

# Aous Abdo, Ph.D.

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## EDUCATION

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**Michigan State University**, East Lansing, Michigan USA.  
**Ph.D., Physics, May 2007**

- Dissertation: "Discovery of localized TeV gamma-ray sources and diffuse TeV gamma-ray emission from the Galactic plane with Milagro using a new background rejection technique"
- Winner of the Sherwood K. Haynes Graduate Physics Award for the Outstanding Ph.D. Student in Physics and Astronomy
- Advisors: Prof. James T. Linnemann. & Dr. Gus Sinnis

**M.S., Physics, December 2003**

**University of Jordan**, Amman, Jordan.  
**B.S. in Physics (with honors), January 2000**

## PROFESSIONAL EMPLOYMENT

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**Research Assistant Professor** October, 2010 - present  
Center for Earth Observing and Space Research  
George Mason University, Fairfax Virginia.

**NRC Postdoctoral Research Associate** September, 2007 - October 2010  
Naval Research Laboratory  
Washington DC, USA.

**Postdoctoral Research Scientist** May, 2007 - September, 2007  
Department of Physics, University of Maryland  
College Park Maryland, USA

**Graduate Student in High energy  $\gamma$ -Ray Astrophysics** 2003 - 2007  
Los Alamos National Laboratory, Los Alamos New Mexico &  
Department of Physics and Astronomy  
Michigan State University, East Lansing Michigan.

## GRANTS & EXTERNAL FUNDING

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- 2010** NASA's *Fermi* Cycle III Guest Investigator Program Grant. \$77,972  
**Multi-wavelength Campaign for the Study of the PSR B1259-62/SS 2883 BE Star Binary System**  
*Principal investigator*
- 2010** NASA's *Fermi* Cycle III Guest Investigator Program Grant. \$80,000  
**Continued Gamma-Ray Pulsar Timing with Fermi**  
*Co-investigator*
- 2010** NASA's *Chandra* Cycle 12 \$39,452  
**Searching New Millisecond Pulsar Fields for X-Ray Counterparts**  
*Co-Investigator*
- 2010** NASA's *Chandra* Cycle 12 \$44,729  
**A Search for X-Rays From Pulsars Discovered by Fermi**  
*Co-Investigator*
- 2009** NASA's *XMM-Newton* Guest Observer Program, Cycle 8 \$64,273  
**XMM-Newton Observations of Unidentified High Latitude Femi Sources**  
*Co-Investigator*
- 2007** NRC Postdoctoral Research Associate Award \$110,000/year  
(2007 - 2010)
- 2007** AAS international travel grant \$2000
- 2006** Ettore Majorana Center for Scientific Culture international travel grant \$3000

## HONORS - AWARDS

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- 2009** National Research Council Postdoctoral Research Publication Award - Naval Research Laboratory
- 2007** Sherwood K. Haynes Graduate Physics Award for the Outstanding PhD. Student in Physics and Astronomy - Michigan State University
- 2000** Saqer El Maani Award For The Outstanding Scientific Achievement in physics - University of Jordan.
- 2000** The Housing Bank Award For The Outstanding Scientific Achievement In Natural Sciences - University of Jordan.

## COMPUTER SKILLS

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- Statistical computing environments: ROOT, NumPy, SciPy, PyLab.
- Programming Languages: Extensive use of Python, C++, C, some use of Unix shell scripts and Perl.
- Operating Systems: Linux, UNIX, Mac OS
- Applications: L<sup>A</sup>T<sub>E</sub>X, LyX, common Windows database, spreadsheet, and presentation software,

## SERVICES/LEADERSHIP

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- Reviewer for the NASA Postdoctoral Program
- Helped organize two international workshops on Fermi data analysis:
  - **High Energy Astrophysics in the Fermi Era** held in Guadalajara, Mexico
  - **Exploring the Gamma-Ray Universe with Fermi** held in Cairo, Egypt.
- Referee for the Astrophysical Journal
- Referee for the Astronomy and Astrophysics Journal

## CONFERENCE PRESENTATIONS

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- 2011 MW Observations of the Binary System PSR B1259-63 During the 2010 Periastron Passage**  
217th American Astronomical Society Meeting. Seattle WA.
- 2010 PSR J1907+0602, A Gamma-Ray Pulsar Powering A Bright TeV Pulsar Wind Nebula**  
215th American Astronomical Society Meeting. Washington DC.
- 2009 PSR J1907+0602, A Gamma-Ray Pulsar Powering A Bright TeV Pulsar Wind Nebula**  
The 2009 Fermi Symposium. Washington DC.
- Discoveries of Gamma-ray Pulsars with the *Fermi* Gamma-Ray Space Telescope**  
Frontiers of Space Astrophysics: Neutron Stars & Gamma Ray Bursts Recent Developments & Future Directions Conference. Cairo Egypt.
- 2008 Observations of the Supernova Remnant CTA1 Using the LAT on the Fermi Gamma-ray Space Telescope**  
24th Texas Symposium on Relativistic Astrophysics. Vancouver Canada

**2007 Surveying the Galaxy At 20 TeV with Milagro**  
NASA Goddard Space Flight Center Greenbelt, MD.

**Discovery of Localized TeV Gamma-Ray Sources in the Galactic Plane with Milagro**

30th International Cosmic-Ray Conference. Merida, Yucatan. Mexico

**Discovery of TeV Gamma-Ray Emission from the Cygnus Region with Milagro**

American Physical Society Meeting. Jacksonville, Florida.

**Discovery of TeV Gamma-Ray Emission from the Galactic Plane with Milagro Using a new Background Rejection Technique**  
**Plenary-session contributed talk**

The First GLAST Science Symposium. Stanford University, Stanford, California.

**2006 Discovery of TeV Gamma Rays from the Cygnus Region of the Galaxy with Milagro.**

High Energy Astrophysics Division Conference. San Francisco California.

**Detection of TeV Gamma Rays from the Cygnus Region with Milagro.**

Towards The Future: Ground-Based Gamma-Ray Astronomy. Santa Fe, New Mexico.

**Milagro, A Water Cerenkov Calorimeter for TeV Gamma-Ray Astrophysics.**

XII International Conference on Calorimetry in High Energy Physics. Chicago, IL.

## BOOKS

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**2008 Discovery of localized TeV gamma-ray sources and diffuse TeV gamma-ray emission from the Galactic plane with Milagro using a new background rejection technique.** ISBN-13: 978-3836486767

## TEACHING EXPERIENCE & PHILOSOPHY

My experience both as graduate student and as researcher taught me how closely related research and teaching are. When teaching I want to incite in students the feeling of discovery, of curiosity and excitement which I experience daily in my research, thus inducing independent thinking and an un-quenchable interest in Nature. My intention is to inspire the students to ask themselves the type of questions that lead to developing and understanding key physical concepts and the skills of scientific reasoning.

I see learning as an active process which takes place within the individual more than in the lecture hall. To me, it is a process whose difference to discovery in research is mostly the fact that in the latter one learns things which are not yet found in textbooks. The teacher can assist, guide, motivate, trigger and speed up the process. And well-motivated students see the demands of complex subjects rather as a challenge than as a burden.

I believe that knowledge management, i.e. the dissemination of existing knowledge, is the other pillar besides knowledge acquisition, i.e. research, on which a fruitful academic environment is built. This also means that besides the formal knowledge which of course forms the core of any university education, its context and foundations must be made clear to the students. A good lecturer will also support the student, freshman or graduate, to find an own style to effectively and understandably communicate the research results to the peers in academia or in industry, and to the general public.

In my view, good research and good teaching are too interwoven to be separable in higher education. My personal goal is a continuous advance in both.

My teaching experience has been boosted by several years of teaching. I have taught several physics courses at the undergraduate level for different majors; physics, Interdisciplinary, medical and natural sciences. I addressed large classes (teaching assistant at the University of Jordan) and small classes (teaching assistant at Michigan State University). I have also experienced the one-on-one teaching experience by assisting the undergraduates with their own assignments (teaching assistant for the Competence Based Information course at MSU). I have learned from the comments and feedback of my students which helped improve my teaching skills. I tasted the beauty of how different audiences would require different teaching styles.

Courses I taught included:

- Advanced special topics courses for undergraduate students:
  - Astronomy
  - Electrodynamics
  - Quantum Mechanics
  - Special Relativity
  - Optics
- Calculus-based general physics: Newtonian mechanics, electricity and magnetism
- General physics laboratory for undergraduate students.

## RESEARCH INTERESTS

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- High Energy ( $E > 100$  MeV) and Very-high Energy ( $E > 100$  GeV) Gamma-Ray and Cosmic-Ray Astronomy
- Cosmic-Ray Anisotropy
- Pulsars, radio-quiete and radio-faint pulsars, blind search of radio-quiete  $\gamma$ -ray pulsars, magnetars.
- Pulsar wind nebula (PWN), pulsars-PWN connections
- High mass X-ray binaries
- Cooling of neutron stars
- Analysis of radio, X-ray, and  $\gamma$ -ray data
- Improvement of sensitivity of  $\gamma$ -ray telescopes
- Data mining through mathematical modeling.

## RESEARCH EXPERIENCE

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- **Research Assistant Professor at George Mason University**

Initiated and led an international team of scientists in a multiwavelength campaign to observe the binary system PSR B1259-63 during its 2010/2011 periastron passage. This included:

- Wrote proposal to the NASA *Fermi* guest investigating program in cycle 3 for which we were awarded \$80,000 of funding.
- Conducted observations at the Australian Telescope Compact Array (ATCA) in Australia.
- Issued 3 Astronomical Telegrams on behalf of the campaign on the detection and continuous monitoring of the source.
- Requested Target of Opportunitys (ToOs) with the *SWIFT*, *Suzaku*, and *INTEGRAL* X-ray satellites. All of which were granted.
- Lead a paper on the discovery of GeV  $\gamma$ -ray emission from the source which covers the multi-wavelength coverage of the source as well.

- **National Research Council Postdoctoral Research Associate**

As part of the *Fermi* gamma-ray space telescope international collaboration I worked with scientists from different countries including the USA, Italy, France, Spain, Austria, Germany, Iceland, Japan, and Sweden. My work included:

- Led the efforts for multiple scientific research projects that involved international collaborators. This led to several publications in refereed journals.
- Co-led an international team of scientists to carry out very-precise timing of newly discovered pulsars with the *Fermi* Large Area Telescope (LAT). This included the planning of the efforts, formulating the goals and techniques, coordinating and managing international team members, as well as the actual execution of the work and over sighting it.

- Developed several algorithms using C++ and Python that were used by the team in these projects.
  - One of my main contributions was the development of an algorithm to refine the search for pulsations from source candidates which resulted in many of the discoveries and confirmations of the  $\gamma$ -ray pulsars discovered with *Fermi*. Simply put this algorithm scans multidimensional parameter spaces and optimizes cuts on these parameters to achieve the highest signal from the source. As part of this search, my algorithm does a mathematical modeling of some of the source parameters. This has the advantage of greatly improving the speed of the search and decreasing the number of trials which has the effect of improving the significance of the detection of a source.
  - Worked on the on-orbit calibration of the LAT instrument onboard *Fermi*. This mostly involved getting temperature estimates for the crystals that make up the LAT. This was done by comparing on-orbit runs to muon runs done at CERN.
  - Helped organize an international workshop on *Fermi* data analysis, “High Energy Astrophysics in the Fermi Era”, which was held at the University of Guadalajara in Mexico where I also served as the main invited speaker for the workshop.
  - Due to my strong bilingual capabilities in Arabic and English, I was invited to participate in the week-long “Exploring the Gamma-Ray Universe with Fermi” workshop held at the American University in Cairo Egypt where most of the audience were Arabic speakers.
  - Attended several national and international conferences to present my work.
- **Graduate Research Assistant in High Energy Gamma-Ray Astrophysics**  
As a doctoral student I worked with international collaborators from the US and Mexico on the Milagro cosmic-ray detector in New Mexico. My work included:
    - Developed and implemented a new background rejection technique, written in C++, for the Milagro Cosmic-ray detector near Los Alamos, New Mexico.
      - \* This was crucial for the discovery of sources with Milagro since the noise in the experiment was overwhelming (a factor of 10,000 higher than the signal). This new technique differentiates between hadronic and  $\gamma$ -ray showers by looking at the fundamental differences in the shower parameters between these two types of showers and how they register in the detector.
      - \* This technique produced a set of  $\gamma$ -hadron separation parameters two of which are now adopted by the Milagro collaboration as the standard parameters to use in their search for  $\gamma$ -ray sources in the sky.
      - \* Using this new search technique, we searched five years of the data collected with Milagro for new  $\gamma$ -ray sources in the sky. This analysis resulted in the first discoveries of TeV  $\gamma$ -ray sources in Milagro
      - \* This technique is now adopted by the Milagro collaboration as the standard analysis technique to use in their search for TeV  $\gamma$ -ray sources in the sky.

- In addition to the development of this new  $\gamma$ -hadron separation technique, I also developed a new technique to determine the spectral shape of a source in Milagro. This is a crucial part for understanding the physics of the newly discovered sources.
- Worked on the calibration of the Milagro telescope. This included charge calibrations of the photomultiplier tubes in Milagro.



PUBLICATIONS

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**Publications with Significant Contributions:**

**Discovery of High-Energy Gamma-Ray Emission from the Binary System PSR B1259–63/SS 2883 Around Periastron with *Fermi***

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2011 submitted to ApJL

**The Fermi Large Area Telescope discovers the pulsar in the young galactic supernova remnant CTA 1**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2008, *Science*, 322, 1218

**Detection of 16 Gamma-Ray Pulsars Through Blind Frequency Searches Using the Fermi LAT**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, *Science*, 325, 840

**Eight gamma-ray pulsars discovered in blind frequency searches of Fermi LAT data**

Saz Parkinson, P. M. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 725, 571

**PSR J1907+0602: A Radio-Faint Gamma-Ray Pulsar Powering a Bright TeV Pulsar Wind Nebula**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 711, 64

**Fermi Large Area Telescope observations of PSR J1836+5925**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 712, 1209

**Precise Gamma-Ray Timing and Radio Observations of 17 Fermi Gamma-Ray Pulsars (Accepted for publication)**

Ray, Paul S. et al. [*Fermi*-LAT Collaboration] 2011, *ApJS*

**Milagro Observations of TeV Emission from Galactic Sources in the Fermi Bright Source List**

Abdo, A. A. et al. [Milagro collaboration], *ApJ* 700L 127A

**Discovery of Localized Regions of Excess 10-TeV Cosmic Rays**

Abdo, A. A. et al. [Milagro collaboration] 2009, *PRL* 101 221101

**Discovery of TeV Gamma-Ray Emission from the Cygnus Region of the Galaxy**

Abdo, A. A. et al. [Milagro collaboration], I. V. Moskalenko, A. W. Strong, *ApJ* 658, 33L

**TeV Gamma-Ray Sources from a Survey of the Galactic Plane with Milagro**

Abdo, A. A. et al. [Milagro collaboration], ApJ 664, 91L

**Discovery of Localized TeV Gamma-Ray Sources in the Galactic Plane with Milagro.**

Abdo A. A. Proceedings of the 30th International Cosmic Ray Conference.

**Discovery of TeV Gamma-Ray Emission from the Cygnus Region of the Galaxy with Milagro Using a New Background Rejection Technique.**

Abdo A. A. Proceedings of the First GLAST Symposium.

**Detection of TeV Gamma-Ray Emission from the Cygnus Region of the Galaxy with Milagro Using a New Background Rejection Technique.**

Abdo, A. A. Proceedings of The XII International Conference on Calorimetry in High Energy Physics CALOR06

**Fermi LAT observations of the Geminga pulsar**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 720, 272

**Detection of the energetic pulsar PSR B1509-58 and its pulsar wind nebula in MSH 15-52 using the Fermi Large Area Telescope**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 714, 927

**Radio Detection of LAT PSRs J1741-2054 and J2032+4127: No Longer Just Gamma-Ray Pulsars**

Camilo, F. et al. [*Fermi*-LAT Collaboration] 2009, ApJ, 705, 1

**Publications with the LAT collaboration:**

**Insights Into the High-energy gamma-ray Emission of Markarian 501 from Extensive Multifrequency Observations in the Fermi Era**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2011, ApJ, 727, 129

**Multi-wavelength Observations of the Flaring Gamma-ray Blazar 3C 66A in 2008 October**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2011, ApJ, 726, 43

**Three Radio Millisecond Pulsars in Fermi LAT Unassociated Bright Sources**

Ransom, S. M. et al. [*Fermi*-LAT Collaboration] 2011, ApJL, 727, L16

**Detection of gamma-ray flares from the Crab Nebula**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2011, *Science*, 331, 739

**Discovery of two millisecond pulsars with the Nancay radio telescope  
(Accepted for publication)**

Cognard, I. et al. [*Fermi*-LAT Collaboration] 2011, *ApJ*

**The first Fermi multifrequency campaign on BL Lacertae: characterizing the low-activity state of the eponymous blazar (Accepted for publication)**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2011, *ApJ*

**Fermi Observations of the Gamma-ray Outburst from 3C 454.3 in November 2010 (Submitted to journal)**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2011, *ApJL*

**Discovery of millisecond pulsars in radio searches of southern Fermi LAT sources (Accepted for publication)**

Keith, M. J. et al. [*Fermi*-LAT Collaboration] 2011, *MNRAS*

**A population of gamma-ray emitting globular clusters seen with the Fermi Large Area Telescope**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *A&A*, 524, A75

**SEARCH FOR GAMMA-RAY EMISSION FROM MAGNETARS WITH THE FERMI LARGE AREA TELESCOPE**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJL*, 725, L73

**Detection of the Small Magellanic Cloud in gamma-rays with Fermi/LAT**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *A&A*, 523, A46

**Fermi Large Area Telescope observations of Local Group galaxies: Detection of M31 and search for M33**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *A&A*, 523, L2

**Fermi-LAT Constraints on the Gamma-ray Opacity of the Universe**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 723, 1082

**Fermi Large Area Telescope Observation of a Gamma-ray Source at the Position of Eta Carinae**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 723, 649

**Fermi-LAT Study of Gamma-ray Emission in the Direction of Supernova Remnant W49B**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 722, 1303

**Gamma-ray Light Curves and Variability of Bright Fermi-Detected Blazars**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 722, 520

**Fermi Large Area Telescope and Multi-wavelength Observations of the Flaring Activity of PKS1510-089 between 2008 September and 2009 June**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 721, 1425

**The Fermi Large Area Telescope view of Misaligned AGN**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 720, 912

**The Fermi-LAT high-latitude Survey: Source Counts Distributions and the Origin of the Diffuse Background**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 720, 435

**Fermi Large Area Telescope Observations of Gamma-ray Pulsars PSR J1057-5226, J1709-4429, and J1952+3252**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 720, 26

**Fermi Large Area Telescope View of the Core of the Radio Galaxy Centaurus A**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 719, 1433

**Gamma-ray Emission Concurrent with the Nova in the Symbiotic Binary V407 Cygni**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *Science*, 329, 817

**Fermi LAT Observations of the Supernova Remnant W28 (G6.4-0.1)**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 718, 348

**Suzaku Observations of Luminous Quasars: Revealing the Nature of High-Energy Blazar Emission in Low-level activity States**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 716, 385

**The Spectral Energy Distribution of Fermi Bright Blazars**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 716, 30

**Fermi Large Area Telescope First Source Catalog**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJS*, 188, 405

**The First Catalog of Active Galactic Nuclei Detected by the Fermi Large Area Telescope**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 715, 429

**Fermi-Large Area Telescope Observations of the Exceptional Gamma-Ray Outbursts of 3C 273 in 2009 September**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJL, 714, L73

**Fermi Gamma-ray Imaging of a Radio Galaxy**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, Science, 328, 725

**The Vela Pulsar: Results from the First Year of Fermi LAT Observations**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 713, 154

**Fermi-LAT Observations of the Vela X Pulsar Wind Nebula**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 713, 146

**Discovery of Pulsed Gamma-rays from PSR J0034-0534 with the Fermi LAT: A Case for Co-located Radio and Gamma-ray Emission Regions**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 712, 957

**The First Fermi Large Area Telescope Catalog of Gamma-ray Pulsars**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJS, 187, 460

**Constraints on Cosmological Dark Matter Annihilation from the Fermi-LAT Isotropic Diffuse Gamma-Ray Measurement**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, JCAP, 04, 014

**Observations of the Large Magellanic Cloud with Fermi**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, A&A, 512, A7

**Fermi detection of delayed GeV emission from the short GRB 081024B**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 712, 558

**Observation of Supernova Remnant IC 443 with Fermi-Large Area Telescope**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 712, 459

**Observations of Milky Way Dwarf Spheroidal galaxies with the Fermi-LAT detector and constraints on Dark Matter models**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 712, 147

**Spectrum of the isotropic diffuse gamma-ray emission derived from first-year Fermi Large Area Telescope data**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *Phys. Rev. Lett.*, 104, 101101

**Fermi LAT Search for Photon Lines from 30 to 200 GeV and Dark Matter Implications**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *Phys. Rev. Lett.*, 104, 091302

**Spectral Properties of Bright Fermi-detected Blazars in the Gamma-ray Band**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 710, 1271

**PKS 1502+106: a new and distant gamma-ray blazar in outburst discovered by the Fermi Large Area Telescope**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 710, 810

**Fermi observations of Cassiopeia and Cepheus: diffuse gamma-ray emission in the outer Galaxy**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 710, 133

**Fermi-LAT discovery of GeV gamma-ray emission from the young Supernova remnant Cassiopeia A**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJL*, 710, L92

**Detection of Gamma-Ray Emission from the Starburst Galaxies M82 and NGC 253 with the Large Area Telescope on Fermi**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *ApJL*, 709, L152

**A change in the optical polarization associated with a gamma-ray flare in the blazar 3C 279**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *Nature*, 463, 919

**Gamma-ray Emission from the Shell of Supernova Remnant W44 Revealed by the Fermi LAT**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, *Science*, 327, 1103

**GAMMA-RAY AND RADIO PROPERTIES OF SIX PULSARS DETECTED BY THE FERMI LARGE AREA TELESCOPE**

Weltevrede, P. et al. [*Fermi*-LAT Collaboration] 2010, *ApJ*, 708, 1426

**Fermi Observations of the Very Hard Gamma-ray Blazar PG 1553+113**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 708, 1310

**Fermi Large Area Telescope Observations of the Crab Pulsar and Nebula**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2010, ApJ, 708, 1254

**Fermi observations of TeV-selected AGN**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, ApJ, 707, 1310

**Multiwavelength monitoring of the enigmatic Narrow-Line Seyfert 1 PMN J0948+0022 in March-July 2009**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, ApJ, 707, 727

**Fermi Observations of High-Energy Gamma-Ray Emission from GRB 080825C**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, ApJ, 707, 580

**Fermi Large Area Telescope Gamma-Ray Detection of the Radio Galaxy M87**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, ApJ, 707, 55

**Fermi LAT detection of pulsed gamma-rays from the Vela-like pulsars PSR J1048-5832 and PSR J2229+6114**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, ApJ, 706, 1331

**Radio-Loud Narrow-Line Seyfert 1 as a new class of gamma-ray AGN**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, ApJL, 707, L142

**Fermi large area telescope observations of the cosmic-ray induced gamma-ray emission of the Earth's atmosphere**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, Phys. Rev. D, 80, 122004

**Fermi Large Area Telescope measurements of the diffuse gamma-ray emission at intermediate Galactic latitudes**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, Phys. Rev. Lett., 103, 251101

**Modulated High-Energy Gamma-ray emission from the Microquasar Cygnus X-3**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, Science, 326, 1512

**The On-orbit Calibrations for the Fermi Large Area Telescope**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, *Astropart. Phys.*, 32, 193

**Fermi Observations of GRB 090902B: A Distinct Spectral Component in the Prompt and Delayed Emission**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, *ApJL*, 706, L138

**Fermi LAT Observations of LS5039**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, *ApJL*, 706, L56

**Fermi-LAT Discovery of Extended Gamma-ray Emission in the Direction of Supernova Remnant W51C**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, *ApJL*, 706, L1

**A limit on the variation of the speed of light arising from quantum gravity effects**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, *Nature*, 462, 331

**Fermi LAT Observation of Diffuse Gamma-Rays Produced Through Interactions between Local Interstellar Matter and High Energy Cosmic Rays**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, *ApJ*, 703, 1249

**Pulsed gamma-rays from PSR J2021+3651 with the Fermi Large Area Telescope**

Abdo, A. A. et al. [*Fermi*-LAT Collaboration] 2009, *ApJ*, 700, 1059

**Fermi LAT Observations of LS I +61 303: First Detection of an Orbital Modulation in GeV Gamma Rays**

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**A Population of Gamma-Ray Millisecond Pulsars Seen with the Fermi Large Area Telescope**

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