| Prp. ID | PI Name (f) | PI Name (l) | Title | Abstract |
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| 81007 | PAUL | SMITH | THE GAMMA-RAY / OPTICAL CONNECTION IN BLAZARS DURING THE FERMI ERA (Large Project) | We propose to continue optical monitoring of blazars observed by Fermi that will provide a comprehensive public data archive that includes high-quality spectropolarimetry throughout its entire planned 10-yr mission. These data are particularly important, as they yield direct information on the magnetic field within the source of the continuum emission. Our data have been successfully used to help constrain the location of the gamma-ray and optical emission from blazars. We have delivered a public archive of nearly 8000 observations of around 60 blazars (available at http://james.as.arizona.edu/~psmith/Fermi). Support for this program will enable continued spectropolarimetry and spectrophotometry of gamma-ray-bright blazars during monthly week-long campaigns. |
| 81081 | MATTHEW | LISTER | THE PARSEC AND KILOPARSEC JET PROPERTIES OF MOJAVE AGN (Large Project) | We propose to obtain and analyse radio observations of over 300 AGN under the MOJAVE program in support of the Fermi mission. Our long term project is investigating the pc-scale structural and polarization evolution of relativistic jets, to better understand their duty cycles and connections to gamma-ray activity. We are also carrying out observations with the VLA, LOFAR, Chandra, and HST to characterize their overall kiloparsec structure and kinetic power, and to test unified AGN models and the fast spine-slow sheath structure proposed for TeV BL Lac objects. Our project has already secured substantial observing time, and will result in a large publically-available set of multi-wavelength supporting data for the most heavily monitored AGN in the northern sky. |
| 81001 | BRIAN | METZGER | PROBING PARTICLE ACCELERATION AT NON-RELATIVISTIC SHOCKS WITH GAMMA-RAY NOVAE | The discovery by Fermi LAT of GeV gamma-rays from classical novae illustrates that shocks and high energy particle acceleration are common in nova outflows. A model will be further developed for the multi-wavelength thermal and non-thermal emission of nova shocks that includes for the first time effects such as radiative cooling of the shocked gas, a self-consistent treatment of the ionization of the unshocked medium, and the effects of relativistic particles and magnetic fields on the compressibility and emission of the post shock gas. Fermi detections of novae will be used in combination with gamma-ray, optical, and radio data to constrain the efficiency and spectrum of non-thermal particle acceleration and magnetic field amplification in non-relativistic shocks. |

| Prp. ID | PI Name (f) | PI Name (l) | Title | Abstract |
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| 81039 | PABLO | SAZ PARKINSON | A SYSTEMATIC SEARCH FOR THE HIGHEST-ENERGY EMISSION FROM GAMMA-RAY PULSARS WITH THE FERMI LARGE AREA TELESCOPE | Studies of gamma-ray pulsars have received a huge boost in recent years, due to advances in both space-based (e.g. Fermi-LAT) and ground-based (e.g. MAGIC, VERITAS) observations. The number of known gamma-ray pulsars has increased dramatically, currently standing at over 160. More than a dozen pulsars are now detected above 25 GeV, and one (the Crab) has been detected up to TeV energies, severely challenging current models of pulsar emission and opening up the possibility of using pulsars as a tools for sensitive tests of quantum gravity. We propose a systematic search for high-energy emission from all gamma-ray pulsars, using the latest (Pass 8) LAT data, the most up-to-date timing models, and some refined techniques, improving on our previously published work in this area (1FHL Catalog). |
| 81041 | CHI (TEDDY) | CHEUNG | PROMPT FOLLOW-UP OF FLARING/TRANSIENT FERMI-LAT GALACTIC PLANE SOURCES | We propose a comprehensive search and follow-up program of flaring/transient Fermi-LAT Galactic plane gamma-ray sources. Essential to this effort are the VLA observations requested here. At high-significance (>=5 sigma), we expect 2-3 all-sky events/year, with ~2/3 visible with the VLA, thus request up to 2 ToOs. Together with pre-approved Swift XRT/UVOT observations, we aim to identify plausible radio, X-ray, and optical counterparts following the LAT event via expected correlated variability. In case a plausible VLA counterpart is identified, we will obtain further radio follow-up with our OVRO and LWA1 partners. After the successful discovery of novae as a class of GeV emitters, these coordinated observations will enable us to uncover even rarer types of Galactic gamma-ray transients. |
| 81051 | EILEEN | MEYER | A UNIQUE USE OF FERMI TO SOLVE THE X-RAY ORIGIN PROBLEM IN LARGE-SCALE JETS | The unexpected (but now routine) detection of X-rays from powerful AGN jets on kpc scales with high-resolution Chandra imaging has raised a debate as to their origin which has remained open for over a decade. Two different physical processes have been advanced to explain these X-rays, with important implications for our understanding of jet physics, and the impact of jets on their environments. We propose a unique use of Fermi observations to conclusively confirm or rule out one of these mechanisms for over a dozen X-ray detected jets, following on the success of a recent application of this method to the well-known jets in 3C 273 and PKS 0637-752. |

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| 81056 | EDO | BERGER | RAPID SPECTROSCOPY OF FERMI GRBS: REDSHIFTS, ENERGETICS, AND HOST GALAXIES | Rapid spectroscopy of GRB afterglows enables a wide range of studies related to basic GRB physics (redshifts, energetics), the progenitors (metallicities), the properties of high-redshift galaxies (chemical abundances), and potentially fundamental physics (Lorentz invariance violation). As such, rapid spectroscopy is the most essential correlative observation for Fermi GRB studies. Here we request support for our rapid spectroscopy program (using Gemini, Magellan, MMT, LBT), which will provide redshifts and metallicities. We will further combine the redshifts with approved late-time JVLA observations to determine beaming-independent energies for Fermi GRBs, and assess whether Fermi and Swift bursts are similar. The data will be released to the community in real-time via GCN circulars. |
| 81065 | KEVIN | HURLEY | MAINTAINING THE FERMI GBM IN THE 3RD INTERPLANETARY NETWORK | We propose to continue our successful program of maintaining the Fermi Burst Monitor in the 3rd Interplanetary Network of Gamma-Ray Burst detectors. This will 1) assist the Fermi team in understanding and reducing their systematic localization uncertainties, 2) reduce the sizes of the GBM error circles by several orders of magnitude, 3) facilitate the identification of GRB sources with objects found by ground- and space-based observatories at other wavelengths, 4) reduce the uncertainties in associating some LAT detections of high energy photons with GBM bursts, 5) discover and monitor magnetars, and 6) facilitate searches for non-electromagnetic GRB counterparts, particularly neutrinos and gravitational radiation. We will make our results public as soon as they are available. |
| 81066 | ANN | WEHRLE | OPTICAL TIME VARIABILITY OF OJ287, 3C446 AND OTHER FERMI BLAZARS IN KEPLER K2 FIELDS | We propose to characterize the minutes-to-months optical variability of gamma-ray blazars and relate it to their contemporaneous and historical gamma-ray characteristics. Continuously sampled, simultaneous gamma-ray and optical data present an unprecedented opportunity to study synchrotron and inverse Compton processes in relativistic jets. We are using the K2 mission to obtain optical light curves of 23 Fermi blazars. The combined precision and frequent time-sampling are the best ever obtained for gamma-ray blazars. We measure the power spectral densities of the light curves and determine their slopes. We evaluate the gamma-ray activity level during K2 observations using 30-day integrations of LAT data and characterize long term variability using seven years of Fermi LAT data. |

| Prp. ID | PI Name (f) | PI Name (l) | Title | Abstract |
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| 81085 | AMANPREET | KAUR | HUNTING HIGH-REDSHIFT BL LACERTAE OBJECTS | We will perform coordinated, accurate, 13-filter photometry, using Swift and GROND, with the goal of measuring photometric redshifts for the Fermi BL Lacs (unknown z) visible from Chile. The coupling of the GROND and UVOT filters allows us to determine accurate photo-z in the 1.3--8.0 redshift range. We will target 300 objects and expect to find 30-45 of them at z>1.3 thus doubling the current number of high-z sources. While undoubtedly rare, these detections represent a major achievement as high-z BL Lacs probe the UV-optical radiation field and allow us to understand the evolution of the blazar family. This program will provide simultaneous high-quality IR-to-X-ray data that will be released to the general public. This proposal requests support for this indispensable US-lead effort. |
| 81087 | ANDREW | SMITH | CONTINUED MULTI-WAVELENGTH OBSERVATIONS OF THE SURPRISING TEV BINARY LS I +61 303 | We propose to continue our successful Cycle 7 program of multi-wavelength monitoring of the TeV Binary system LS I +61 303 with VERITAS (TeV), Fermi-LAT (GeV), Swift-XRT (0.3-10 keV), Radio (RATAN/AMI), and Ritter (H-alpha). The preliminary results from our Cycle 7 observations resulted in the strongest TeV activity ever detected from the source and were reported in ATEL #6785. We seek support from the Fermi GI program to continue this fruitful multi-wavelength campaign for the 2015-2016 observing season which will allow for the multi-year behavior of the system to be more accurately understood. We will also continue our analysis of many years of multi-wavelength data (dating back to 2006), which is forming the cornerstone of a PhD thesis. |
| 81091 | TONIA | VENTERS | CASCADE ANISOTROPY PROBES OF THE MAGNETIZED UNIVERSE | Cascades of TeV gamma-rays provide a natural probe into the properties of the intergalactic magnetic field, a topic with profound implications for magnetic fields in the early universe and large-scale structure and the origins of the highest energy cosmic rays. Ongoing observations of high-frequency-peaked BL Lac (HBL) gamma-ray by the Fermi-LAT and TeV telescopes present a unique opportunity to study the IGMF. The IGMF deflects TeV cascades resulting in changes in the measured spectra and angular size of TeV sources. Through these sources' contribution to the extragalactic gamma-ray background (EGB), the IGMF leaves an imprint on the EGB anisotropy. We will model the effect of the IGMF on GeV and TeV observations of HBLs and the EGB anisotropy to probe its properties. |

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| 81095 | ADAM | GOLDSTEIN | SPECTRAL LAGS FROM PHOTON FLUX LIGHTCURVES OF BRIGHT GBM GRBS | A known characteristic of GRB lightcurves (LCs) is that the low energy LC of a GRB tends to lag behind the higher energy LC. Different physical explanations have been proposed to explain this observation. Current methods use the GRB count rate LCs, which makes the interpretation of results more difficult because they ignore the detector physics modeled in the detector response. Furthermore, different spectral components are not considered when studying the lag. For these reasons, we propose to take a sample of the brightest GRBs that have been observed by GBM and perform a fine-time resolved spectral analysis using different spectral emission models. This will result in deconvolved photon flux LCs which will be investigated for spectral lag, and theoretical connections will be explored. |
| 81126 | REGINA | CAPUTO | A CONCLUSIVE VIEW ON PAIR HALO DETECTION AND THE INFERRED INTERGALACTIC MAGNETIC FIELD CONSTRAINTS | The strength of the intergalactic magnetic field (IGMF) is poorly constrained. It can however be measured through observations of extended emission around extragalactic TeV sources, such as active galactic nuclei (AGN). In the intergalactic medium, TeV photons pair produce and up-scatter lower energy photons to GeV energies; forming a pair halo of extended emission around the AGN. The spectral component of this halo can be used to measure the IGMF. We propose to investigate tentative claims of pair halo detection using a Pass 8 analysis. Our approach uses two simulations of cascade emission in the presence of the IGMF to model the morphology and spatial distribution of the halos. The proposed analysis will provide a conclusive view on the detectability of halo emission. |
| 81132 | JAY | STRADER | UNCOVERING FERMI GALACTIC BINARIES WITH SOAR SPECTROSCOPY | We request support to sustain a successful spectroscopic and photometric program to discover and characterize new Galactic compact binaries among unidentified Fermi sources. Our aim for this project is to obtain spectroscopic orbital solutions for 20 new Galactic Fermi sources, most of which are likely to be new pulsar binaries, by the end of the two-year project. Our guaranteed telescope time and regular observing cadence constitute a unique opportunity to add value to the Fermi mission through ground-based correlative observations. |

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| 81164 | COLLEEN | WILSON-HODGE | STUDIES OF ACCRETING BINARY PULSARS WITH THE FERMI GAMMA-RAY BURST MONITOR IN CYCLES 8 AND 9 | Since Cycle 1 we have been continuously monitoring the full sky with Fermi GBM for pulsars with spin frequencies in the 1 mHz to 2 Hz (to 16 Hz starting in cycle 7) range. We conduct daily blind searches to discover previously unknown or quiescent pulsars. We also perform source specific analyses to track the evolving pulse frequencies of all detected pulsars, resulting in time histories of the pulse profile, pulsed flux, and frequency of these sources. We are providing, through our website and ATels, quick-look estimates of pulsed flux and frequency for use in multi-wavelength observations. We propose to continue this pulsar monitoring in cycles 8 & 9, and to perform detailed studies of the transient systems EXO 2030+375 and GRO J1008-57. |
| 81168 | ELEONORA | TROJA | RAPID FOLLOW-UP OF FERMI LAT GAMMA-RAY BURSTS | GRBs with high-energy emission are providing the first glimpses onto a new realm of phenomena, from the physics of GRBs and their central engines to theories of quantum gravity, and constraints on the extra-galactic background light. Here we propose to continue our successful follow-up program of LAT detected GRBs aimed at providing rapid and accurate localizations, photometric redshifts, and multi-color afterglow observations. |
| 81171 | STEPHEN | CENKO | FERMI-LAT GRB AFTERGLOWS AND CALORIMETRY | We propose here to continue our successful program to provide complementary multi-wavelength observations of well-localized gamma-ray bursts (GRBs) detected by the Fermi Large Area Telescope. Specifically, our program is designed to 1) identify long-wavelength (optical and radio) counterparts, 2) obtain spectroscopic redshifts, and 3) measure beaming-corrected energies (burst plus afterglow) of Fermi-LAT GRBs. This study will provide us with new insights into the least understood aspect of GRBs -- the central engines -- by constraining the maximum energy available for progenitor models (e.g., magnetars and black holes). |
| 81174 | MATTHEW | BARING | CALIBRATION OF POTENTIAL GAP GEOMETRY AND SURFACE HEATING IN FERMI-LAT PULSARS | A major portion of Fermi's pulsar legacy has been the identification of exponential maximum energy turnovers in the 1-8 GeV band in most pulsars. This project aims to aid interpretation of these turnovers by exploring opacities due to two-photon pair creation. We will perform a comprehensive study of pair opacities in different magnetospheric locales, incorporating rotational sweepback of field lines. Surface heating by return-current pairs will be computed as functions of gap altitude and colatitudinal width. A central focus will be on Fermi pulsars with visible thermal X-ray emission, such as Geminga and PSR J1836+5925. Their X-ray fluxes will be used to calibrate the gap dimensions, leveraging additional input from caustic and outer gap pulse profile constraints on the geometry. |

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| 81175 | MANEL | ERRANDO | SEARCH FOR GEV PAIR HALOS AROUND LOW-REDSHIFT BLAZARS | The origin of the magnetic fields in galaxies and clusters is a long-standing open question in cosmology and astrophysics. It is assumed that they result from amplification of weaker seed fields, which may exist in the intergalactic medium but have never been detected. Electromagnetic cascades initiated by TeV gamma-rays from blazars are sensitive to the presence of intergalactic magnetic fields, which affect the intensity and extent of secondary GeV emission that could be detected by Fermi-LAT. We propose to combine a stacking analysis of TeV blazars with the fact that the TeV-induced cascades develop along the projected direction of the blazar jet, which is known from imaging radio observations. The method provides a significant sensitivity improvement with respect to previous searches. |
| 81176 | FRANK | SCHINZEL | THE POPULATION OF STEADY GAMMA-RAY EMITTERS AMONG FERMI-LAT UNASSOCIATED SOURCES | We aim to undertake a detailed examination of every Fermi detected object not associated with a known source type. In 3FGL (4-years of data) a large fraction (33%) of the sources remain unassociated. We will continue our previous work in radio/gamma-ray association, which was proposed in cycle 7 focusing on 3FGL but only partly funded, to greatly increase the number of radio/gamma-ray associations. We ask for support to complete the originally proposed analysis of the properties of "atypical" objects with peaked or steep spectrum radio counterparts and to confirm a population of steady gamma-ray emitters for which we found evidence comparing 2FGL with 3FGL. We also found evidence for a new population of steady, radio-quiet gamma-ray sources that we expect to confirm as a new source class. |
| 81183 | ANDREI | BELOBORODOV | MECHANISM OF GAMMA-RAY EMISSION FROM PULSARS | We propose to study the mechanism of gamma-ray emission from pulsars using first-principle global simulations of the pulsar magnetosphere. We have developed the first particle-in-cell code that follows the electron-positron discharge in the magnetosphere, tracks the production of gamma-rays and their conversion to pairs. Our first results identify the position of the electric ``gap'' where the particles are accelerated and suggest that the observed gamma-rays come from the Y-shaped current sheet. We propose to study the gap structure and describe it as a function of the pulsar rotation rate and magnetic field. These results will be used for modeling Fermi LAT observations. |

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| 81185 | VAHE' | PETROSIAN | TESTING ACCELERATION, TRANSPORT AND RADIATION IN SOLAR FLARES BASED ON FERMI-LAT AND RELATED DATA | Observations of solar flares by Fermi and other instruments (RHESSI, SDO, GOES etc.) provide an unprecedented opportunity for investigation of the radiation, transport and acceleration mechanisms (and sites) of electrons and ions. We propose a combined data analysis (of X-ray, EUV, SEP and Fermi-LAT)and detailed theoretical modeling. We have led the analysis of these data and have been active in developing tools for modeling. Thus, we are in a unique position to take full advantage of this opportunity. We will consider a hybrid electron bremsstrahlung and pion decay radiative model and a a hybrid stochastic acceleration by turbulence and by the CME shock. Recent Fermi-LAT detection of two bright behind the limb flares make these consideration more compelling. |
| 81206 | IGNACIO | TABOADA | JOINT OBSERVATIONS OF GRBS WITH FERMI AND HAWC | Understanding the high-energy emission from gamma-ray bursts (GRBs) is important for probing particle acceleration mechanisms and the bulk Lorentz factor of the GRB outflow. High-energy GRB observations also provide a probe of the extragalactic background light (EBL), which is of cosmological interest. We propose joint observations of GRBs with HAWC and Fermi. HAWC is an operational ground based very-high-energy detector with a large field of view, FoV, (~2 sr) and demonstrated >95% duty cycle. We will search the HAWC data for emission from GRBs detected by Fermi and create broadband prompt spectra. HAWC is sensitive to some of the brightest GRBs if their emission extends even slightly above that already observed by Fermi. |
| 81207 | FABIO | ANTONINI | UNDERSTANDING GAMMA-RAY EMISSION FROM THE GALACTIC CENTER: CONSTRAINING THE MILLISECOND PULSAR POPULATION | Our study is motivated by Fermi-LAT observations indicating a diffuse gamma-ray source with a steeply rising 3D radial profile in the inner Galaxy. The origin of this source has been linked to either a population of millisecond pulsars(MSPs) or dark matter. Direct summation N-body simulations as well as sophisticated Monte-Carlo models will be used to make predictions about the expected distribution of the MSPs in the Galactic center. We will further use current observations and recently developed codes for modeling pulsar survey selection effects to place limits on the absolute number of the MSPs. The combination of observational constraints and dynamical models will allow us to draw conclusions about whether the Fermi-LAT diffuse signal can be fully accounted for by a MSP population. |

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| 81214 | MARCELLO | GIROLETTI | BREAKING THE DEGENERACY IN BLAZAR PHYSICS THROUGH COMBINED VLBA AND LAT OBSERVATIONS | This project exploits the unique capabilities of the NRAO VLBA in conjunction with Fermi-LAT survey data for a time resolved characterization of the blazar zone in Mrk501. This target is the prototype of the high-synchrotron peaked blazar class and it has been the subject of a continuous broad band monitoring campaign since the launch of Fermi. We plan to carry out multi-frequency, phase referenced VLBA observations in order to simultaneously determine the core-shift effect and the self-absorption parameters. In turn, this will constrain the energy density of the magnetic field and the non-thermal electrons. These results will allow us to break degeneracies in the theoretical model parameters used to describe the broadband emission. |
| 81234 | LEO | SINGER | DISCOVERING GBM GRB AFTERGLOWS WITH IPTF | Here we propose a joint program between the Gamma-Ray Burst Monitor (GBM) aboard Fermi and the intermediate Palomar Transient Factory (iPTF) to systematically identify the optical afterglows of GBM gamma-ray bursts (GRBs). As demonstrated by our first eight GBM-iPTF discoveries, the large field-of-view, robotic operations, and transient detection software pipeline make iPTF the ideal tool for such an effort. The unique capabilities of the GBM offer access to at least three scientifically compelling GRB samples in greatly expanded numbers: rare, nearby events; bright, highly-collimated outflows; and, short-hard bursts. In addition, we see this as a valuable service to the entire Fermi GRB Community as our localizations and redshift benefit all GBM GRB studies. |
| 81238 | DANIEL | KOCEVSKI | THE FERMI ALL-SKY VARIABILITY ANALYSIS (FAVA) | We propose to study the variable gamma-ray sky through the use of the Fermi All-sky Variability Analysis. Unlike a traditional likelihood analysis, the analysis performed by FAVA is independent of any model for the diffuse gamma-ray emission, making it especially sensitive to variable sources in the Galactic plane. The analysis is also computationally inexpensive, allowing for blind searches for flux variations over the entire sky. We propose to use FAVA to continue to detect, characterize, associate, and report new unidentified gamma-ray sources in real time. We also propose to extend FAVA to study different timescales and energy bands, including energies below 100 MeV through the use of the new P8 data selection, which may lead to the discovery of entirely new classes of variable sources |

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| 81239 | ALICE | HARDING | MODELING ORBITALLY MODULATED GAMMA RAYS FROM MILLISECOND PULSAR BINARIES | A large number of new Black Widow (BW) and Redback (RB) energetic millisecond pulsars have been discovered through radio searches of unidentified Fermi sources, increasing the known number of these systems from 4 to 26. We propose to model the high-energy emission components from particles accelerated to several TeV in intrabinary shocks in the known BW and RB systems, and its predicted modulation at the binary orbital period. Synchrotron emission is expected at X-ray energies and such modulated emission has already been detected by Chandra. Inverse Compton emission from accelerated particles scattering the UV emission from the radiated companion star is expected in the Fermi and TeV bands. Detections or constraints on this emission will probe the unknown physics of pulsar winds. |
| 81247 | MARCO | AJELLO | VERITAS OBSERVATIONS OF A SAMPLE OF HARD NEW FERMI-LAT SOURCES | Extragalactic very high-energy (VHE) sources are powerful probes of the extragalactic background light and of the intergalactic magnetic field. They are among the most powerful accelerators known in the Universe and might be responsible for the extragalactic gamma-ray background at >50GeV. They could also accelerate cosmic rays, whose interaction along the line of sight with the CMB/EBL, might produce the observed gamma rays. Due to their small field of view, Cherenkov telescopes have to rely on other observatories to discover new VHE candidates. Here we propose VERITAS observations of 6 sources detected by Fermi-LAT at >50 GeV. All of them have photons detected by Fermi at >100 GeV which should ensure a detection by VERITAS in a few hours. |
| 81286 | GEORGE | YOUNES | FERMI/GBM VIEW OF THE MAGNETARS PERSISTENT HARD X-RAY EMISSION | Magnetars emit a large fraction of their energy budget in the hard X-ray band above 10 keV. The spectral shape of their persistent hard X-ray emission is consistent with a non-thermal origin. Upper limits at higher energies (>800 keV) indicate the existence of a cutoff at energies <500 keV. The detection of such a cutoff, which has only been seen in one source, is extremely important to establish the exact energy where their hard X-ray spectrum peaks, and to determine the true total energy budget of magnetars. Here, we propose to study the persistent high energy 10-1000 keV emission from 10 known and newly discovered magnetars using the unique capabilities of the FERMI/Gamma-ray burst monitor, which has been surveying the high-energy sky for more than 6 years. |

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| 81288 | RONALD | MURPHY | IMPROVED SOLAR-FLARE PION-DECAY SPECTRA | Fermi/LAT detected pion-decay emission from >30 solar flares. Investigators analyzing several of these events used calculations obtained with our pion-production code which calculates pion-decay spectra at production, deep in the solar atmosphere. But the shape and intensity of this spectrum are modified as the photons escape, especially for the 30% of events located near the solar limb. Not currently accounted for, this will impact the energetic ion information (spectral shape and numbers) derived for such flares. We propose to calculate escaping pion-decay spectra with a Monte-Carlo calculation of photon transport through a realistic spherical atmosphere and provide the resulting spectra as a function of viewing angle and ion spectral shape for use by all researchers analyzing LAT data. |
| 81290 | ANDREY | TIMOKHIN | OUTER GAP CASCADES: A MODERN VIEW | High energy emission accompanying particle acceleration and pair production in outer gaps is one of the most frequently used scenarios for explaining gamma-ray emission from pulsars. However, theoretical models describing these zones are outdated and based on the assumption of stationarity of plasma flow through the gap, which recently has been shown to be incorrect. I propose to develop self-consistent kinetic microscopic models for outer gap cascade zones in pulsar magnetosphere which takes into account recent developments in global pulsar modeling. I will compute luminosities and spectra of gamma-rays produced in outer gaps and compare them with Fermi data. |
| 81291 | MENG | SU | PROBING THE MAGNETIC FIELD STRUCTURE ALONG THE EDGE OF THE FERMI BUBBLES | Fermi-LAT data revealed a pair of gigantic gamma-ray emitting bubbles called the Fermi bubbles towards the inner Galaxy. The origin of the structure is still highly debated and the impact to the ISM is still unclear. The bubbles might be magnetized, quasi-freely expanding rarified cavities with highly tangled field lines. Knowledge of the physical conditions on the expanding surface of the bubbles into the Galactic halo (possibly a shock front), in particular the magnetic field strength and configuration, is crucial to explore the effects from the bubbles to the Galactic halo interstellar medium. We propose to perform joint analysis with up-to-date Fermi-LAT data and Jansky VLA data to study the magnetic field along the edge of the Fermi bubbles. |
| 81292 | DACHENG | LIN | SEARCHING FOR X-RAY COUNTERPARTS TO THE 3FGL SOURCES | During its first four years of operations, the {\it Fermi} Large Area Telescope has identified 3034 GeV sources, revolutionizing gamma-ray astronomy. It has been a great challenge to identify their lower energy counterparts. We propose to apply our newly established X-ray source classification method to systematically search for X-ray counterparts to these gamma-ray sources, especially those unassociated, using deep X-ray observations by the state-of-the-art X-ray observatories XMM-Newton and Chandra over more than one decade. |

| Prp. ID | PI Name (f) | PI Name (l) | Title | Abstract |
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| 81293 | ELENA | ORLANDO | LINKING LAT GAMMA-RAY AND RADIO OBSERVATIONS OF THE GALACTIC DIFFUSE EMISSION PRODUCED BY COSMIC RAYS | Cosmic rays propagate in our Galaxy and interact with the interstellar medium and magnetic fields. As a result diffuse gamma-ray and radio/microwave emissions are produced. We propose to explore and combine latest LAT gamma-ray and radio/microwave data of these diffuse emissions to reveal new insights on cosmic rays and magnetic fields, and revise present cosmic-ray propagation models. |