prop_num	pi_fname	pi_lname	Title	Abstract
131002	BRIAN	METZGER	GAMMA-RAY EMISSION FROM ENGINE-POWERED SUPERNOVAE	A growing sample of stellar explosions have been discovered with peak luminosities too high to be powered by traditional energy sources. A popular model for such "superluminous supernovae" (SLSNe) posits the birth of a millisecond magnetar engine, but assumes the magnetar's spin-down luminosity is thermalized by the ejecta with 100% efficiency. We will develop a Monte Carlo radiative transfer model for magnetar-powered supernovae which self-consistently accounts for radiative processes in their wind nebula and ejecta and makes predictions for the late-time escape of non-thermal gamma-ray emission. Our results will be compared to detections or upper limits of SLSNe with Fermi LAT and Air Cerenkov telescopes like VERITAS/MAGIC in order to test the magnetar model for SLSNe.
131003	ALEXANDER	KASHLINSKY	COSMOLOGICAL DIPOLE OF THE EXTRAGALACTIC GAMMA-RAY BACKGROUND WITH MULTI-YEAR FERMI-LAT DATA	We propose to probe the cosmological dipole of the Extragalactic Gamma-ray Background (EGB). The EGB dipole, due to the local peculiar motion, appears measurable from the 12 yr Fermi-LAT data and should provide important verification of the kinematic origin of the dipole of the cosmic microwave background. Our pilot study shows that, with assembling the full multi-year diffuse maps from LAT data over ~[0.1-10] GeV, we can identify the EGB dipole at significant S/N, after accounting for Galactic gamma-ray emissions and systematics.
131004	BRIAN	METZGER	MULTI-DIMENSIONAL MODELS OF SHOCK-POWERED EMISSION 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. We will extend our recent analytic and local-box simulation work on radiative shocks in novae to global 2D and 3D simulations of the shock interaction in these systems and their multi-wavelength emission. By combining the distribution of inclination angles across the shock front relative to the upstream magnetic field with the results of particle-in-cell simulations, we will also predict the average particle acceleration efficiency and compare to those observed. Particular focus will also be placed on connecting the LAT gamma-ray emission to the viewing-angle dependent thermal and non-thermal X-rays, as detected by Swift and NuSTAR.

131005	FRANCESCO	MASSARO	AN OPTICAL PERSPECTIVE OF THE UNKNOWN GAMMA-RAY SKY	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 extend our optical spectroscopic campaign, already approved in Fermi Cycle 6, 9, 10, 11 and 12 to reveal the nature of more than 400 blazar candidates of uncertain type (BCUs) having IR colors similar to known Fermi blazars and listed in the 4FGL. Our legacy project is crucial to prepare future releases of Fermi source catalogs and to improve our knowledge on the blazar population.
131012	ELENA	ORLANDO	QUIESCENT SOLAR GAMMA-RAY EMISSION: PROBING COSMIC RAYS AND SOLAR ENVIRONMENT	The Sun is a known quiescent gamma-ray source. Its quiescent gamma-ray emission is produced by Galactic cosmic rays (CRs) interacting with its surface (disk component) and with its photon field (spatially extended inverse-Compton component). Intensity and spectrum of both components depend on the solar activity. We propose to analyze Fermi Large Area Telescope data on the Sun for the entire mission. This will allow us to gain information on leptonic and hadronic CRs and their modulation througout the heliosphere and close to the Sun, and it will allow studies of the solar environment, including transport and interaction even at the solar surface. Thanks to more than 11 years of data, this study will be performed at different solar conditions and polarity of the Cycle 24.
131013	SVETLANA	JORSTAD	OPTICAL POLARIZATION AND FLUX MONITORING OF GAMMA-RAY BLAZARS AT THE PERKINS TELESCOPE	We propose to monitor the flux (BVRI bands) and optical linear polarization of 46 gamma-ray AGN 8-10 nights per month at the 1.8m Perkins telescope to build a database of polarization parameter behavior during gamma-ray quiescent and flaring states. We will construct gamma-ray and optical light curves and polarization curves to search for correlations between gamma-ray and optical flux and polarization variations, analyze spectral index evolution, and study magnetic field properties in optical emission regions at different gamma-ray activity states. We will include new sources in the sample according to Fermi, VHE, and neutrino alerts. This information will lead to important insights into the particle acceleration mechanisms and locations of gamma-ray emission sites in AGN.

131017	JUSTIN	FINKE	PROBING COSMIC RADIATION FIELDS WITH FERMI: STAR FORMATION HISTORY AND INITIAL MASS FUNCTION	We have begun updating an extragalactic background light (EBL) model to account for mass density and metallicity evolution, and realistic stellar spectra. We propose to finish this model update, and use it to fit Fermi gamma-ray opacity data from blazars and a wide variety of other data from the literature, including luminosity density and stellar mass density data. We will use the fits to probe the star formation rate density of the universe and the stellar initial mass function.
131028	ROSALBA	PERNA	CONNECTING THE PROPERTIES OF BINARY COMPACT MERGER EJECTA WITH THE PROMPT EMISSION OF THEIR JET-COCOON SYSTEMS	The discovery of GW170817, the merger of a binary neutron star, has opened a new window of exploration in the physics of neutron stars. Among the important quantities yet to be measured are the ejected mass and the delay between the merger and the launching of a relativistic jet. These encode information on the equation of state of the neutron stars, the nature of the remnant, and the jet launching mechanism. We propose to perform analytic and numerical studies of jets expanding in environments with different density, velocity, and size. We will compute the jet-cocoon structure at the radiative stage and the properties of the gamma-ray emission. Our results will increase the interpretative power of Fermi observations by allowing for a direct connection with the merger physics.
131031	MAXIM	BARKOV	3D HYBRID RMHD MODELING OF STELLAR AND PULSAR WIND INTERACTION IN GAMMA RAY BINARIES	Gamma-ray binaries are an important class of Fermi sources, that may hold a clue to particle acceleration mechanisms in astrophysical sources, test theories of stellar evolution and may provide a link to mysterious Fast Radio Bursts. In these systems the interaction of the relativistic wind from a compact object, most likely a neutron star, with the wind from a high-mass companion leads to the orbital-dependent generation of powerful gamma-ray emission and flares. But the origin of the gamma-ray emission and its variability remain unknown. In the proposed research we will perform first 3D relativistic hybrid MHD simulations of the interaction of the magnetized pulsar and stellar winds. We will account for various intrinsic interaction geometries, as well as subtle kinetic effects.

131044	ABE	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 4FGL Fermi-LAT sources. Prior programs led to Swift observations of 261, 199, ~600, & >410 Fermi unassociated sources from 1,2,3, & 4FGL catalogs respectively. Possible x-ray counterparts are found in ~1/3 of these. We propose >200 new observations of 4FGL unassociated sources. 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.
131047	LORENZO	SIRONI	UNDERSTANDING TURBULENCE-POWERED BLAZAR EMISSION	Blazars, Active Galactic Nuclei launching a jet directed towards the Earth, offer a unique opportunity to study the radiation produced in extreme astrophysical environments. Modeling of the Spectral Energy Distribution (SED) of blazars has the potential to provide invaluable insights on the physical properties of relativistic jets. However, despite the enormous observational progress, our current understanding is limited by the use of ad hoc assumptions for the particle momentum distribution in the emission region. We will model the particle momentum distribution from first principles using fully kinetic, large scale simulations of magnetized turbulent plasmas. We will address the far-reaching implications of the fact that particles energized by turbulence are strongly anisotropic.
131048	ABE	FALCONE	USING SWIFT FOR MULTIWAVELENGTH STUDIES OF FERMI BLAZARS: SEDS AND LONG-TERM LIGHTCURVES	This proposal will enable long-term low-to-high state multiwavelength coverage of Fermi sources of interest, specifically with Swift, while also enabling more intense ToOs on high states from blazars and transients. In the coming cycle, we will add value by implementing SED fitting with lepto-hadronic models, with publicly posted results. This legacy project is needed for long-term multi-band correlation and emission studies in low-to-high states, enabling acceleration/emission studies of blazars. Observations will be coordinated with other observatories to maximize science return. This effort provides a real-time public reduced-data service and an archival legacy project for all researchers of these high interest Fermi sources (available at www.swift.psu.edu/monitoring/).

131057	SVETLANA	JORSTAD	VARIABILITY OF EMISSION LINES IN GAMMA-RAY QUASARS AND RADIO GALAXIES WITH THE LDT	We propose to observe a sample of gamma-ray quasars and radio galaxies with the 4.3 m Lowell Discovery Telescope (LDT) to investigate variations of optical emission lines during gamma-ray/optical outbursts. We will 1) establish a quiescent spectrum for each source in the sample, 2) create a FeII-FeIII template for a quiescent quasar-blazar, 3) monitor the variations of the spectral-line profiles of 2-3 flaring sources, 4) develop explanations of the observed line variability, and 5) determine how the line variability relates to the source of seed photons for gamma-ray production. We may include new flaring VHE quasars in the sample in response to Fermi and VHE alerts.
131058	ALAN	MARSCHER	VLBA AND MULTI-MESSENGER OBSERVATIONS OF GAMMA-RAY BRIGHT BLAZARS **(Large Project)**	We propose to continue monthly VLBA imaging of 33 radio and gamma-ray bright active galactic nuclei at 43+86 GHz as part of a comprehensive multi-waveband flux and polarization monitoring program. 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 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.
131062	MATTHEW	BARING	ENERGIZING NON-THERMAL ELECTRONS IN GAMMA-RAY BURST SHOCKS	The vast majority of gamma-ray bursts exhibit a sufficiently narrow peak in their prompt spectrum to suggest emission by a preponderance of non-thermal electrons. How radiation from thermal electrons is suppressed in GRB shock environs outside the photosphere is not understood. This proposal explores the influence of charge separation potentials on energy exchange in relativistic electron/positron-ion shocks, and how this can facilitate the production of these narrow nu-Fnu peaks. These hybrid shocks will be simulated using particle-in-cell simulations that probe the turbulent plasma environment. Resulting pair distributions will be folded into synchrotron and other emissivities to use the spectra of bright Fermi/Swift bursts to constrain shock magnetization and field obliquities.

131067	KE	FANG	A JOINT ANALYSIS OF FERMI-LAT AND HAWC OBSERVATIONS OF GAMMA-RAY HALOS AROUND MIDDLE-AGED PULSARS	Surprisingly extended very-high-energy gamma-ray emission have been detected around several middle-aged pulsars by the HAWC Observatory. The nature of these TeV halos is unknown. We have set up a framework to jointly analyze Fermi-LAT and HAWC observations of a region-of-interest. We will apply this framework to the sky regions with detected TeV halos around middle-aged pulsars. Our method enables a simultaneous fit to the 100 MeV to 100 TeV data and can directly address the question whether gamma-ray emission over six decades is produced by a common cosmic-ray population that are originated from the pulsars and diffuse to the surroundings. This project will advance the understanding of particle acceleration and interaction in the vicinity of pulsars.
131072	ELEONORA	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
131078	MARCO	AJELLO	THE FIRST 5 SIGMA DETECTION OF PERIODICITIES IN BLAZARS	Until now, the detection of periodicities in the lightcurves of blazars has been a matter of debate as most reported signals are either of low confidence or affected by systematic uncertainties. We have performed a systematic search of periodic signals in blazars using a comprehensive set of methods that have been optimized on simulated gamma-ray data. This program will result in the first >5 sigma detection of periodic signals in four blazars. The discovery of periodic emission in blazars will provide crucial information about the inner regions of the accretion disk, the structure of the jet and unveil the presence of binary super-massive black hole systems.
131080	PETER	JENKE	WHAT IGNITES THERMONUCLEAR X-RAY BURSTS IN H-POOR CONDITIONS?	We propose to use data from Fermi-GBM to address the ignition of H-poor thermonuclear X-ray bursts (tXRBs). Our previous investigation was very susccessful having detected 752 Type-1 X-ray bursts in a three year period. All of the detected tXRBs had a peak blackbody temperature consistent with photospheric radius expansion (PRE) bursts from low-\dot{m} bursters. Now is the time to bring this work up to date by looking back to 2008 and forward to 2020. We will find and analyze thousands of PRE tXRBs and significantly improve the understanding of the \dot{m}-t_{rec} relationship for these difficult to observe events.

131084	JAMIE	KENNEA	IMPROVING THE LOCALIZATION OF FERMI/GBM GRBS WITH SWIFT/BAT EVENT DATA	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 theGBM error region. We estimate obtaining arc-minute localizations for at least 15 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 future multi-messenger detections of NS mergersby GBM and the GW detector network.
131086	PETER	JENKE	FURTHER ENHANCEMENTS AND CONTINUED OPERATION OF THE GBM ACCRETING PULSAR PROGRAM	Since Cycle 1 we have been continuously monitoring the full sky with Fermi-GBM for pulsars with spin frequencies in the 1 mHz to 16 Hz (since Cycle 7). We conduct daily blind searches to discover previously unknown or quiescent pulsars. We are providing, through our website and ATels, quick-look measurements of pulsed flux and frequency for use in multi-wavelength observations. We propose, for Cycle 13, to further enhance our online query tool and add publicly available utilities to create pulse profiles, remove or add orbital signatures, determine pulsed phase, and plot frequency and pulsed histories. These functions are currently the most requested services and are also the services that lend themselves to being performed by a public utility.
131091	ZORAWAR	WADIASINGH	INVERSE COMPTON SCATTERING IN SPIDERS BINARIES	Follow-up of unidentified LAT sources has caused a proliferation of spider binaries. Many spiders exhibit nonthermal orbital modulation, thought to arise from the interaction of the pulsar wind with the companion's wind/magnetosphere. Recently, two spiders have been confirmed to exhibit orbital modulation in LAT. Although synchrotron emission from the intrabinary shock can explain such LAT modulation, anisotropic inverse Compton scattering of the companion's photons by relativistic pairs may also be an important emission channel. To assess this channel, we propose detailed calculations of anisotropic scattering, including observer-dependent light curves, powered by relativistic pairs. Comparison with data will also elucidate on their contribution to the energetic positron excess.

131093	MATTHEW	BARING	THE MAXIMUM ENERGY OF PERSISTENT EMISSION IN MAGNETARS	Magnetars exhibit steady, powerful, non-thermal pulsed emission up to around 150-250 keV, as measured by RXTE, INTEGRAL, NuSTAR and Fermi-GBM. Leading models for the production of these signals center on resonant inverse Compton scattering in their inner magnetospheres. This proposal will explore why magnetar emission is not seen at higher energies, investigating how the QED processes of magnetic photon splitting and pair creation can attenuate X rays and gamma rays. We plan new opacity calculations of photon attenuation via such splittings and pair conversions in twisted magnetospheres, to discern what generates the inferred spectral turnovers in magnetars, and how details of opacity provide diagnostics on the viewing perspective and magnetic inclination geometry for magnetars.
131096	RAFFAELLA	MARGUTTI	CONSTRAINING THE MOST EXTREME MASS LOSS EVENTS FROM MASSIVE STARS WITH FERMI AND THE VLA	Building on the GeV detection of SN iPTF14hls at d=150 Mpc, we propose a systematic search for GeV emission from nearby (d<150 Mpc) SN shocks interacting with a dense environment. GeV emission is predicted to originate as the SN ejecta crash into dense shells of material previously ejected by the progenitor star. We capitalize on Fermi/LAT and VLA observations with three goals: (i) Test the supernova shock breakout through a dense wind model using GeV observations. (ii) Constrain the cosmic rays acceleration at shocks formed by the collision between the SN ejecta and the CSM shell. (iii) Deliver the first predictions of the neutrino emission associated to ordinary interacting SNe and super-luminous SNe. This study opens up a new window of investigation on the most extreme mass-loss
131098	MATEUSZ	RUSZKOWSKI	COSMIC RAY SHOCK ACCELERATION AND THE FORMATION OF THE FERMI BUBBLES	The Fermi bubbles are among the most important discoveries of the Fermi Gamma-ray Space Telescope; however, their origin is still elusive. We propose to investigate the formation of the Fermi bubbles using three-dimensional simulations including relevant cosmic-ray (CR) physics. Specifically, we will investigate the impact of CR acceleration by shocks, which have not been self-consistently included in previous theoretical models. This study will enable constraints on the efficiency of shock acceleration and comprehensive understanding of the thermal and non-thermal emission of the bubbles, thereby providing crucial information to disentangle different formation mechanisms of the bubbles. This work will have important implications for Fermi observations and CR acceleration in our Galaxy.

131111	MICHAEL	BRIGGS	DISTINGUISHING BETWEEN TGF PRODUCTION MODELS WITH JOINT OBSERVATIONS OF FERMI GBM AND ASIM	We will test two models for the acceleration of electrons in TGFs, the relativistic feedback model and the lighting leader model, by analyzing TGFs jointly observed by Fermi GBM and ASIM. These models predict differences in gamma-ray intensities and spectra as a function of beam angle. Analysis of data from the two instruments at two different observation points in the TGF beam will more directly and powerfully distinguish between TGF models than possible with a single point observation. The data will be deconvolved using simulations of the models, with the deconvolution including corrections for detector deadtime and pulse pileup. The joint analysis is synergistic, testing both acceleration models more stringently than either instrument can accomplish by itself.
131113	ELIAS	AYDI	TOWARDS A UNIVERSAL SCENARIO FOR SHOCK FORMATION IN NOVAE	Fermi/LAT detected 15 novae in 11 years of its survey, revealing a new class of cosmic particle accelerators. The two brightest GeV novae showed correlated gamma-ray/optical variability suggesting shocks as the common origin for the bulk of the bolometric luminosity and the gamma-rays. The scenarios leading to the formation of these shocks are still poorly explored. We propose continuation of the search for gamma-ray-bright novae in Fermi/LAT data. We ask for NRAO/VLA and NOAO/Gemini to compliment our multi-wavelength analysis, aiming to understand shock formation and mass loss in novae. Understanding shocks in the high-density, low-velocity regime in novae is relevant to other types of shock-powered transients including Type IIn supernovae, tidal disruption events and stellar mergers.
131119	ERIC	CHARLES	CONTINUED SUPPORT OF FERMI-LAT SCIENCE WITH PUBLICLY AVAILABLE SOFTWARE	This proposal is a continuation of a proposal selected in the previous cycle. The proposed work will increase the scientific output of Fermi-LAT: 1) by completing and deploying a new set of ongoing developments to the fermipy software package and 2) by supporting continued development and maintenance of both the fermitools and fermipy packages. These developments will not be possible without the funding requested in this proposal.

131121	PAUL	RAY	RADIO SEARCHES FOR MSPS AMONG THE 10 YEAR FERMI LAT SOURCES	Fermi has had a spectacular impact on pulsar research, and millisecond pulsars (MSPs) in particular. In the past decade, astronomers have discovered at least 95 new MSPs in searches directed towards Fermi LAT unassociated sources. The vast majority were discovered as part of the Pulsar Search Consortium. We aim to continue this success using new observations with the GBT based on the current 4FGL catalog as well as the latest LAT source lists from 10 years of survey observations. This includes faint new gamma-ray sources as well as some previously known very pulsar-like sources in case eclipses or unfortunate scintillation hampered earlier search efforts. We request 40 hours of GBT time to perform the radio searches.
131122	MICHAEL	BRIGGS	CLASSIFYING FERMI GBM SUB-THRESHOLD TRANSIENTS	There are two searches for sub-threshold short GRBs (sGRBs) in the Fermi GBM data. The untargeted search agnostically searches all of the CTTE Data, while the targeted search makes a deeper coherent search around specific times of interest. A challenge is classifying the weak transients found by these searches. We know that some of the transients are short GRBs, as they have been confirmed by other instruments. We propose to develop a Bayesian method to classify the sGRBs and other events identified by the sub-threshold searches. This will increase the significance of any association of a subthreshold sGRB with a multi-messenger signal, since the sample of reliable sGRBs will be smaller, and will also provide more reliable sGRBs for followup with wide-field telescopes to find kilonovae.
131123	JOSHUA	WOOD	MODERNIZING THE PUBLIC FERMI GBM RESPONSE GENERATOR AND GRB LOCALIZATION ALGORITHM	After 12 years of operations Fermi GBM is now the most prolific detector of GRBs to date and continues to support studies of a wide variety of transient phenomena. However, the new era of multimessenger astrophysics is pushing the boundaries of what can be done computationally with the existing response generator and localization tools that were developed at the start of the Fermi GBM mission. We propose modernizing both the GBM response generator and GBM localization algorithm to provide faster and more efficient routines. These will interface with the existing Python-based GBM Data Tools, thereby completing the functionality of the public GBM Data Tools.

131126	ANDREW	INGLIS	COMPREHENSIVELY PROBING MODULATION OF SOLAR FLARE ENERGY RELEASE USING FERMI/GBM	Fermi/GBM has observed over 5000 solar flares since launch in 2008. We will analyze all significant flares observed by GBM to identify and characterize short-period modulation in thermal and nonthermal X-rays. These modulations are directly connected to the fundamentals solar flare energy release, including magnetic reconnection, particle acceleration, and plasma heating. We will measure X-ray modulation periods and determine how they depend on other key flare parameters, such as size scale, growth rate, active region magnetic complexity, and total energy released. The existence of scaling relationships between flare pulsations and the underlying flare system has important implications for theoretical models of particle acceleration and energy release.
131129	GEORGE	YOUNES	FERMI GBM STUDY OF TYPE II X-RAY BURSTS FROM THE BURSTING PULSAR	We propose a detailed time-resolved spectroscopy study of type II X-ray bursts from the Bursting Pulsar (BP) detected by Fermi GBM during its 2014 activation. We will complement the GBM data with lower energy data from pointed telescopes. The peak of the BP bursts could reach more than an order of magnitude Eddington flux. Hence, we will search for spectral evolution from the bursts as the accretion flow increases by more than a factor 10 in seconds time-span. We will also look for any spectral variation in the bursts during the full 100-day outburst of the source, i.e, as a function of mass-donor accretion rate. The results of this analysis could potentially constrain the production site of the bursts and shed light on the physical mechanism responsible for them.
131130	DANIEL	KOCEVSKI	FERMI GAMMA-RAY FOLLOW-UP OF HIGH-ENERGY NEUTRINOS	The recent detection of a neutrino correlated in space and time with a flare from a gamma-ray blazar, TXS 0506+056, has provided a tantalizing clue to the origin of the astrophysical neutrinos detected by the IceCube neutrino observatory. However, constraints on neutrino emission from known gamma-ray blazars, and the identification of previous neutrino emission from TXS 0506+056 with no coincident gamma-ray activity indicates that the census of the source population responsible for the isotropic flux of astrophysical neutrinos is still incomplete. We propose to use a new untriggered all sky search for neutrino clusters in IceCube data, as well as the IceCube real-time alert streams, to trigger a comprehensive search of Fermi GBM and LAT data on a variety of timescales.

131138	DANIEL	KOCEVSKI	THE FERMI LAT LIGHT CURVE REPOSITORY	We propose to develop the Fermi LAT Light Curve Repository, consisting of a public library of light curves for variable Fermi LAT sources. The light curve repository aims provide publication quality light curves on timescales of days, weeks, and months for over 1300 sources deemed variable in the 4FGL catalog. The repository will consist of mission duration light curves generated through a full likelihood analysis of the source and surrounding region, providing flux and photon index measurements. Hosted at NASA s HEASARC, the library will give users on demand access to this light curve data. Such a system will serve as a resource to the time-domain and multi-messenger community by helping scientists monitor interesting LAT sources and alerting them of gamma-ray flares in near real time.
131139	OLIVIER	HERVET	BUILDING THE FIRST MAP AND ANISOTROPY SPECTRUM OF THE EBL FROM EXTRAGALACTIC GAMMA-RAY SOURCES	Thanks to Fermi and Cherenkov detectors, the extragalactic background light (EBL) spectrum has been well characterized. However, we still know little about the amplitude and distribution of its spatial anisotropies. The recent release of the Fermi 4FGL catalog allows us to probe the EBL opacity across the full sky with an unprecedented angular definition. We aim to measure the EBL opacity at the coordinates of each sources, combining the 4FGL, 3FHL, archival very-high-energy spectra, and spectra from our own Fermi analysis. The first EBL opacity map of the Universe and the associated spectrum of angular anisotropies will result of this study. This will be a new scientific milestone made possible by more than a decade of data gathered by Fermi and Cherenkov telescopes.
131144	EILEEN	MEYER	THE RETURN OF THE IC/CMB MODEL: SEARCHING FOR INVERSE COMPTON PLATEAUS FROM JETS WITH FERMI	Fermi observations of powerful jets have been instrumental in clarifying the X-ray emission mechanism in kpc-scale jets, ruling out the once-popular Inverse-Compton off the CMB (IC/CMB) model in dozens of sources (Breiding, 2018). However, out of the entire sample of X-ray emitting jets detected by Chandra, we have found two cases where the minimum Fermi gamma-ray spectrum precisely matches that expected for the IC/CMB model for X-ray emission from large-scale jets. Based on this surprising finding, we outline a new study to look for additional cases of "IC/CMB Jets", which can be identified by a characteristic 'plateau' signature in a recombined lightcurve analysis.

131153	NURIA	TORRES-ALBA	THE HOSTS OF GAMMA-RAY LOUD NARROW-LINE SEYFERT 1 GALAXIES	The process of triggering relativistic jets in AGN is still fundamentally unknown. It has been proposed that galaxy mergers could play an important role in jet launching, given how jets are often found in elliptical galaxies. Our recent detection of a young jet in the merger of a NLSy1 and a Sy2 galaxy may prove supporting evidence to this theory. Here, we propose to observe seven NLSy1 galaxies detected by the Fermi-LAT (therefore good candidates to host line-of-sight aligned jets), whose hosts have been reported to show signs of merger interaction, with Gemini-North. This will allow us to confirm their merger stage, as well as to characterize the nature of the system (e.g. early-type, accretion luminosity) and potential jet-triggering conditions.
131162	PRAGATI	PRADHAN	DO SUPERGIANT FAST X-RAY TRANSIENTS LAUNCH JETS? A MULTIWAVELENGTH STUDY	Supergiant Fast X-ray transients(SFXTs) are most probable candidates proposed to be associated with unidentified MeV-GeV transients seen with Fermi.We will investigate this association by rigorous cross-matching of gamma-rays with MAXI long-term lightcurves of SFXTs. Although it is speculated that SFXTs emit gamma-rays through formation of jets in magnetic tower,there have been no observational studies yet. This is the 1st time such dedicated analysis of gamma-ray emission from SFXT/SFXT candidates (> 30 seen with Fermi) will be conducted.Overall, we will utilize Fermi,MAXI,optical data (Magellan guaranteed time) to study properties of gamma-ray emitting SFXTs. Such(multiwavelength)studies have important consequences in understanding these enigmatic systems &jet-formation in X-ray binaries
131164	J MARCOS	SANTANDER	ENABLING PROMPT IDENTIFICATIONS OF ELECTROMAGNETIC COUNTERPARTS TO HIGH-ENERGY NEUTRINOS WITH FERMI-LAT	The identification of a joint gamma-ray and neutrino source would represent a smoking gun signature of cosmic ray acceleration. The first tantalizing correlation between both channels was enabled by Fermi-LAT with the identification of the flaring blazar TXS 0506+056 coincident with the IceCube neutrino event IC170922A. This proposal aims providing the high-energy astrophysics community with the tools and a solid framework to foster future Fermi-LAT / neutrinos discoveries.

131166	MATTHEW	KERR	A FERMI-LAT PULSAR TIMING ARRAY	The Fermi-LAT has detected pulsars from over 120 millisecond pulsars (MSPs), and we propose to harness this population in a pulsar timing array (PTA) to search for low-frequency gravitational waves. We show that the sensitivity of such an array is comparable to ground-based PTAs---collaborations using large radio telescopes to monitor tens of MSPs. Fermi offers unique advantages: no distortion from the interstellar medium or terrestrial interference, continual monitoring of every MSP in the sky, and a long, high-quality homogeneous data set. We propose to build the tools needed to perform correlation analysis on photon-based data and perform the first search for gravitational waves with a gamma-ray telescope.