

REPORT ON THE RADIONET3 NETWORKING ACTIVITY

TITLE: BOLOGNA HIGH ENERGY MEETING (BOHEME) 2014

DATE: *7-9 APRIL 2014* **TIME:** (WHOLE DAY)

LOCATION: *BOLOGNA, ITALY*

MEETING WEBPAGE <https://hangar.iasfbo.inaf.it/boheme/>

HOST INSTITUTE: *INAF ISTITUTO DI RADIOASTRONOMIA*
INAF IASF-BO

PARTICIPANTS NO: *91*

MAIN LEADER: *DR. MARCELLO GIROLETTI*

REPORT:

1. Programme of the meeting

The programme of the meeting is attached as Annex 1.

2. Scientific Summary

The great observational contributions delivered by Fermi-LAT and the Very High Energy observatories (MAGIC, HESS, VERITAS) have triggered a renewed interest in many extreme astrophysical processes: launch, collimation, structure of relativistic jets; acceleration of particles in the vicinity of supermassive black holes; disk-jet connection; populations contributing to the extragalactic gamma-ray background; opacity of the universe; and so on.

The Italian extragalactic community has organized biennial meetings in Bologna since 2010, led by the various groups with expertise in radio and high energy emission (groups in Bologna, Milan, Rome, Perugia, and more). These meetings have been very fruitful in fostering interaction between these different communities, and the 2014 Bologna High Energy Meeting (Boheme) meeting took place as usual two years after the previous one (for Boheme 2012, please see <https://hangar.iasfbo.inaf.it/fermi-eng/>). For the first time, the meeting was extended beyond the traditional topics of relativistic jets and their non thermal electromagnetic emission. We included contributions dealing with “the other half of the sky”, touching topics like dark matter and galactic sources such as pulsars, supernova remnants, ultra-luminous X-ray sources; we also moved on from the traditional multi-wavelength to a multi-messenger approach, with contributions about neutrino astrophysics and cosmic rays.

In details, we had three main sessions, each one divided in sub-sessions which were interleaved so to foster interaction and mutual interest among the various groups and communities: *Jets under different viewing angles*; *The other half of the sky*; *Future Missions*. We also allocated four ample slots for open discussions. We had many important contributions reporting the recent results from the all-sky gamma-ray survey by Fermi, giving a preview of the third Fermi catalog (3FGL) and of the companion catalogue of LAT Active Galactic Nuclei (3LAC). Dedicated talks based on gamma-ray spectral analysis, on multi-frequency light curves, and on Very Long Baseline Interferometry observations in the radio band covered the very hot topic of the location of the high energy emission zone. We had reports on the first gamma-ray flare of a gravitationally lensed blazar, on the growing population of misaligned gamma-ray AGNs (radio galaxies), on recent findings about the origin of cosmic rays, and on the physics and structure of pulsars. Finally, a rich session on future instrumentation from the radio (SKA, ALMA) to the highest energies (CTA) provided the basis for future developments in this field.

The number of participants exceeded our most optimistic expectations, increasing by >30 units those attending the previous edition. The fraction of the participants and of the speakers of young age and/or of female gender was quite large. In particular, the share of women was near (or exceeding) 40% in the participant list, the speakers, and the organizing committee. Many Ph.D. students and junior post-docs participated with oral talks, and some local undergraduate students contributed poster presentations. Most participants were based in Italy; however, the meeting had an International scope as all the presentations were in English, some participants

came from abroad (Germany) and some more are foreign post-docs currently working in Italy. Many presentations were submitted on behalf of the International Fermi LAT collaboration.

3. Attendance list

The attendance list is attached as annex 2. Since it was unpractical to collect signatures from each of the participants, it is signed and confirmed by the organizer.

4. Financial Report / RadioNet3 contribution

The financial contribution from RadioNet3 (€1000) was used to partially support the cost of the conference room and of the coffee breaks offered to the participants.

5. Conference Proceedings and Web page

The meeting was meant to be informal so there will be no official proceedings, although many publications will stem from the research topics discussed at the meeting. We do plan to make the presentation available in electronic format; we have collected the contributions and they will be linked from the web page. The web page itself will remain available on the internet at the following URL: <https://hangar.iasfbo.inaf.it/boheme/>.

Annex 1: Programme

Monday 7th April

14.00-14.30 Registration

14.30-14.45 Welcome (M. Giroletti for LOC; M. Capaccioli for INAF)

Catalogues (chair: F. D'Ammando)

14.45-15.10 Fermi-LAT results and future prospects (L. Latronico)

15.10-15.35 The third catalog of AGN detected by the Fermi-LAT (S. Cutini)

15.35-16.00 Unidentified gamma-ray sources (G. Tosti)

16.00-16.20 The third Fermi-LAT catalog of high-energy gamma-ray sources (E. Cavazzuti)

16.20-16.40 Coffee Break

Jets under different viewing angles I (chair: G. Giovannini)

16.40-17.05 The cosmic evolution of Fermi BL Lac objects (D. Gasparrini)

17.05-17.30 Big and young SMBHs in the early Universe (T. Sbarrato)

17.30-17.50 Hard times for FSRQ (L. Pacciani)

17.50-18.10 MW behavior of blazar OJ 248 from radio to gamma-rays (M.I. Carnerero Martin)

18.10-18.30 Discussion

Tuesday 8th April

The other half of the sky I (chair: P. Padovani)

09.30-09.55 On the origin of Galactic cosmic rays (E. Amato)

09.55-10.20 Ultra high-energy neutrinos and AGNs (F. Tavecchio)

10.20-10.40 On the arrival directions of cosmic rays detected by the Pierre Auger Observatory (R. Bonino)

10.40-11.00 On the MHD modeling of the Crab nebula radio emission (B. Olmi)

11.00-11.20 Coffee Break

Jets under different viewing angles II (chair: M. Orienti)

11.20-11.45 Highest Energy Sources (L. Costamante)

11.45-12.10 Misaligned AGNs (P. Grandi/E. Torresi)

12.10-12.30 A strong radio brightening at the jet base of M87 during the elevated VHE gamma-ray state in 2012 (K. Hada)

12.30-12.50 Lensed gamma-ray blazars: the case of PKS 1830-211 (S. Ciprini)

12.50-13.10 Jets in ULXs? (A. Wolter)

13.10-14.15 Lunch

Jets under different viewing angles III (chair: L. Maraschi)

14.15-14.40 Radio/Gamma connection (M. Orienti)

14.40-15.00 Gamma-ray and Very Long Baseline Polarimetry connection in Mrk421 during the broadband campaign in 2011 (R. Lico)

15.00-15.20 Multi-frequency and time domain studies of blazars (P. Giommi)

15.20-15.40 An IR-based sample of ~1000 VHE gamma-ray blazar candidates (P. Padovani)

15.40-16.00 Discussion

16.00-16.20 Coffee Break

The other half of the sky II (chair: G. Tosti)

16.20-16.45 Fermi-LAT results on SNRs (F. De Palma)

16.45-17.05 Measuring cosmological parameters with GRB: status and perspectives (L. Amati)

17.05-17.25 GRB jets from the gamma to radio view (G. Ghirlanda)

17.25-17.45 X-ray grating observations of novae and supersoft X-ray sources (M. Orio)

17.45-18.15 Discussion

20.30 Social dinner

Wednesday 8th April

The other half of the sky III (chair: R. Cassano)

09.30-09.55 CTA (G. Tosti)

09.55-10.20 Astrophysical clues from (the lack of) gamma-ray emission in galaxy clusters (F. Vazza)

10.20-10.45 High-energy pulsars in the Fermi era (M. Razzano)

10.45-11.05 Multi-wavelength observations of Fermi pulsars (R. Mignani)

11.05-11.25 Coffee Break

Future missions I (chair: L. Feretti)

11.25-11.50 SKA, precursors and pathfinders (M. Giroletti)

11.50-12.15 ALMA: current results and future perspectives for gamma-ray sources (E. Liuzzo)

12.15-12.40 L'esperimento DAMPE (F. Loparco)

12.40-14.00 Lunch

Future missions II (chair: G. Malaguti)

14.00-14.25 GAMMA-400 (I. Donnarumma)

14.25-14.50 The Athena mission (M. Cappi)

14.50-15.15 HORIZON 2020 (G. Giovannini)

15.15-16.15 Summary and closing remarks (G. Ghisellini)

Annex 2: List of Participants

Lorenzo Amati (Inaf-Iasf Bologna)
Elena Amato (Inaf-Osservatorio Astrofisico Di Arcetri)
Elisa Antolini (Universita' Di Perugia)
Vincenzo Antonuccio-Delogu (Inaf-Osservatorio Astrofisico Di Catania)
Natalia Auricchio (Inaf-Iasf Bologna)
Mario Ballardini (Universita' Di Bologna-Difa & Inaf-Iasf Bologna)
Barbara Balmaverde (Universita' Di Firenze)
Loredana Bassani (Inaf-Iasf Bologna)
Marco Berton (Universita' Di Padova)
Elisabetta Bissaldi (Universita' & Infn Trieste)
Marco Bondi (Inaf-Ira Bologna)
Raffaella Bonino (Infn Torino)
Gianfranco Brunetti (Inaf-Ira Bologna)
Carlo Burigana (Inaf-Iasf Bologna)
Alessandro Caccianiga (Inaf-Osservatorio Astronomico Di Brera)
Riccardo Campana (Inaf-Iasf Bologna)
Massimo Capaccioli (Universita' Degli Studi Di Napoli Federico II- Dip. Di Fisica)
Alessandro Capetti (Inaf-Osservatorio Astrofisico Di Torino)
Massimo Cappi (Inaf-Iasf Bologna)
Maria Isabel Carnerero Martin (Inaf-Osservatorio Astrofisico Di Torino)
Ezio Caroli (Inaf-Iasf Bologna)
Rossella Cassano (Inaf-Ira Bologna)
Elisabetta Cavazzuti (Agenzia Spaziale Italiana)
Pietro Leonardo Cerchiara (Universita' Di Udine-Dcfa)
Stefano Ciprini (Asi/Asdc & Inaf-Osservatorio Astronomico Di Roma)
Luigi Costamante (Universita' Di Perugia)
Sara Cutini (Asdc/Inaf)
Mauro Dadina (Inaf-Iasf Bologna)
Daniele Dallacasa (Universita' Di Bologna-Difa)
Filippo D'Ammando (Inaf-Ira Bologna)
Francesco De Palma (Infn Bari E Universita' Telematica Pegaso)
Melania Del Santo (Inaf-Iasf Roma)
Stefano Etori (Inaf-Osservatorio Astronomico Di Bologna)
Luigina Feretti (Inaf-Ira Bologna)
Attilio Ferrari (Universita' Di Torino)
Davide Fierro (Inaf)
Valentina Fioretti (Inaf-Iasf Bologna)
Luigi Foschini (Inaf-Osservatorio Astronomico Di Brera)
Dario Gasparrini (Asi/Asdc & Inaf-Osservatorio Astronomico Di Roma)
Giancarlo Ghirlanda (Inaf-Osservatorio Astronomico Di Brera)
Gabriele Ghisellini (Inaf-Osservatorio Astronomico Di Brera)
Isabella Maria Gioia (Inaf-Ira Bologna)
Paolo Giommi (Asi-Asdc)
Gabriele Giovannini (Inaf-Ira Bologna, Universita' Di Bologna-Difa)
Marcello Giroletti (Inaf-Ira Bologna)
Myriam Gitti (Universita' Di Bologna-Difa)
Paola Grandi (Inaf-Iasf Bologna)
Daria Guidetti (Inaf-Ira Bologna)
Kazuhiro Hada (Inaf-Ira Bologna/Naoj)
Pierpaola Ippoliti (Inaf-Ira Bologna)

Rocco Lico (Inaf-Ira Bologna, Universita' Di Bologna-Difa)
Elisabetta Liuzzo (Inaf-Ira Bologna)
Francesco Loparco (Infn Bari)
Alessandro Maini (Inaf-Ira Bologna)
Elisabetta Maiorano (Inaf-Iasf Bologna)
Giuseppe Malaguti (Inaf-Iasf Bologna)
Angela Malizia (Inaf-Iasf Bologna)
Laura Maraschi (Inaf-Osservatorio Astronomico Di Brera)
Martino Marisaldi (Inaf-Iasf Bologna)
Roberto Mignani (Inaf-Iasf Milano)
Jader Monari (Inaf-Ira Bologna)
Barbara Olmi (Universita' Degli Studi Di Firenze)
Monica Orienti (Inaf-Ira Bologna)
Marina Orio (Inaf-Padova)
Luigi Pacciani (Inaf-Iaps Roma)
Paolo Padovani (Eso)
Paola Parma (Inaf-Ira Bologna)
Michele Perna (Universita' Di Bologna-Difa)
Serena Perrotta (Sissa)
Graziella Pizzichini (Inaf-Iasf Bologna)
Massimiliano Razzano (Universita' Di Pisa & Infn-Pisa)
Andrea Rossi (Inaf-Iasf Bologna)
Tullia Sbarrato (Eso)
Alessandra Scaffidi (Inaf)
Vito Sguera (Inaf-Iasf Bologna)
Cristiana Spingola (Universita' Di Bologna)
Carlo Stanghellini (Inaf-Ira Bologna)
Bruno Sversut Arsioli (Universita' La Sapienza Roma)
Fabrizio Tavecchio (Inaf-Osservatorio Astronomico Di Brera)
Eleonora Torresi (Inaf-Iasf Bologna)
Gino Tosti (Universita' Di Perugia, Infn)
Tiziana Trombetti (Inaf-Iasf Bologna)
Grazia Umama (Inaf-Osservatorio Astrofisico Di Catania)
Franco Vazza (Hamburg Observatory)
Tiziana Venturi (Inaf-Ira Bologna)
Cristian Vignali (Universita' Di Bologna-Difa)
Anna Wolter (Inaf-Osservatorio Astronomico Di Brera)
Gianni Zamorani (Inaf-Osservatorio Astronomico Di Bologna)
Luca Zampieri (Inaf-Osservatorio Astronomico Di Padova)
Polina Zemko (Dipartimento Di Fisica E Astronomia Università Di Padova)

A handwritten signature in blue ink, appearing to read "Marco Fini".