBs and for compact galactic and extragalactic sources (AGN). Among current experimental projects, he is responsible of the project “Laue”, supported by the Italian Space Agency and devoted to the development of a hard X-/gamma-ray focusing telescope (70/100-600 keV) based on Laue lenses.

He is author of about three hundred publications in international refereed journals, among which Nature and Science, and invited speaker at many international conferences. His papers mainly concern experimental X-ray astronomy and results of X-ray observations of celestial sources and GRBs. Given the high number of citations (currently more than 13000) of his publications, he appears among the “highly cited researchers” in the ISI Web of Knowledge. He is referee for several international journals.

For the discovery of X-ray afterglows from celestial Gamma-Ray Bursts, he is among the winners of the 1997 Bruno Rossi Prize awarded by the American Astronomical Society and of the 2002 Descartes Prize for Science awarded by the European Union Committee. For the discovery of the Afterglow from Gamma Ray Bursts with BeppoSAX, he has received the “Enrico Fermi Prize 2010” awarded by the Italian Physical Society in September 2010.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

a. IRAP-PhD school, Nice, February 2010

b. IRAP-PhD school, Ferrara, March 2010
c. Erasmus Mundus IRAP-PhD school, Nice, September 2010

II b. Work With Students
yes, with 2 PhD students in Physics, University of Ferrara

II c. Diploma thesis supervision
Yes, with a PhD student in Physics (Lara Sambo), University of Ferrara

II d. Other Teaching Duties
2 Semester Courses:
a. Astronomical Observations
b. Observation of Celestial X-rays

II e. Work With Postdocs
Yes, with 2 PostDocs (Ruben Farinelli, Gianluca Loffredo and Enrico Virgilli) a Physics Dept University of Ferrara

III. Service activities
III a. Outside ICRANet
Director of the PhD program in Physics, University of Ferrara