prop_num	pi_fname	pi_lname	Title	Abstract
161001	BRIAN	METZGER	MODELING THE SHOCK-POWERED GAMMA-RAY EMISSION IN SYMBIOTIC NOVAE	The discovery by Fermi LAT of gamma-rays from novae illustrates that shocks and high energy particle acceleration are common in nova outflows. The recent discovery of ~TeV emission by HESS and MAGIC from the symbiotic nova RS Oph demonstrates acceleration up to >10 TeV can occur. We will perform 3D hydrodynamical simulations with radiative cooling of the interaction of the time-variable nova outflow with the circumbinary medium (CBM). Using a physically-motivated prescription for shock magnetic field amplification, we will calculate the time-dependent spectrum of the accelerated particles and their associated non-thermal emissions. Particular focus will be placed on understanding the origin of the several day delay between the peak of the GeV and TeV light curves in RS Oph.
161010	HAOCHENG	ZHANG	BLAZAR GAMMA-RAY AND MULTI-WAVELENGTH PATTERNS FROM 3D TURBULENCE SIMULATIONS	Orphan gamma-ray flares from blazars observed by Fermi suggest that the emission region is inhomogeneous and/or anisotropic. It is further evident by the power-law shaped PSD often found in Fermi gamma-ray light curves, indicating both large- and small-scale variations in the emission region. We propose to explore blazar gamma-ray and multi-wavelength signatures via combined 3D PIC and radiation transfer simulations of turbulence. We aim to answer three questions with a comprehensive parameter study: Do gamma-ray light curves from turbulence follow a power-law PSD? Can turbulence drive orphan gamma-ray flares? What turbulence parameters determine the multi-wavelength signatures, such as the average variability time scales, flare amplitudes, and optical polarization degrees?

161011	ERIC	BAXTER	DECIPHERING THE DIFFUSE GAMMA-RAY SKY WITH SIMULATION BASED INFERENCE	We propose to apply the statistical methods of simulation based inference (SBI) to Fermi Large Area Telescope (LAT) data to constrain contributions to the diffuse gamma-ray background (DGRB). SBI methods are very well suited to analysis of the DGRB since they enable multiple forms of information in the data (e.g. photon count statistics, energy information, spatial variations) to be harnessed, and because they allow important observational effects (e.g. energy-dependent point spread function and spatially varying exposure) to be correctly incorporated into the analysis. We will develop a multi-purpose tool for applying SBI to LAT data and will use this tool to constrain contributions from active galactic nuclei, star forming galaxies, and annihilating dark matter to the DGRB.
161013	SVETLANA	JORSTAD	PROBING MAGNETIC FIELDS OF GAMMA-RAY AGN	We propose to monitor 4-band (BVRI) optical linear polarization and flux of 55 gamma-ray AGN 8-10 nights per month at a ~2m telescope to build a database of polarization behavior during quiescent and flaring gamma-ray states. We will construct gamma-ray and optical light curves and polarization curves to search for correlations between gamma-ray and optical flux, polarization, and spectral index variations. The polarization will reveal magnetic field properties in optical emission regions at different gamma-ray activity states. New sources will be added to the sample based on Fermi, VHE, and neutrino alerts. The data set will lead to important insights into particle acceleration mechanisms, locations of gamma-ray emission sites, and magnetic field structures in AGN.

161014	TROY	PORTER	SEARCH FOR SIGNATURES OF RECENT COSMIC RAY ACCELERATION IN THE OUTER MILKY WAY	The objective of this proposal is to use observations of gamma rays in the energy range 1 GeV to 1 TeV to search for signatures of recent cosmic ray acceleration and propagation towards the outer Milky Way. We will use Gaussian Processes, a stochastic modeling technique, to detect and characterize the low surface brightness features that are the likely evidence for such activity. Our proposed study will extend a successful previous search at high latitudes using the same method into the outer Galactic plane, where there is a higher density of CR sources and as such finding additional evidence for the recent CR injection and propagation activity is more likely. The results from this study can be used to resolve the so-called CR gradient problem that has been acknowledged for over 30 years.
161019	ALAN	MARSCHER	VLBA MONITORING OF GAMMA-RAY BRIGHT BLAZARS AT 7 MM *(large project)*	The investigators propose to monitor the jets of 35 radio and gamma-ray bright active galactic nuclei with monthly 7 mm VLBA total and polarized intensity images. Primary goals are to (1) relate events (variations in flux, new emission knots, changes in linear polarization and apparent speed) seen in the images of compact jets of blazars that are responsible for gamma-ray as well as mm-wave, optical, and X-ray variability; (2) match linear polarization of features in the jet with that at higher frequencies (including X-rays); and (3) relate events in the jet with very high-energy (>200 TeV) neutrino detections to infer the location of the neutrino production. Physical parameters derived from the data are crucial for modeling high-energy emission from blazars.

161026	PABLO	SAZ PARKINSON	UNVEILING THE PHYSICS OF PULSAR GLITCHES WITH JOINT ANALYSIS OF GAMMA RAYS AND GRAVITATIONAL WAVES	Most young, energetic pulsars exhibit glitches, sudden changes in timing behavior. Despite various proposed models (e.g. starquakes, superfluid motions), a clear understanding of glitches is still missing. Glitches are thought to trigger oscillation modes that could produce gravitational waves. We propose a systematic search for gravitational waves coincident with LAT pulsar glitches, using publicly available LIGO/Virgo data. LAT pulsars are optimal targets for glitch searches due to their energetics and glitch magnitudes. Furthermore, over half of LAT glitching pulsars are radio-quiet, making Fermi the only instrument capable of timing them. This will be the first comprehensive study of gamma-ray pulsar glitches, highlighting the key role of Fermi in multi-messenger science.
161029	NICOLA	OMODEI	FERMIPY A LEGACY TOOL FOR THE FERMI MISSION *(large Project)*	With this proposal we seek support for the enhancement of the fermipy package, a reference tool for analyzing Fermi LAT data wildly used by the entire community. We have highlighted important areas that require development: support catalog style analysis and its extension to full-sky to study the diffuse emission; improve the light curve module to study short duration transients using an un-binned likelihood approach; enhance the stacking module, extending it to N-d likelihood profiles; provide and maintain the compatibility with the ThreeML software via the fermipy plugin, which will ultimately allow Fermi LAT data to be jointly fitted with data from other instruments. In summary, this proposal will guarantee stable development and maintenance of fermipy for the next three years.

161045	MARCO	AJELLO	THE EVOLUTION OF BLAZARS ACROSS COSMIC TIME	The cosmic evolution of blazars, the most luminous persistent sources in the Universe, is an important observable to understand the growth of this population and their contribution to the extragalactic gamma-ray background (EGB). Yet both remain rather undetermined. This proposal will rely on the largest dataset on blazars provided by the Fermi-Large Area Telescope to precisely measure the cosmic evolution of these sources. This program will determine the type of evolution for FSRQs and BL Lacs and whether there is a genetic link between them. Moreover, it will measure the contribution of blazars to the EGB.
161046	DANIEL	KOCEVSKI	THE GBM TARGETED SEARCH FOR COUNTERPARTS TO GRAVITATIONAL WAVE DETECTIONS	We propose to perform a comprehensive follow-up campaign of Fermi GBM data to search for additional counterparts to gravitational wave events detected in the upcoming fourth observing run (O4). The O4 run will benefit from a number of upgrades to the LIGO and Virgo detectors that will substantially increase the expected number of BNS alerts compared to previous runs. We will use the unique capabilities of the GBM sub-threshold search techniques to look for coincident gamma-ray emission associated with both public and "sub-threshold" gravitational wave candidates provided by the LIGO/Virgo/KAGRA Scientific Collaborations.
161048	FRANK	SCHINZEL	SEARCHING FOR A MISSED POPULATION OF GAMMA-RAY SOURCES	A peculiar subset of unassociated g-ray sources (UAS) found in the Galactic plane have no cataloged radio point source within their localization, also referred to as 'empty fields'. This population of g-ray sources has been largely resisting traditional association methods that were applied over the past decade. Here we propose to map and classify low surface brightness radio emission in a large sample of empty fields with the primary goal to better understand soft UGS, first discussed in 4FGL-DR3. The aim is to better understand the dense regions in the Galactic plane, their significance to cosmic ray acceleration, and to investigate the presence of an overlooked class of Galactic g-ray emitter. The results of this work will also benefit to optimize e.g. radio and g-ray pulsar searches.

161057	BAGRAT	MAILYAN	SPECTRAL ANALYSES OF FERMI-GBM TERRESTRIAL GAMMA-RAY FLASHES AND ELECTRON BEAMS	Spectral analyses of individual TGFs are challenging even for bright events. Recently, it was shown that Terrestrial Electron Beams (TEBs) produced by the TGFs, which are electron and positron fluxes originated in the Earth's atmosphere, can be used to constrain TGF production models. Surprisingly, "nusiance" parameters such as radial distance from the source, beam opening and tilt angles, and source altitude are relatively unimportant to TEB spectra so that TEB spectra can more directly constrain the TGF acceleration mechanism. Despite TEBs being infrequently observed due to their narrow beams, Fermi-GBM has already observed 20 bright TEBs. We will use Relativistic Feedback Discharge and lightning leader models to fit the TEB spectra and choose the best fit models.
161062	SIMONA	MURGIA	MODELING THE GALACTIC GAMMA-RAY EMISSION WITH DEEP LEARNING	We propose a methodology to reliably model the small-scale gas structure in the Galaxy, with focus on molecular hydrogen gas, thus providing the foundations for more robust interstellar emission models for the determination and characterization of point-sources as well as extended sources in the Fermi LAT data since the impact of these features is likely significant. We harness available data for molecular gas proxies better suited to trace this small scale features. However, these data are only available in very limited regions of the sky. We address this issue by exploiting machine learning to predict this emission where observations of these proxies do not exist.
161063	YONG	SHENG	PHOTOMETRIC REDSHIFTS FOR FERMI BL LACS	We will perform 10-filter photometry, using Swift and SARA-RM, with the goal of measuring photometric redshifts for the Fermi BL Lacs (with unknown z) visible from La Palma in Spain. SARA+UVOT coupling allows us to determine accurate photo-z in the 1.3--8.0 range. We will target 50 objects and expect to find ~5 of them at z>1.3, thus increasing the current photo-z sample size of 19 such sources by 37%. 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.

161071	NURIA	TORRES-ALBA	GAMMA-RAY EMISSION FROM PROTOSTELLAR JETS	Stars are formed through the accretion of matter onto a central protostar and, in the process, can launch supersonic jets. These then interact with the surrounding medium, which results in the formation of shocks and, therefore, particle acceleration. It has been proposed that these particles can then produce non-thermal emission, up to the gamma-ray range. Here, we propose to study a sample of protostellar jets as possible counterparts to Fermi-LAT detected sources. We find 18 of these are coincident with unassociated 4FGL point sources. A preliminary analysis of their powerlaw index shows our sample is unlikely to belong to a previously-detected source population. This program will likely result in the establishment of a new source population detected for the first time in gamma-rays.
161072	SCOTT	JOFFRE	BRIDGING THE GAP: A SENSITIVE CATALOG OF MEV SOURCES	The under-explored MeV band has an extremely rich scientific potential. Awaiting an all-sky MeV mission, it is now the prime time to take full advantage of the capabilities of the Fermi Large Area Telescope to explore this regime. With more than 12 years of the best available dataset (Pass8), in this proposal we plan to develop an ad hoc all-sky analysis to build the most sensitive catalog of sources from 20 to 200 MeV. This will allow us to unveil the SED peak of most gamma-ray sources, fundamental to understand their nature, as well as discover a whole new population of MeV ones. Importantly, this program will start bridging the gap between the MeV and GeV energy bands, strongly supporting the scientific case for a future all-sky MeV mission and enhancing the legacy of the Fermi mission

161089	IAN	BLACKSTONE	DISRUPTION OF GIANT MOLECULAR CLOUDS BY COSMIC RAY PRESSURE: DYNAMICS AND GAMMA-RAY EMISSION	The investigators propose to construct a model of the disruption of giant molecular clouds (GMCs) around newly formed star clusters by cosmic ray (CR) pressure. While star clusters and GMCs have long been considered as the site for particle acceleration and non-thermal emission, such models have not been coupled dynamically to the disruption of the GMC itself. In this proposal, we explore the interplay between the dynamical importance of CRs for GMC disruption and the predicted gamma-ray emission. This 1 year project will map the available parameter space for the first time, and provide predictions for the gamma-ray emission from star clusters and their surrounding GMCs as a function of mass and age for comparison with observations from Fermi.
161090	JULIA	DENEVA	CONTINUED TIMING OF PULSARS FOUND IN JERK SEARCHES OF FERMI UNASSOCIATED SOURCES	The discovery of millisecond pulsars (MSPs) in radio searches of Fermi-LAT unidentified sources continues. In order to fulfill the promise of these discoveries, we must obtain phase-coherent rotational ephemerides over at least one year. These are then used to fold sparse photons and obtain gamma-ray pulsations, the starting point for subsequent studies. We plan to use the GBT telescope to obtain timing solutions for 10 MSPs we have discovered in unassociated LAT sources. Our work will determine if the new MSPs are associated with the Fermi sources, contribute to future Fermi Pulsar Catalogs, magnetospheric geometry studies and multi-wavelength pulsar emission models, and evaluating the MSPs for inclusion in pulsar timing arrays for the detection of gravitational waves.

161091	SCOTT	JOFFRE	STUDYING THE ORIGIN OF HISTORICAL GALACTIC TRANSIENTS WITH FAVA	The Fermi All-sky Variability Analysis (FAVA) tool is a publicly available tool which detects gamma-ray flares. Assuming that the intensity of the diffuse gamma-ray emission is constant over year-long timescales, it statistically compares the measured rate in a given week with the rate evaluated over the entire Fermi-LAT mission. This tool does not rely on any Galactic diffuse models. We look to investigate all historical Galactic transients detected by FAVA at low latitudes in the hopes of studying the population of variable sources and the frequency of their flares within the Galaxy. Besides identifying the frequency of Galactic gamma-ray flares, we hope to establish associations to significant flares, and investigate flares that likely originate from new Galactic transient sources.
161092	MATTHEW	KERR	SEARCHING FOR FAST(ER) VARIABILITY IN GAMMA-RAY PULSARS	Radio pulsars exhibit a wide range of variability, including "mode changing", in which different emission states correspond to changes in the magnetosphere and spin-down rate. Such magnetospheric re-configuration is apparently widespread, yet of the nearly 300 gamma-ray pulsars detected by the Fermi LAT, only PSR J2021+4026 has been found to vary. This puzzling discrepancy may be because previous analyses are sensitive only on >1-year timescales. We therefore propose to search every gamma-ray pulsar for general types of variability on timescales down to 1 minute. We have developed three preliminary, general methods for detecting variability, and in a pilot study we find these methods are capable of detecting faint variability in most of the gamma-ray pulsar population.

161095	STEFANO	GIARRATANA	RADIO-BRIGHT VS RADIO-DARK: TESTING SUB-POPULATIONS IN LONG GRB AFTERGLOWS	It has been shown that only 31% of long Gamma-Ray Bursts (GRBs) have a detected radio afterglow: while some authors ascribed this detection rate to the sensitivity of radio facilities, others claimed that some GRBs may be intrinsically radio-dark, with deep implications on the progenitor nature and/or the microphysics of the afterglow. However, these results suffer from several systematic effects, as GRB samples are incomplete and non-uniform. We propose to build the first uniform sample of GRBs with gamma-ray and radio information: to do so, we require a VLA follow-up of up to 10 GRBs detected by Fermi/GBM and with a confirmed redshift. Are there radio-dark/bright GRBs? If so, is it due to a different progenitor? The proposed campaign is the first step to answer these question.
161097	ANDREI	BELOBORODOV	GAMMA-RAY PRECURSORS OF NEUTRON STAR MERGERS	More observations of neutron mergers are expected in the near future, with an exciting possibility of detecting the electromagnetic precursor emitted before the merger, when the two stars are still orbiting each other. Recent theoretical work shows that a detectable precursor should be produced if the neutron stars have strong magnetic fields, and that its emission peaks in the hard X-ray/soft gamma-ray band. The key needed theoretical investigation is the calculation of spectra and light curves expected in such precursors, which will provide templates to search in data. The proposed project focuses on this work, building on recent investigations of heating in binary magnetospheres and using state-of-the-art radiative codes for simulations of the precursor emission.
161098	DAMIANO	CAPRIOLI	INTERPRETING THE GAMMA-RAY EMISSION FROM NOVAE	Over the past decade, the Fermi satellite has revealed novae to be powerful gamma-ray sources capable of efficient particle acceleration. These gamma-rays are produced by relativistic ions and electrons accelerated by shocks between nova ejecta and circumstellar material. By combining a detailed model of particle acceleration with multi-wavelength (particularly gamma-ray) observations of novae, one can reveal the hydrodynamic evolution of a nova outburst. Moreover, the high occurrence rate (more than one per yr) and short evolutionary timescale (~ weeks) of novae provide a unique opportunity to study particle acceleration in real time.

161101	HENRIKE	FLEISCHHACK	MULTI-INSTRUMENT FITTING OF GEV-TEV GAMMA-RAY EMISSION FROM SHELL-TYPE SNR WITH THREEML	Supernova remnants (SNRs) are potential sources of Galactic cosmic rays. Their gamma-ray spectra reveal the limits of the acceleration mechanisms. We propose to perform multi-instrument joint likelihood fits to gamma-ray emission from SNRs, including data from the Fermi-LAT and the HAWC TeV gamma-ray observatory. Concentrating on GeV-emitting SNRs that are not detected by HAWC, we will look for breaks or cutoffs in the energy spectra, indicating the maximum energy up to which particles are accelerated in the SNRs in question. As a prerequisite to the SNR study, we will perform verification of Fermi-LAT data with the threeML framework for multi-instrument data analysis.
161103	DANIEL	KOCEVSKI	THE FERMI LAT LIGHT CURVE REPOSITORY	We propose to further develop and operate the Fermi LAT light curve repository (LCR), consisting of a public library of light curves for variable LAT sources on a variety of timescales. The LCR provides publication quality light curves on timescales of days, weeks, and months for over 1500 sources deemed variable in the 4FGL-DR2 catalog. We propose to continue developing the LCR by implementing an automated flare detection algorithm that would allow users to subscribe to alerts for particular sources via the Kafka-based General Coordinates Network (GCN). We also plan to add the 3rd LAT Pulsar Catalog (3PC) to the list of available data overlay, which would display the coordinates of LAT monitored pulsars and link to upcoming Pulsar Portal initiative to be hosted at the FSSC.

161107	JAMIE	KENNEA	IMPROVING THE LOCALIZATION OF FERMI/GBM GRBS WITH SWIFT/BAT EVENT DATA DURING THE LIGO/VIRGO/KAGRA O4 RUN	We seek to improve the localization of Fermi/GBM detected GRBs. Utilizing GBM alerts, Swift is commanded to dump BAT event data, usually discarded on board, to the ground. These data will be analyzed for evidence of a co-detection of the GRB by BAT. If detected, then we will utilize BAT data either to localize the GRB to ~arc-minute resolution (if within BAT FOV), or if outside the BAT coded FOV, combine information from GBM and BAT to significantly reduce the GBM error region. We estimate obtaining arc-minute localizations for 12-13 GBM GRBs per year, in addition to those co-detected by BAT, and many more will allow us to significantly reduce the GBM error region. This is vitally important for the upcoming O4 GW detector run which overlaps Fermi Cycle 16.
161108	XIN	LIU	HIGH-REDSHIFT FERMI BLAZARS: PROBES OF EARLY MASSIVE BLACK HOLE SEED FORMATION	Fermi-detected high-redshift (z>2.5) blazars are jetted AGNs thought to be powered by massive, rapidly spinning supermassive black holes (SMBHs) in the early universe (<2 Gyr). They provide a laboratory to study early black hole (BH) growth and super-Eddington accretion -- possibly responsible for the more rapid formation of jetted BHs. However, the existing virial BH masses of high-redshift blazars may be biased by strong outflows. We propose Gemini/GNIRS near-IR spectroscopy for eleven high-redshift Fermi blazars with multi-wavelength observations that maximally sample the spectral energy distributions (SEDs). The program will establish robust virial BH masses and Eddington ratio estimates for high-redshift Fermi blazars to test rapid early SMBH growth models.

161111	MATTHEW	KERR	FITTING EVERYTHING, EVERYWHERE, ALL AT ONCE	We will develop and publish a user-friendly tool that will enable a Fermi-LAT data analyst to simultaneously model discrete point sources, sub-threshold point sources, and diffuse emission. Only the former is currently possible. We will build on the Fermitools, which account for the LAT instrument response and exposure, by incorporating powerful new techniques from information field theory (IFT). We will improve on previous IFT-based work by modeling resolved point sources parametrically, allowing the analyst to infer their positions and spectral shapes. To keep the scope manageable, we will focus on the common use case of modeling a single region of interest (ROI), but note there is a natural path to all-sky analysis and next-generation source finding.
161113	WALID	MAJID	RESOLVING THE GALACTIC CENTER GAMMA-RAY EXCESS WITH MILLISECOND PULSAR OBSERVATIONS	The goal of this project is to test the millisecond pulsar (MSP) interpretation of the Galactic Center (GC) gamma-ray excess. A radio survey offers the most sensitive and efficient way to discover the MSP population in this region of the Galaxy. However, the strong scattering towards the GC means that radio surveys must be conducted at much higher frequencies than are typical of pulsar surveys in the Galactic field. A key missing component of designing such a sensitive survey is our knowledge of MSP flux densities at high radio frequencies. In this proposal, we will carry out sensitive high frequency observations of known MSPs in gamma-ray bright globular clusters that will be used to inform future GC surveys for MSPs.

161115	RODRIGO	NEMMEN	PROBING DWARF GALAXIES WITH MASSIVE BLACK HOLES USING GAMMA-RAYS	The gamma-ray properties of dwarf galaxies with massive black holes (MBHs) have remained largely unexplored. Thus, we must learn more about such a significant population's accretion and outflow habits. Do they accrete and launch jets just like their blazar and microquasar counterparts? We propose to search for gamma-rays of a sample of 164 nearby dwarf galaxies selected for the presence of indicators of accreting MBHs. We will also model the existing Fermi-LAT observations of AGN dwarves already significantly detected in gamma-rays to constrain their nature: are they due to MBH jets? Or are they produced by star-forming processes? Finally, we will obtain stacked spectral energy distributions and compare them with theoretical expectations.
161124	MALLORY	ROBERTS	SEARCHING FOR HIGHLY SCATTERED PULSARS IN LOW LATITUDE FERMI SOURCES	We propose to search 20 unidentified Fermi sources at low Galactic latitudes for highly scattered pulsars in the Northern sky. We request 2 hour observations of each source with the Green Bank Telescope using the S band receiver. We choose sources whose positional uncertainties in 4FGL-DR3 are well covered by the GBT Beam at 2GHz. Systematic uncertainties due to source confusion have previously prevented efficient searches at these higher frequencies.
161126	ASHKBIZ	DANEHKAR	TRACING THE HISTORY AND ORIGIN OF THE FERMI AND EROSITA BUBBLES USING TIME-DEPENDENT RHD SIMULATIONS	The Fermi-LAT observations have revealed two gamma-ray bilobular structures extending 9 kpc above and below the Galactic plane, the so-called Fermi bubbles, accompanied by X-ray emission based on eROSITA and microwave WMAP haze. Although their origin is still elusive, they could provide evidence for past extreme feedback from starbursts or the central supermassive black hole. We propose to investigate the formation of the Fermi and eROSITA bubbles, as well as the WMAP haze, using time-dependent 3D radiative hydrodynamic (RHD) simulations, including non-equilibrium photoionization and collisional ionization with time-evolving radiation and mechanical feedback. This work will have important implications for our understanding of the formation and evolution of these structures.

161129	BANAFSHEH	BEHESHTIPOUR	INVESTIGATING PHYSICS OF ACTIVE GALACTIC NUCLEI JETS USING THE FERMI AND TESS OBSERVATION	The ultimate goal of this proposal is to study the physics of the relativistic jets in AGNs by investigating AGNs flux variability. We propose to approach this goal by studying the variability at two different wavelenght of optical and gamma-ray. We combine the time-domain observations from the TESS and Fermi telescopes to quantify the gamma-ray flux variability based on the optical flux variability. The result of this proposal is used to develop data quality metrics that can be used to define samples of light curves for future studies and to optimize observing strategies that maximize the scientific return of time-domain data. To perform this study, we need to analyze Fermi data to obtain an accurate measurement of the gamma-ray flux at the time of TESS observations.
161131	JANETH	VALVERDE QUISPE	TACKLING THE SUN AND MOON CONTAMINATION ON FERMI-LAT LIGHT CURVES	For over 14 years the Fermi-LAT has been serving the time-domain and multi-messenger community as the main source of well-sampled high-cadence gamma-ray light curves, which makes it a key instrument towards the understanding of the underlying physics behind the most extreme objects in the universe. However, in spite of the published studies on the gamma-ray emission from the Sun at the level of the brightest LAT sources in the sky, the presence of these objects in the proximity of the source of interest is most of the time ignored, thus giving place to a potential spurious brightening of the target. In this project, we will analyze the level at which the presence of the Sun and the Moon impacts our ability to estimate the flux of the source of interest for targets with different brig

161136	KONSTANTINOS	KALAPOTHARAKOS	THE CURIOUS CASE OF PSR J2021+4026	The PSR J2021+4026 is unique among the Fermi pulsars because of its repeating abrupt changes in its spindown rate and gamma-ray luminosity and a shift of 0.2 in the phase of its thermal X-ray emission, quantities that return to their original values on year time scales. We argue that these are manifestations of a restructuring of its small-scale high multipolar structure, which leaves its dipole basically the same. We propose a detailed MCMC study of the parameters associated with its force-free multipolar structures and gamma-ray emission at these two distinct states of spindown rate and gamma-ray luminosity. Their association with a pulsar of the same macroscopic parameters (mass, radius, magnetic field) will shed new light on the details of radiation emission and EM dynamics of pulsars.
161138	SLAVKO	BOGDANOV	UNCOVERING AND CHARACTERIZING FERMI-SELECTED REDBACK MILLISECOND PULSARS	Redbacks are a recently recognized class of eclipsing binary millisecond pulsars that appear to be an evolutionary link between "recycled" radio millisecond pulsars and their low-mass X-ray binary progenitors. We request support to continue the successful comprehensive multiwavelength program to identify and characterize redback binaries in unassociated Fermi LAT sources, discover their radio pulsations and obtain phase-connected timing solutions. This effort will lead to improved understanding of the peculiar phenomenology of these systems, Galactic MSP demographics, and compact binary evolution.