| prop_num | pi_lname | title | Abstract |
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| 101003 | LYUTIKOV | EARLY GRB AFTERGLOWS AND FERMI LAT PHOTONS FROM LONG-LASTING ULTRA-RELATIVISTIC WINDS | We will develop analytical, numerical and radiative models of early GRB afterglows with the dominant X-ray contribution coming from the reverse shock propagating in highly relativistic magnetized wind of a long-lasting central engine. Our preliminary results indicate that even weakly magnetized outflows generate highly magnetized regions near the contact surface. We will study reconnection effects in the highly magnetized region and relate the corresponding radiative signatures to Fermi LAT signals. We expect that the model will naturally explain afterglow plateaus, flares, fast optical variations, absence of naked GRBs, missing/achromatic jet breaks, missing orphan afterglows and other puzzling GRB features. |
| 101004 | METZGER | THE EMERGING PICTURE OF SHOCKS IN 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 clear correlation exists between the optical and gamma-ray light curves in some novae, but the onset of the gamma-ray emission is systematically delayed from the optical peak. Mechanisms responsible for this delay will be explored, including ineffective particle acceleration near the shock at early times, or inelastic Klein-Nishina down-scattering in the upstream gas. Additional information on the conditions near the shock will be obtained by modeling NuSTAR upper limits/detections on extensions of the LAT emission to lower energies, accounting for Coulomb and bremsstrahlung losses in the dense post-shock gas. |
| 101036 | MARSCHER | VLBA AND FERMI MONITORING OF GAMMA-RAY BLAZARS AT 43 GHZ | The investigators propose to continue their monitoring of 37 gamma-ray and radio bright active galactic nuclei with the VLBA and the Fermi-LAT. The total and polarized intensity VLBA images at 43 GHz reveal events in the parsec-scale jet - superluminal knot ejections and flares in the knots and core region - associated with flares at gamma-ray and other wavebands. Together with multi-waveband data, this determines the location of the flaring site, crucial to our understanding of the physical processes involved. Continued observations of the previous sample will reveal any repeated patterns, as well as highlight differences between radio and gamma-ray events that are related and those that are not. The images and calibrated VLBA data are providing an extremely valuable legacy dataset. |

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| 101040 | LISTER | TXS 0128+554: A RARE YOUNG GAMMA-RAY LOUD AGN? | With the MOJAVE program we have potentially identified a rare example of a gamma-ray loud AGN (3FHL J0131.1+5546) being associated with a young, misaligned radio source, and propose a multi-frequency VLBA study to confirm this scenario. If our hypothesis proves correct, this AGN will serve to revise our current understanding of gamma-ray emission in AGN jets, and will expand the target list for high-energy (TeV) observations of AGN to include the compact symmetric object class. |
| 101045 | ROMANI | OPTICAL COUNTERPARTS FOR LAT PULSARS AND UNIDENTIFIED SOURCES | We propose a program of optical imaging to study counterparts for the best and brightest LAT unidentified sources. These are likely binary millisecond pulsars and the data will constrain the orbital properties, enabling a meaningful search for pulsations directly in the LAT gamma-ray data. We augment this with light curve measurements of LAT black widows and redbacks and narrow band images of Halpha bow shocks around LAT pulsars. For the brighter targets, exploratory low- to medium- resolution spectroscopy constrains the nature of the optical counterparts. This study completes the identifications of the bright LAT sources. |
| 101066 | KARGALTSEV | MULTIWAVELENGTH IDENTIFICATION OF FERMI LAT SOURCES | About 30% of Fermi LAT sources remain unidentified, of which 120 have Chandra/XMM coverage. We aim to unveil the nature of particle accelerators in these gamma-ray sources with the aid of a reliable multiwavelength classification tool, which uses X-ray/optical/NIR/IR data, machine-learning algorithms, and the training dataset we created. We will also use 9 years of Fermi LAT data to refine the LAT source positions, produce the multiwavelength SEDs, and perform the LAT variability analysis. We expect to (1) increase the number of identified 3FGL sources, (2) isolate a fraction of gamma-ray sources without plausible counterparts at other wavelengths, (3) gain insight into the particle acceleration processes in gamma-ray sources, (4) serendipitously classify a large number of X-ray sources. |
| 101069 | MASSARO | COMPLETING THE OPTICAL SPECTROSCOPIC CAMPAIGN OF THE GAMMA-RAY BLAZAR CANDIDATES | One of the main scientific objectives of the Fermi-NOAO Cooperative Arrangement is: studying candidate counterparts, including redshift determination of previously unknown BL Lacs and high-redshift blazars. We propose to complete our optical spectroscopic campaign, already approved in Fermi Cycle 6 and 9, to reveal the nature of all the blazar candidates of uncertain type (BCUs) associated in the Third Fermi-LAT catalog and all the blazar-like objects, potential counterparts of the unidentified gamma-ray sources (UGSs), selected according to our methods based on the IR colors. Our legacy project is crucial to prepare the future releases of the Fermi catalogs and to improve our knowledge of the blazar population. |

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| 101073 | CENKO | AFTERGLOWS, REDSHIFTS, AND ENERGETICS OF FERMI-LAT GAMMA-RAY BURSTS | 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, X-ray, 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). |
| 101083 | CAMP | SEARCH FOR ORBIT MODULATED EM EMISSION FROM INSPIRALING NEUTRON STARS WITH GBM AND LIGO | We propose a multiwavelength analysis with GBM and LIGO, to search for coincident gamma-ray and gravitational wave signals from a (NS-NS) or (NS-BH) inspiral. We will search with GBM for a distinct time signature of gamma-ray emission from a NS, caused by modulation of the light by the orbital motion of the binary inspiral. The modulation is due to a focusing of the light from two effects: gravitational lensing when the emitting NS is aligned with the companion, and beaming due to relativistic motion when the NS is moving towards the observer. This modulation is a general feature of the orbital motion and will be impressed on any source of gamma-ray emission from the NS during the inspiral. Thus we will open a new direction of investigation of EM follow-up of gravitational waves. |
| 101095 | RAY | LAT OBSERVATIONS OF THE PERIASTRON PASSAGES OF PSR J2032+4127 AND PSR B1259-63 | We propose to maximize the scientific return of the Fermi LAT observations of the once-in-a-lifetime periastron passage of the 48-year gamma-ray binary system PSR J2032+4127/MT91 213, while ensuring good coverage of the third periastron passage of the 3.4-year gamma-ray binary PSR B1259-63, whose gamma-ray active periods may overlap. This will be done via carefully pre-planned pointed and modified survey observations and a pipelined LAT data processing to keep track of the phase-averaged and off-pulse LAT flux, allowing rapid response to changes in the source state. |
| 101132 | ZHANG | PROBING BLAZAR MAGNETIZATION AND MAGNETIC FIELD EVOLUTION WITH MHD STUDY OF MULTI-WAVELENGTH POLARIZED VARIABILITY | Strongly variable polarized emission during multi-wavelength blazar flares indicates that the magnetic field is actively evolving during blazar outbursts, urging for a self-consistent study of the spectrum, multi-wavelength light curves, and polarization signatures altogether. We have developed a full 3D numerical toolset that integrates MHD, particle evolution, and polarized radiation transfer, which is able to simultaneously and self-consistently study the multi-wavelength polarized variability on the basis of first principles. We propose to use our toolset to study outburst events of flat-spectrum-radio quasars and BL Lac objects, in order to diagnose their magnetic field evolution and magnetization of both FSRQs and BL Lacs, as well as to examine their potential differences. |

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| 101134 | ERICKCEK | USING FERMI DARK MATTER ANNIHILATION CONSTRAINTS TO PROBE THE EARLY UNIVERSE | The Universe s evolution before Big Bang Nucleosynthesis (BBN) is unknown. Dark matter microhalos provide a window into this period because their seed fluctuations begin to grow prior to BBN. Consequently, an early matter-dominated epoch dramatically enhances the microhalo abundance within dwarf spheroidal galaxies (dSphs) and significantly boosts the dark matter annihilation rate within these systems. Since the microhalos track the density of the host halo, the morphology of this signal is extremely diffuse, and existing dSph constraints cannot constrain these models. We propose to significantly enhance the joint likelihood analysis of Fermi-LAT dSph observations to detect or constrain dark matter annihilation signals in cosmologies that include an early matter-dominated epoch. |
| 101140 | BRIGGS | A BLIND SEARCH FOR UNTRIGGERED SHORT GRBS IN THE CONTINUOUS DATA OF FERMI GBM | Short gamma-ray bursts (sGRBs) are of increased interest as they likely originate from NS-NS or NS-BH mergers, events which can also produce detectable gravitational waves. Fermi GBM is an excellent instrument for sGRBs, due to wide its wide field of view, high uptime and energy range. We have developed a blind search of the GBM Continuous Time Tagged Event data that is finding ≈80 likely sGRBs per year, in addition to the ≈40 on-board sGRB triggers. This search runs automatically, shortly after the GBM data becomes available. We propose to improve this search to test for signals in multiple detectors, including the BGO detectors, to enhance the GBM sGRB detection rate. The results will be disseminated as GCN notices, enabling multi-wavelength / multi-messenger followups. |
| 101145 | KAUR | HUNTING HIGH-REDSHIFT BL LACERTAE OBJECTS | We will perform 10-filter photometry, using Swift and SARA-CT, with the goal of measuring photometric redshifts for the Fermi BL Lacs (unknown z) visible from Chile. SARA+UVOT coupling allows us to determine accurate photo-z in the 1.3--8.0 range. We will target 60 objects and expect to find ~6 of them at z>1.3 thus increasing the current sample size of 24 such sources by 25%. 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 high-quality nIR-to-UV data that will be released to the general public. |

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| 101155 | THOMPSON | OPTIMIZING FERMI LAT TARGET OF OPPORTUNITY REQUESTS TO SWIFT FOR FLARING SOURCES | The survey mode, large field of view, improved angular resolution and high sensitivity of the Fermi Large Area Telescope represents an optimal hunter for high-energy flares, transients, and discovery of high-energy sources. The Swift satellite has the unique ability to quickly respond to Fermi LAT transient sources, to bright flares, hard states, and to alerts for new sources, combined with broad energy coverage. Swift is therefore the ideal companion of Fermi, allowing us to collect measurements of the flaring and variable sky. This proposal aims to optimize future TOO requests from Fermi to Swift by carrying out a retrospective of Fermi LAT flaring sources, with the goal of developing guidelines for when a TOO request is most ikely to be fruitful. |
| 101159 | LINFORD | IMAGING THE MULTIPLE OUTFLOWS LEADING TO SHOCKS IN CLASSICAL NOVAE | We request 18 hours of time on the Karl G. Janksy Very Large Array (VLA) to image the expanding ejecta of 3 Fermi-detected novae: V5668 Sgr, V5855 Sgr, and ASASSN-16ma. The VLA observations will take place during the next A-configuration (March to June 2018). These observations will bring the total number of Fermi-detected novae with resolved radio images to 5. The images will test our two-outflow model of nova eruptions based on radio observations of V959 Mon (Chomiuk et al. 2014, Nature). Combining the radio observations with ejecta velocity measurements from optical spectroscopy will enable us to estimate distances to the novae with expansion parallax techniques. Accurate distances are essential to understanding the total energy budget of these enigmatic sources. |
| 101160 | TROJA | RAPID FOLLOW-UP OF FERMI LAT GAMMA-RAY BURSTS | GRBs with high-energy emission opened up 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. |
| 101170 | KAZANAS | PROBING THE EBL WITH PAIR-HALO FERMI DATA | We propose a search for pair haloes in the {\em Fermi} data associated with {\em Fermi}--non-detected FRI and FRII radio galaxies thought to represent misaligned blazars; this choice is made so that the much brighter AGN gamma ray emission do not outshine that of the pair halo. The pair haloes are the product of the blazar gamma rays at energies >~ TeV which pair-produce with IR photons of the EBL. We plan to `stack' existing LAT data along the direction of radio lobes of a number of radio galaxies at judiciously chosen redshifts, such that the pair halo angular size be of order of or slightly larger than the Fermi PSF to optimize our S/N ratio. A positive outcome will provide novel insights into the gamma-ray blazar emission and the EBL reshift distribution. |

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| 101180 | WOOLF | DETERMINING THE ACCELERATED 3HE/4HE ABUNDANCE USING FERMI/GBM SOLAR FLARE DATA | Ackermann et al. (2012) reported on a weak M2 class flare that was observed by Fermi GBM on 2010 June 12. The results from their analysis showed the e-/e+ annihilation line at 0.511 MeV, the neutron capture line at 2.2 MeV, and nuclear deexcitation lines extending up to 7 MeV. These nuclear deexcitation lines were used to constrain the accelerated ion spectrum. Other larger flares have been observed by Fermi GBM between 2011 and 2014 that have not yet been thoroughly analyzed or reported in the literature. Under this proposal we will analyze these large flares known to have hard X-ray emission (>100 keV) observed by Fermi GBM to determine specifically the accelerated 3He/4He abundance, along with analyses of the e-/e+ annihilation line, the neutron capture line and deexcitation lines. |
| 101182 | OMODEI | OPTIMIZING THE SEARCH FOR ELECTROMAGNETIC COUNTERPARTS TO GRAVITATIONAL-WAVE CANDIDATES WITH THE FERMI-LAT | As the new era of Gravitational Wave (GW) astronomy begins, it is of fundamental importance to optimize the searches for Electromagnetic (EM) Counterpart of GW events. Fermi will likely be the first instrument to detect an EM signal associated to a GW event, especially because of the possible GW signal from compact objects associated to short Gamma-Ray Bursts progenitors. Even in this scenario, a multiwavelength campaign based on the localization estimated by Fermi is needed to fully unveil the characteristic of the source, possibly estimating its redshift. We propose to implement automatic follow-up analysis of LAT data aimed to reduce any human induced latency. The scientific outcome of this program is potentially tied to one of the biggest discovery of our century. |
| 101183 | DESAI | GRBS AS COSMIC PROBES OF THE UV AND OPTICAL BACKGROUND | The extragalactic background light (EBL) represents the cumulative light produced by cosmic star formation, SF(z), and the compact object accretion, modified by dust reprocessing in galaxies. The EBL thus represents a valuable measure of structure formation, and the determination of its intensity as a function of redshift advances several aspects of observational cosmology. Photon-photon pair creation offers a tool for such a determination, and Fermi has recently detected this attenuation in the spectra of blazars to z <1.6, allowing selection of realistic EBL models. We propose to confirm this detection with independent data (LAT GRBs with known z), and to extend it to z>4, where models are still very uncertain. Preliminary studies using Pass 8 indicate that we will be able to accomplish |

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| 101192 | FALCONE | SYSTEMATIC SEARCH FOR X-RAY COUNTERPARTS OF FERMI-LAT UNASSOCIATED SOURCES USING SWIFT: NEW BLAZARS, PULSARS, AND MORE | We propose to use Swift to search for X-ray and UV/optical counterparts of unassociated 3FHL and 3FGL Fermi-LAT sources. Prior programs led to Swift observations of 261, 199, & 385 Fermi unassociated sources from the 1,2, & 3FGL catalogs respectively. Possible x-ray counterparts are found in ~1/3 of these. We propose 225 new observations (71 from high energy 3FHL). These new data will determine the properties (with ~5 arcsec positions) of all detected X-ray sources in the LAT regions, contributing to identification, classification, and follow-up. This proposal supports the large analysis and interpretation task, which will require additional data reduction software. The Swift PI and Exec Committee commit to the Swift observing time. Reduced data will be made publicly available to everyone. |
| 101194 | JOSHI | THE UNPRECEDENTED RECENT OUTBURSTS OF FERMI BLAZARS | We propose to decipher the unprecedented recent flaring events of two blazars CTA 102 and OJ 287 using a time-dependent multi-zone leptonic jet model with radiation feedback (MUZORF). MUZORF invokes an internal shock scenario to energize the leptonic population and includes the geometry of the magnetic field in the jet to simulate the various radiative processes. The model will be modified to include the dynamic evolution of the ratio of ordered to disordered magnetic field and the radio emission calculation in order to reproduce the unprecedented flaring event of these two blazars and explore the cross-correlation across various wavebands observed for that time period. |
| 101212 | LINDEN | NOVEL DIFFUSE EMISSION MODELS FOR THE CENTRAL MOLECULAR ZONE | The origin of the galactic center gamma-ray excess stands among the key questions of the Fermi era. A critical uncertainty is the intensity and morphology of the diffuse astrophysical emission powered by the intense star-formation observed in the central molecular zone (CMZ). Our recent work has significantly improved existing diffuse emission models by including a cosmic-ray injection component that traces the molecular clouds in the CMZ. We will build upon these successes by integrating state-of-the-art 3D models of CMZ molecular clouds with high resolution cosmic-ray propagation simulations of the galactic center. This research will significantly advance our understanding of the dynamics of the CMZ and will produce high-fidelity models of the galactic center excess. |
| 101221 | JENKE | GBM EARTH OCCULTATION MONITORING | We propose to use software developed for Fermi/GBM Earth occultation analysis to continue to monitor a catalog of sources, providing automatically updated light curves (plots, ASCII files, and FITS files) and energy spectra for select sources as a service to the community via our website and FITS files via the FSSC. We propose to continually enhance our website in response to the scientific community's needs as exposure to our website increases beyond the X-ray community. |

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| 101225 | BIRD | SEARCHING FOR A COUNTERPART TO TEV J2032+4130, TESTING THE GAMMA-RAY BINARY NATURE OF PSR J2032+4127/MT91 213. | TeV J2032+4130 is an extended, very high energy (VHE, E > 100 GeV) gamma-ray source and was the first unidentified VHE gamma-ray source. After thirteen years of observations it remains unidentified with the most promising potential association the pulsar wind nebula of PSR J2032+4127. This has recently been identified as the compact object in a binary system with a highly eccentric orbit and a period of 45-50 years. With periastron due to occur in November 2017 this presents a unique opportunity to potentially identify the origin of TeV J2032+4130. We propose coordinate observations with VERITAS to search for VHE emission associated with periastron and compare that with Fermi-LAT and Swift observations to explore the phase dependent relationships between the wavebands. |
| 101232 | VENTERS | MODELING PARTICLE INTERACTIONS IN STARBURST GALAXIES -- CONSTRAINTS FROM KEV TO TEV | The mechanism for producing GeV emission in star-forming galaxies is difficult to determine from Fermi data alone, particularly for galaxies with especially high amounts of star formation. Our proposal focuses on broadband spectral modeling of the nearby starburst galaxies NGC 253 and M82, which have both been detected by the Fermi-LAT and by TeV telescopes. NuSTAR observations of these two systems offer a first opportunity to robustly identify and measure diffuse emission of starbursts in the hard X-ray band (10--30 keV). Our goal is to combine gamma-ray and hard X-ray constraints on non-thermal emission to better distinguish the emission processes responsible for the observed gamma-ray signals, specifically to evaluate the roles of hadronic and leptonic interactions. |
| 101237 | VIANELLO | THE LAT TRANSIENT FACTORY. UNVEILING THE NATURE OF LAT GRBS AND SHORT-DURATION TRANSIENTS. | We will perform a time-resolved, detailed spectral analysis of all joint GBM/LAT GRBs detected by the LAT Transient Factory (LTF) triggered search (LTF-t). We will use the results of this unprecedented characterization of the prompt high-energy emission from GRBs to constrain physical models of GRBs. We will also characterize the transients of unknown origin found by the blind search of the LTF (LTF-b) by cross-correlating them with existing catalogs (Swift/XRT, Swift/UVOT, BZCAT...). We will extend the LTF-b to energies < 100 MeV, a region which is not explored by existing blind searches (ASP, FAVA). We will also develop a pipeline to run LTF-b in real time, which will allow the prompt dissemination of discovered transients for a quick multi-wavelength follow up. |

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| 101238 | TIMOKHIN | LOOKING DOWN THE BARREL OF THE GUN: OBSERVATIONAL SIGNATURES OF PULSAR POLAR CAPS. | We propose to provide theoretical predictions for testing of one of the most fundamental assumptions of all modern pulsar theories - pair plasma generation in the polar caps - against Fermi data. Previous studies of polar cap cascades relied on the assumption of stationarity of plasma flow which has recently been proven to be incorrect. We will use modern self-consistent models of polar cap cascades to simulate pair creation and gamma-ray emission accompanying plasma generation in polar caps. We will predict the light curves, luminosities, and spectra which can be compared with Fermi data to put stringent limits on pulsar models. |
| 101245 | BUSON | INTRINSIC GAMMA-RAY ABSORPTION FSRQS: PROBING THE SITE OF GAMMA-RAY EMISSION IN BLAZAR JETS | Gamma rays produced in blazars are subject to several interactions, both intrinsic and extrinsic to the objects themselves. In particular, if they are produced close to the black hole, they may annihilate with broad line region (BLR) photons. The gamma-ray spectra of flat spectrum radio quasars (FSRQs) may inform an observer about these interactions. We discuss encouraging preliminary results and propose to use our diagnostic to study the gamma-ray spectra of around 40 of the brightest LAT FSRQs. Pinpointing the signatures of gamma-gamma absorption with BLR photons will allow us to derive important constrains on the location of the gamma-ray emitting region and deliver unique, valuable information on the BLR physics. |
| 101250 | 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 unassociated Fermi sources. Intriguing systems have already been found, including candidate transitional millisecond pulsars and a new subclass of pulsar binaries with red giant companions. Our guaranteed telescope time and regular observing cadence constitute a unique opportunity to add value to the Fermi mission through ground-based correlative observations. |
| 101255 | MALKAN | NEWLY DISCOVERED IONIZING PHOTONS AND THE GAMMA RAY OPACITY OF THE UNIVERSE | Previous calculations of the cosmic gamma ray opacities have typically neglected the flux of photons beyond the Lyman limit due observational challenges in determining them. Our new work has identified the rapidly evolving population of small but numerous galaxies which dominate the diffuse cosmic background at lambda < 91.2nm. We find that more far-UV, and especially extreme UV, photons from these extreme emission-line galaxies leak into the IGM. This increases the high-redshift opacity for gamma rays at energies below 150 GeV. We will revise the opacity calculations, and then compare them with FERMI observations of high redshift objects out to z ~ 4.3. By combining the resulting constraints from FERMI data, we will determine the population of galaxies that re-ionized the Universe. |

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| 101261 | VIEIRA | HUNTING THE UNIDENTIFIED FERMI SOURCES WITH THE SOUTH POLE TELESCOPE | Currently, 35% of extragalactic Fermi sources are unidentified. The South Pole Telescope (SPT) has surveyed 2500 square degrees of the southern extragalactic sky at mm-wavelengths with arcminute resolution. Roughly 5000 blazars are detected at high significance in the maps, providing a powerful, complete, and unbiased tool to identify unidentified Fermi sources. We have conducted a preliminary study with SPT survey data and find we can robustly identify 74% of the previously unidentified Fermi sources within our survey area. We propose to finalize this analysis and prepare forecasts for the next generation of CMB experiments, which will extend this technique across the entire sky with even greater sensitivity. |
| 101263 | KALAPOTHARAKOS | UNDERSTANDING THE PULSAR GAMMA-RAY EMISSION | Our studies have shown that Fermi data guide the modeling of the pulsar gamma-ray emission. Our 3D macroscopic and kinetic PIC global models reproduce the broader spectrum of the Fermi pulsar phenomenology. Our PIC models provide viable configurations but because they so far use an ad-hoc uniform particle injection they are unphysical. Therefore, we propose to study the role of the various regions of pair-creation in the development of the solutions that reproduce the observed gamma-ray light-curves and spectra. Moreover, we propose to model the particle injection on a physical basis which will eventually lead to fully self-consistent models. These improvements have the prospects to lead to a complete physical picture that will deepen our understanding about the pulsar gamma-ray emission. |
| 101264 | PETER | REVEALING THE SUN S CORONAL MAGNETIC FIELDS WITH GAMMA RAYS | Magnetic fields in the Sun s corona are poorly understood. Fermi-LAT sees the Sun s disk as a bright, time-varying source of gamma-rays, a result of hadronic Galactic cosmic-ray (CR) interactions with the Sun. The best models of this emission, which omit a complete treatment of the corona, predict a gamma-ray flux an order of magnitude smaller, and less variable, than observed by LAT. We propose a coordinated theoretical and observational program reveal coronal magnetic fields with solar gamma rays. (1)We will incorporate a range of coronal models in our current theoretical model of CR interactions in the Sun. (2)We will conduct new analyses of Pass 8 data to reveal the spatial distribution of gamma-rays as throughout the solar cycle. Combined, we will distinguish among coronal models. |
| 101268 | MAJID | TESTING MILLISECOND PULSAR INTERPRETATION OF THE GALACTIC CENTER GAMMA-RAY EXCESS | Over the past few years, a number of groups using data from the Fermi LAT instrument have identified excess gamma-ray flux toward the inner one degree of the Galactic Center. One possible source of this excess is suggested to be a population of millisecond pulsars (MSP). The goal of this project is to constrain the MSP population in this region of the galaxy by carrying out a sensitive search for MSPs at high radio frequencies. |

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| 101270 | VERES | IS THERE A RELATION BETWEEN PROMPT GRB POLARIZATION AND SPECTRAL PARAMETERS? ANSWERS FROM FERMI-GBM AND ASTROSAT | The CZTI instrument aboard Astrosat measures the degree of polarization of gamma-ray bursts (GRBs) in a narrow energy range (100-300 keV). Spectral information, which is a crucial component in determining the source of polarization, is readily proved by Fermi GBM. Polarization data without spectral information cannot discriminate between models. We propose to distinguish between prompt emission polarization models based on the polarization data available from Astrosat together with spectral measurements by Fermi GBM, underlining the complementary nature of this project. We demonstrate the feasibility of our method through GRB 160802A, with joint Astrosat-GBM observations. |
| 101271 | KASSIM | TARGETING MILLISECOND PULSARS THROUGH RADIO IMAGING OF FERMI UNIDENTIFIED GALACTIC BULGE SOURCES | We propose an efficient strategy to uncover the putative pulsar population powering the Galactic bulge gamma-ray excess. Our hybrid approach uses low frequency imaging toward Fermi unidentified sources with pulsar-like spectra to identify compact, steep-spectrum radio candidates. Once localized, higher frequency pulsation searches can proceed where scattering effects are reduced. Our approach is complementary to other strategies since it allows us to look in close toward the Galactic Plane where other methods cannot due to high levels of scattering. This hybrid technique of imaging followed by pulsation searches has resulted in six new MSP detections over the last 6 months. Our proposal requests 12.5 hours of VLA time to image a sample of 17 Fermi unassociated Galactic bulge sources. |
| 101275 | CASTRO | CHARACTERIZING THE GAMMA-RAY EMISSION FROM PULSAR WIND NEBULAE WITH THE FERMI-LAT | Pulsar wind nebulae (PWNe) studies provide us with information on particle acceleration mechanisms at relativistic shocks, on the evolution of the pulsar spin down and, at later phases, on the ambient interstellar gas. While the basic understanding of PWNe has been developed, we still lack detailed knowledge about the characteristics of the relativistic particle populations in these systems. Moreover, the evolution of PWNe under different conditions and how that is reflected in their high-energy gamma-ray emission is yet to be well determined. To answer these outstanding questions, we propose to carry out a systematic search and spectral characterization of PWNe around all \fermi\ detected pulsars and nebulae observed in other wavelengths. |
| 101279 | BRIGGS | DISTINGUISHING BETWEEN TERRESTRIAL GAMMA-RAY FLASH (TGF) PRODUCTION MODELS USING FERMI GBM | We will fit the spectra of individual TGFs observed with the Fermi Gamma-ray Burst Monitor using two models for where the electrons are accelerated: in large-scale electric field regions or in localized high-field regions at the tips of lightning leaders. These two models predict intrinsic differences in the spectra and differences in the beam widths, which cause differences in the spectra at some offsets from the source. The spectral fitting results will be used to distinguish between the two models for where the electrons that produce TGFs are accelerated to relativistic energies. |

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| 101280 | KOUVELIOTOU | MAGNETAR OBSERVATIONS WITH THE FERMI/GAMMA RAY BURST MONITOR | Since 2008 we detected 11 magnetars (discovered 2); produced the 5-year GBM magnetar burst catalog; observed the smallest hot spot on a NS surface;found SGR-like bursts from a low B-field NS; revealed new trends in the burst Ep vs flux correlations; estimated the maximum extent of magnetar atmospheres to be 10m; established that 2 BBs fit burst spectra best; discovered QPOs in magnetar bursts. These results are reported in 25 papers and multiple meetings. In the next 2 years we will probe the differences between AXP and SGR bursts; perform burst morphological studies; continue magnetar seismology; monitor known and discover new sources and study the magnetar population; produce a public web-based magnetar burst catalog; combine GBM with NuSTAR, LOFAR, MWA, aLIGO; detect a new Giant Flare. |
| 101287 | MARCHESI | FULL 3D MAPPING AND IDENTIFICATION OF THE >10 GEV EXTRAGALACTIC SKY | The newly developed 3FHL catalog, the largest catalog of sources detected at >10 GeV, represents the deepest look at the very high energy sky and it will remain unrivaled for years to come. However, at the present day the catalog spectroscopic completeness is rather low (~42.5% of ~1500 sources), therefore limiting its scientific applications. Following the Fermi-NOAO Cooperative Arrangement guidelines, we propose CTIO and KPNO spectroscopic follow-ups of 151 3FHL unclassified objects. These sources are either blazar candidates of uncertain type (BCUs) or unknown objects with bright X-ray counterparts. Characterising a significant part of 3FHL sources, this legacy project will both improve our knowledge of the blazar population and prepare the ground for future facilities, such as CTA. |
| 101290 | MUKAI | FERMI TOO OBSERVATIONS OF BRIGHT GALACTIC NOVAE | Ten Galactic novae have been detected as transient GeV gamma-ray sources with the Fermi LAT. This demonstrates the complexity of the mass ejection process in novae, and the importance of shocks between different components of the ejecta. This discovery has also added a new class of objects in which particle acceleration can be studied, one in which the shock velocities are modest and the densities are high compared to other cases. We are just beginning to explore the diversity of gamma-ray properties among novae, however. Further progress depends on discovery of more LAT-detected novae backed up by multi-wavelength observations. We therefore propose Fermi TOO (pointed) observations of new bright novae that are discovered during the Cycle 10 period. |