

## Aharonian Felix A.

Positions: Professor  
and  
Head of the Astroparticle Physics Group  
Dublin Institute for Advanced Studies  
and  
Head of High Energy Astroph. Theory Group,  
Max-Planck-Institut fuer Kernphysik,  
Heidelberg, Germany



Fields of Research: High Energy Astrophysics, Astroparticle Physics, Cosmology

### I Scientific Work

#### *Involvement in major Projects:*

Member (representative of ESA) of the Science Working Group of the JAXA-NASA X-ray mission ASTRO-H (X-ray Astronomy)  
Member of the H.E.S.S. Collaboration Board (gamma-ray astronomy)  
Member of the KM3NeT Consortium Board (neutrino astronomy)  
Co-PI of the ROTSE network of optical telescopes (GRB afterglows)

#### *Panels, Committees, Schools*

Co-director of LEA - European Associated Laboratory on High Energy Astrophysics jointly supported by CNRS (France) and MPG (Germany)  
Scientific Advisor of the High Energy Astrophysics Laboratory, Yerevan, Armenia  
Adjunct Professor, School of Physics, University College Dublin (USD)  
Adjunct Professor and member of the International Center for Relativistic Astrophysics, Rome/Pescara, Italy  
Member ("Supervisor") of the Heidelberg Graduate School of Fundamental Physics,  
Member of the International Review Board of the Helmholtz Association  
Member of the European ASTRONET Infrastructure Roadmap Panel A:  
"High energy astrophysics, astro-particle physics and gravitational waves"  
Editor of the International Journal of Modern Physics D

#### *PostDocs and Students (2008-2009)*

- three MPG postdoctoral fellows (MPIK/Heidelberg)
- Alexander von Humboldt fellow (MPIK/Heidelberg)
- three Marie Curie postdoctoral fellows (DIAS/Dublin, and MPIK/Heidelberg)
- two LEA postdoctoral fellows (MPIK/Heidelberg)
- two Schroedinger postdoctoral fellows (DIAS, Dublin)
- an IRCSET postdoctoral fellow (DIAS, Dublin)
- three PhD student in Heidelberg and three PhD students in Dublin

#### *Lectures:*

High Energy Phenomena on Galactic and Extragalactic Scales,  
Nagoya University Winter School, Japan, February 2009

Gamma Ray Astronomy

DPG School on Astroparticle Physics, Bad Honnef, Germany, Sep 2009

Frontiers in High Energy Astrophysics,  
27th Jerusalem Winter School in Theoretical Physics, Jerusalem, Israel, Dec 2009

*Organization of International Workshops, Symposia, Conferences (2009)*

2009: Co-Chair of OC of the International workshop on High Energy Gamma Rays and Neutrinos from Extragalactic sources, Heidelberg, January 2009

Convener of the Session on “Gamma Rays from AGN”, 12th Marcel Grossmann Meeting on Relativistic Astrophysics, Paris, France, July 2009

Convener of the Session on “Neutrino Sources”, 4<sup>th</sup> VLVT workshop, Athens, October, 2009

*Member of Scientific Organizing Committees of meetings (2009):*

Thirty Years of Magnetars: New Frontiers (Aspen, USA, Feb 2009)

International Conference in honor of Ya. B. Zeldovich 95th anniversary (Minsk, Belarus, April 2009)

RICAP'09: Roma International Conference on Astroparticle Physics (Villa Mondragone, Frascati, Italy, May 2009)

Testing Astroparticle with New GeV/TeV observations (Paris, France, May 2009)

TeV Particle Astrophysics V (Stanford University, USA, Aug 2008)

The Extreme sky: Sampling the Universe above 10 keV (Otranto, Italy, Oct 2009)

High Energy Phenomena in Relativistic Outflows II (Buenos Aires, Argentina, Oct 2009)

## **2009 List of Publications**

(approximately 300 papers in peer review journals - see <http://www.mpi-hd.mpg.de/astrophysik/HEA/1024.html>)

M. Chernyakova, A. Neronov, F. Aharonian, Y. Uchiyama, T. Takahashi: X-ray observations of PSR B1259-63 near the 2007 periastron passage *Mon. Not. of Royal Astron. Soc.*, 2009, vol. 397, pp. 2123-2132

Y. Fukui, N. Furukawa, T. M. Dame, J. Dawson, H. Yamamoto, G. Rowell, F. Aharonian, W. Hofmann, E. de Ona Wilhelmi, T. Minamidani, A. Kawamura, N. Mizuno, T. Onishi, A. Mizuno, S. Nagataki: A Peculiar Jet and Arc of Molecular Gas toward the Rich and Young Stellar Cluster Westerlund 2 and a TeV Gamma Ray Source. *PASJ*, 2009, vol.61, pp. L23-L26

S. Gabici, F. Aharonian, S. Casanova: Broad-band non-thermal emission from Molecular clouds illuminated by cosmic rays from nearby supernova remnants *Mon. Not. of Royal Astron. Soc.*, 2009, vol. 396, pp. 1629-1639

T. Takahashi, T. Kishishita, Y. Uchiyama, T. Tanaka, K. Yamaoka, D. Khangulyan, F. Aharonian, V. Bosch-Ramon, J. Hinton: Study of the Spectral and Temporal Characteristics of X-Ray Emission of the Gamma-Ray Binary LS 5039 with Suzaku. *Astrophys. J* 2009, vol. 697, pp. 592-600

A. Taylor, F.A. Aharonian: The Spectral Shape and Photon Fraction as Signatures of the GZK-

Cutoff. *Phys. Rev D*, 2009, vol. 79, id. 083010

A. Taylor, S. Gabici, R. White, S. Casanova, F. Aharonian: Revisiting the diffuse neutrino flux from the inner Galaxy using new constraints from very high energy gamma-ray observations. *Nucl. Inst. and Methods in Phys. Research*, 2009, vol. 602, pp. 113-116

G. Vannoni, S. Gabici, S.; F.A. Aharonia: Diffusive shock acceleration in radiation-dominated environments, *Astron. Astrophys.*, 2009, vol. 497, pp.17-26

L. O'C. Drury, F.A. Aharonian, D. Malyshev, S. Gabici: On the plasma temperature in supernova remnants with cosmic-ray modified shocks, *Astron. Astrophys.*, 2009, vol. 496, pp.1-6

J.A. Hinton, J.L. Skilton, S. Funk, J. Brucker, F.A. Aharonian, G. Dubus, A. Fiasson, Y. Gallant, W. Hofmann, A. Marcowith: HESS J0632+057: A New Gamma-Ray Binary? *Astrophys. J.*, 2009, vol. 690, pp. L101-L104

A. Eungwanichayapant, F. Aharonian: Very High Energy Gamma Rays from electron-positron Pair Halos. *International Journal of Modern Physics D*, 2009, vol. 18, pp. 911- 927

*HESS collaboration papers: F.A. Aharonian et al.*

Spectrum and variability of the Galactic center VHE gamma-ray source HESS J1745-290. *Astron. Astrophys.*, 2009, vol. 503, pp.817-825

Simultaneous multiwavelength observations of the second exceptional gamma-Ray flare of PKS 2155-304 in July 2006. *Astron. Astrophys.*, 2009, vol. 502, pp.749-770 502

Constraints on the multi-TeV particle population in the Coma galaxy cluster with HESS observations. *Astron. Astrophys.*, 2009, vol. 502, 437-443

Detection of very high energy radiation from HESS J1908+063 confirms the Milagro unidentified source MGRO J1908+06. *Astron. Astrophys.*, 2009, vol. 499, 723-728.

Simultaneous Observations of PKS 2155304 with HESS, Fermi, RXTE, and Atom: Spectral Energy Distributions and Variability in a Low State *Astrophys.J.*, 2009, vol. 696, L150-L155

Upper limit on the very high energy -ray emission from the globular cluster 47 Tucanae. *Astron. Astrophys.*, 2009, vol. 499, 273-277

Discovery of Very High Energy Gamma-Ray Emission from Centaurus a with H.E.S.S. *Astrophys. J.*, 2009, vol. 695, L40-L44

Discovery of Gamma-Ray Emission From the Shell-Type Supernova Remnant RCW 86 with HESS. *Astrophys.J.*, 2009, vol. 692, 1500-1505

HESS observations of gamma-ray bursts in 2003-2007. *Astron. Astrophys.*, 2009, vol. 495, 505-512

Very high energy gamma-ray observations of the galaxy clusters Abell 496 and Abell 85 with HESS. *Astron. and Astrophys.*, 2009, vol. 495, 27-35

A Search for a Dark Matter Annihilation Signal Toward the Canis Major with HESS. *Astrophys.J.*,

2009, vol. 691, 175-181

HESS Observations of the Prompt and Afterglow Phases of GRB 060602B *Astrophys. J.*, 2009, vol. 690, 1068-1073

F.A. Aharonian, "Motivations and Objectives of VHE Gamma Ray Astronomy",  
Physics Reports, to be submitted

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

*Recent articles for broad audience:*

F.A. Aharonian, "The Very-High-Energy Gamma Ray Sky", *Science*, 2007, 315, 70

F.A. Aharonian, "High Energy Astrophysics", UNESCO Encyclopedia, 2009

F.A. Aharonian and M. Chernyakova "Gamma Asronomiya" (in Russian) *Zemlya i Vselennaya*,  
March 2009

*Books:*

F. A. Aharonian and S.R. Kelner "Radiation Processes in High Energy Astrophysics", Oxford  
University Press, in preparation

F. A. Aharonian "Very high energy cosmic gamma radiation : a crucial window on the extreme  
Universe", World Scientific Publishing, second edition, in preparation

*Conference Proceedings:*

F.A. Aharonian, W. Hofmann, F. Rieger (editors): "High Energy Gamma Ray Astronomy-3", AIP Conf.  
Proc. 1085, Melville, New York, 2009

E. Resconi, F.A. Aharonian (editors): "'High-Energy Neutrinos from Extragalactic sources",  
*International Journal of Modern Physics*, in preparation