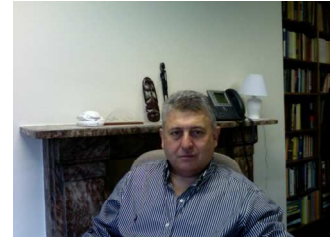


Aharonian Felix

Position: Professor of Astrophysics, Dublin Institute for
Advanced Studies,
and
Leader of High Energy Astrophysics Group
Max-Planck-Institut für Kernphysik



Period covered: Professor of Astrophysics since 2006 – present
Leader of High Energy Astrophysics Group since 1993-present

I Scientific Work

- Radiation Processes in Thermal and Non-thermal Relativistic Plasmas
- Physics and Astrophysics of Relativistic Outflows
(*Pulsar Winds, Jets in Microquasars, AGN, GRBs*)
- Origin of Galactic Cosmic Rays and related topics
(*X- and γ -radiation from Supernova Remnants, Diffuse radiation of the Galactic Disk*)
- Sources of Highest Energy Cosmic Rays and related topics
(*Radiogalaxies, Clusters of Galaxies, Large Scale Intergalactic Shocks*)
- Observational Cosmology
(*Diffuse Extragalactic Radiation, Magnetic Fields, Dark Matter*)
- Astrophysical Sources of High Energy Neutrinos
- Detection techniques of cosmic gamma-rays and neutrinos

II Conferences and educational activities

2006: **Convener** of three sessions on “Astrparticle Physics”, “Gamma Ray Astronomy” and “Neutrino Astronomy” during the XXIII Symposium on Relativistic Astrophysics, Melbourne, Australia, December 2006

2007: **Chair of SOC** of the International workshop “High Energy Phenomena in Relativistic Outflows”, Dublin, September 2007

2008: **Chair of SOC** of the 4th International Symposium on “High Energy Gamma Ray Astrophysics”, Heidelberg July 2008

member of Scientific Organizing Committees (SOC) of international meetings: *"The variable gamma-ray sources: their identifications and counterparts"* (Elba Island, Italy, June 2006); *"Challenges of Relativistic Jets"* (Cracow, Poland, June 2006); *"The Multi-Messenger Approach to High-Energy Gamma-Ray Sources"* (Barcelona, Spain, July 2006); *"The light of the dark: solving the mysteries of the Universe"* (Villa Mondragone, Frascati, Italy, June 2007); *RICAP'07: Roma International Conference on Astro-Particle physics* (Roma, Italy, June 2007); *"High-Energy Astrophysics: the keV-TeV connections"*, JENAM 2007 Symposium No. 4 (Yerevan, Armenia, August 2007); *"TeV Particle Astrophysics III"* (Venice, Italy, August 2007), *"Non-Thermal Hadronic Processes in Galactic Sources"* (Heidelberg, January 2008), *"High-Energy Acceleration Processes in Supernova Remnants, PWNe, MicroBlazars and Binaries: the keV to TeV Connection"* and *"Astrophysical Studies of Neutron Stars from Multi-wavelength Observations"* (both symposia during the 37th COSPAR Scientific Assembly, Montreal, Canada, July 2008), International Workshop *"TeV Particle Astrophysics IV"* (Beijing, China, September 2008), Workshop *"Science with the New Generation of High Energy Gamma-Ray Experiments"*, Padova, Italy, September 2008, ASPEN Winter Conference on *"Thirty Years of Magnetars: New Frontiers"*, Aspen, USA, February 2009, International workshop on *"High Energy Phenomena in Relativistic Outflows II"*, Buenos Aires, Argentina, October 2009.

- University College Dublin (2007), lectures on "Introduction to Gamma Ray Astronomy"
- Trinity College Dublin (2008), lectures on Radiation processes in High Energy Astrophysics
- First La Plata International School on Astronomy (Argentina, 2008), lectures on High energy processes in relativistic Outflows
- The International Relativistic Astrophysics PhD School (Rome/Pescara, 2008-2009), lectures on Selected topics of X and Gamma -ray Astronomies
- Supervisor of a Alexander von Humboldt postdoctorial fellow (MPIK, Heidelberg)
- Supervisor of two Marie Curie postdoctorial fellows (DIAS, Dublin, and MPIK, Heidelberg)
- Supervisor of two LEA postdoctorial fellows (MPIK, Heidelberg)
- Supervisor of a Schroedinger postdoctorial fellow, DIAS, Dublin
- Supervisor of an ERGSET postdoctorial fellow (DIAS, Dublin)
- Supervisor of two PhD students (G. Vannoni and O. Zacharopoulou) International Max Planck Research School at University of Heidelberg (Germany)
- Supervisor of three PhD students: L. Fallon (Trinity College Dublin), S. Delaney and D.Malishev (University College Dublin)
- Chair of the PhD theses defense Committee (University of Barcelona)
- Member of the PhD theses defense Committee (Oxford University)

III 2007-2008 List of Publications

F.A. Aharonian, J. Buckley, T. Kifune, G. Sinnis "High energy astrophysics with ground based gamma ray detectors", Reports on Progress in Physics, 2008, vol. 71, p. 096901 (2008)

F.A. Aharonian, "Motivations and Objectives of Gamma Ray Astronomy", Physics Reports, in preparation

F.A. Aharonian, W. Hofmann, S. Ritz "High-Energy Gamma-Ray Astronomy", Annual Review of Nuclear and Particle Science, in preparation

F.A. Aharonian, "The Very-High-Energy Gamma Ray Sky", Science, 2007, vol. 315, p.70
F.A. Aharonian, "High Energy Astrophysics", invited article for the UNESCO Encyclopedia, in press

F. A. Aharonian and S.R. Kelner "Radiation Processes in High Energy Astrophysics" , Oxford University Press, in preparation (to be submitted before December 2008)

F. A. Aharonian "Very high energy cosmic gamma radiation : a crucial window on the extreme Universe", World Scientific Publishing, second edition, to be submitted before August 2009

F.A. Aharonian, F. Rieger (editors): "High Energy Phenomena in Relativistic Outflows ", International Journal of Modern Physics, World Scientific, 2008, in press

F.A. Aharonian, W. Hofmann, F. Rieger (editors): "High Energy Gamma Ray Astronomy-3", AIP Conf. Proc., New York, 2009, in preparation

F.A. Aharonian "Galactic Sources of High Energy Neutrinos", J.Phys.G: Nucl. Part. Phys., 2008, in press

D.V. Khangulyan, F.A. Aharonian, F. A., S.V. Bogovalov, A.V. Koldoba, G.V. Ustyugova "Hydrodynamics of interaction of pulsar and stellar winds and its impact on the high energy radiation of binary pulsar systems" Intern. Journal of Modern Physics D, in press

V. Bosch-Ramon, D. Khangulyan, F.A. Aharonian "The magnetic field and the location of the TeV emitter in Cygnus, X-1 and LS, 5039, Astron. Astrophys., 2008, vol. 489, p. L 21

S.R. Kelner, F.A. Aharonian "Energy distributions of gammarays, electrons and neutrinos produced at interactions of relativistic protons with low energy radiation" Phys. Rev D 2008, vol. 78, id. 34013

T. Tanaka, Y. Uchiyama, F.A. Aharonian, et al. "Study of Nonthermal Emission from SNR RX J1713.7-3946 with Suzaku" Astrophys. J 2008, vol. 685, p. 988

S. Gabici, A. Taylor, R. White, S. Casanova, F. Aharonian " The diffuse neutrino ux from

the inner Galaxy: constraints from very high energy gamma-ray observations
Astroparticle Physics, in press

L. O' C. Drury, F.A. Aharonian The puzzling MILAGRO hot spots Astroparticle Physics
2008,, vol. 29, p. 420

F. A. Aharonian, D. Khangulyan, L. Costamante "Formation of hard very high energy
gamma-ray spectra of blazars due to internal photon-photon absorption" Mon. Not. of
Royal Astron. Soc. 2008, vol. 387, p. 1206

Y. Uchiyama, F.A. Aharonian "Fast variability of X-ray compact hot spots in Cas A"
Astrophys. J 2008, vol. 677, p. L105

S.V. Bogovalov, D. Khangulyan, A.V. Koldoba, G.V. Ustyugova, F. Aharonian "Modeling
interaction of relativistic and nonrelativistic winds in binary system PSR 1259-63/SS2883.
I.Hydrodynamical limit" Mon. Not. of Royal Astron. Soc. 2008, vol. 387, p. 63

V. Bosch-Ramon, D. Khangulyan, F. Aharonian "Non-thermal emission from secondary
pairs in close TeV binary systems" Astron. Astrophys., 2008, vol. 482, p.397

F.M. Rieger, F.A. Aharonian "Variable VHE gamma-ray emission from non-blazar AGNs"
Astron. Astrophys., 2008, vol. 479, p. L5

D. Khangulyan, F. Aharonian, V. Bosch-Ramon "On the formation of TeV radiation in LS
5039" Mon. Not. of Royal Astron. Soc. 2007, vol. 383, p. 467

Y. Uchiyama, F. Aharonian, T. Takahashi, T. Tanaka, Y. Maeda "Witnessing shock
acceleration of cosmic rays in real time" Nature, 2007, vol. 449, p. 576

D. Khangulyan, S. Hnatic, F.A. Aharonian, S. Bogovalov "TeV lightcurve of PSR B1259-
63/SS2883" Mon. Not. of Royal Astron. Soc. 2007, vol. 380, p. 320

A. Neronov, F.A. Aharonian, "Production of TeV gamma-radiation in the vicinity of the
supermassive black hole in the giant radiogalaxy M87", Astrophys. J, 2007, vol. 671, p. 85

S. Gabici, F.A. Aharonian " Searching for galactic cosmic ray PeVatrons with multi-TeV
gamma rays and neutrinos ApJ. Letters, 2007, vol. 665, p. L131

S. Gabici, F.A. Aharonian "Gamma ray signatures of ultra high energy cosmic ray
accelerators: electromagnetic cascade versus synchrotron radiation of secondary
electrons" Astrophys. Space Sci., 2007, vol. 309, p. 365

D. Khangulyan, S. Hnatic, F.A. Aharonian "Modulation of the high energy gamma-ray ux
from PSR B1259-63/SS2883 due to the orbital variation of the maximum energy of
accelerated electrons" Astrophys. Space Sci., 2007, vol. 309, p.261

S. Funk, J.A. Hinton, Y. Moriguchi, F.A. Aharonian "XMM-Newton observations of HESS

J1813-178 reveal a composite supernova remnant" *Astron. Astrophys.*, 2007, vol. 470, p.249

S. Gabici, F.A. Aharonian, P. Blasi "Gamma Rays from molecular clouds" *Astrophys. Space Sci.* 2007, vol. 309, p. 365 D. Horns, A.I.D. Hoffmann, F.A. Aharonian, G.P. Rowell, A. Santangelo "XMM-Newton observations of the first unidentified TeV gamma-ray source TeV J2032+4130" *Astron. Astrophys.*, 2007, vol. 469, p.L17

S. Funk, J.A. Hinton, G. Pühlhofer, F. Aharonian, W. Hofmann, O. Reimer, S. Wagner "XMM-Newton observations reveal the X-ray counterpart of the very-high-energy gamma-ray source HESSJ1640-465" *Astrophys.J.*, 2007, vol. 662, p. 517

V.N. Zirakashvili, F.A. Aharonian "Analytical solutions for energy spectra of electrons accelerated by nonrelativistic shock-waves in shell type supernova remnants" *Astron. Astrophys.*, 2007, vol. 465, p. 695

A. Kappes, J. Hinton, Ch. Stegmann, F.A. Aharonian "Potential Neutrino Signals from Galactic Gamma-Ray Sources" *Astrophys. J.*, 2007, vol. 656, p. 870

E.V. Derishev, F.A. Aharonian, V.V. Kocharovsky "Off-axis emission from relativistic plasma flows" *Astrophys. J.*, 2007, vol. 655, p. 980

J. Hinton, F.A. Aharonian "Inverse Compton Scenarios for the TeV Gamma-Ray Emission of the Galactic Center" *Astrophys. J.*, 2007, vol. 657, p. 302

S.A. Yost, F.A. Aharonian, C.W. Akerlof et al. "The Dark Side of ROTSE-III Prompt GRB Observations" *Astrophys. J.*, 2007, vol. 669, p.1107

A.E Ruiz-Velasco, ... F.A. Aharonian, ... W.K. Zheng "Detection of GRB 060927 at $z = 5.47$: Implications for the Use of Gamma-Ray Bursts as Probes of the End of the Dark Ages" *Astrophys. J.*, 2007, vol. 669, p.1

S.A Yost, H.F. Swan E. S. Ryko_, F.A. Aharonian, C.W. Akerlof et al., "Exploring broadband GRB behavior during gamma-ray emission" *ApJ Letters*, 2007, vol. 657, pp. 925