PropID	PI	Title	Abstract
11036	KIPPEN	OPTIMIZING GBM CAPABILITY FOR ENABLING PROMPT GRB OPTICAL OBSERVATIONS	The GLAST Burst Monitor (GBM) will detect and locate ~200 gamma-ray bursts (GRBs) per year. This capability, combined with very wide-field robotic telescope systems, could provide ground breaking prompt optical GRB observations. We must minimize time delay and location uncertainty of GRB alerts, and maximize the number of locatable bursts. Current location algorithms do not fully include important systematic effects due to spacecraft and atmospheric scattering. We propose to use the extensive GBM/GLAST modeling and simulation capability to design optimized flight and ground software algorithms to achieve this. Algorithm effectiveness will be evaluated through statistical comparisons with, e.g. Swift, and implemented in automated GBM software systems after appropriate testing and review.
11040	JORSTAD	HIGH RESOLUTION MAPPING OF THE GAMMA-RAY EMISSION REGIONS IN BLAZAR JETS	We propose to mount a multiwaveband polarization campaign of 12 gamma-ray bright blazars to identify the features in compact jets responsible for rapid gamma-ray, X-ray, and optical variability. We will locate the optically emitting regions relative to the VLBI core by observing the polarization signature at the shorter wavelengths and on the VLBA images. To do this, we propose a 2-week campaign involving VLBA (7 mm) polarimetry at 4 epochs and daily monitoring of the optical polarization and X-ray, optical, and IR fluxes along with gamma-ray light curves provided by GLAST. Wavelength-dependent time delays in the variations accompanied by changes in the VLBA images will allow us to register the gamma-ray, X-ray, and optical emission relative to features in the compact jets.
11065	DENNIS	FACILITATING THE JOINT ANALYSIS OF GLAST SOLAR FLARE OBSERVATIONS	We propose to incorporate GLAST solar flare data into the Solar Software (SSW) framework that has tools developed for analysis of X-ray and gamma-ray observations from other missions, including RHESSI, CGRO, Yohkoh, and SMM. This will enable solar scientists to access the GLAST GBM and LAT data (once publicly available) for specific solar flares and carry out joint scientific analysis with observations of the same events from other observatories, both space- and ground-based. None of the proposed work requires access to LAT proprietary information. It will be performed primarily at NASA GSFC and will use tools being developed by the Goddard CoIs for the Virtual Solar Observatory(VSO).
11068	NORRIS	COORDINATED NIR GAMMA-RAY OBSERVATIONS OF FLARING AGN	Using a new NIR camera sited on the Magdalena Ridge Observatory s 2.4-m telescope, we will make NIR observations, spanning R to M bands, simultaneous with the ~ two dozen GLAST/LAT sources whose fluxes will be routinely provided to the community. The NIR observations will cover the spectral region where blazars are known to emit their main synchrotron power, and will be of temporal density commensurate with variability timescales detectable by the LAT for these bright AGN, and potentially over a baseline up to the GLAST mission lifetime - achieving sufficient coverage of the two major peaks in blazar spectra to make useful constraints on models. Analysis of the NIR and gamma-ray data will be coordinated with data from other wavebands available via the LAT team s multi-wavelength efforts.

11075	BOETTCHER	EMISSION LINE FLUX MONITORING OF 5 LAT MONITORED BLAZARS	We propose to initiate a program to monitor the emission line flux of 5 prominent blazars on the list of LAT monitored sources, using the 2.4-m telescope of the MDM observatory at Kitt Peak. Our targets exhibit (occasionally) strong, broad emission lines, and for three of them coordinated multiwavelength campaigns have been pre-planned during GLAST Cycle 1. Monitoring the emission line flux will be essential to provide information on the correlation between the disk luminosity and the power in the jet, and to measure directly the luminosity of the external radiation field of the broad line region as a potential target photon field for Compton upscattering as a possible gamma-ray emission mechanism for blazars of the quasar or low-frequency-peaked BL Lac type.
11088	BEGELMAN	GAMMA-RAY PRODUCTION IN BLAZAR JETS: RETHINKING THE PARADIGM	TeV observations of blazars challenge the standard models of gamma-ray production in jets. The detection of very rapid variability in PKS 2155-304 and Mrk 501 indicates that gamma-rays are produced in very compact regions with far larger bulk Lorentz factors than previously thought. We propose to study the implications of these and related observations for the energy dissipation and spectrum formation processes in relativistic jets. We will focus on the energy requirements of the compact emission sites, their distances from the black hole, the nature of the dissipation and particle acceleration processes, and the stringent constraints imposed by pair-production opacity. We will predict how multiband observing campaigns involving GLAST can help to pin down the physical processes at work.
11089	PROFUMO	PROBING DARK MATTER WITH AGN JETS	The energetic electrons and protons in AGN jets can scatter off the dark matter (DM) particles of the host galaxy and produce almost isotropic high-energy gamma rays (GR) in the final state. For AGN jets pointing away from the line of sight, GR from DM scattering can dominate over the collimated flux of up-scattered ambient photons. We propose to use GR from DM scattering in AGN jets as a method to detect DM with GLAST. In our study we will (1) fully compute the relevant cross sections for neutralinos and for the lightest Kaluza-Klein particle of universal extra-dimensions (2) identify the most promising AGN targets (3) model the DM distribution of the target AGN host galaxies and (4) study the smoking-gun spectral features and the expected off-axis GR fluxes from DM scattering.
11090	PRIMACK	MODELING GAMMA-RAY ATTENUATION	High energy gamma-rays emitted by distant sources are attenuated due to pair production on the extragalactic background light. The GLAST LAT will be ideal for studying the origin and evolution of the ionizing UV background via its effect on the spectra of these objects. We propose to combine the latest work in semi-analytic modeling and radiative transfer with observational constraints on ionization of the intergalactic medium to develop realistic models of the UV background, from which we will compute optical depth vs. energy and redshift for reconstructing intrinsic spectra of GeV sources from observations. GLAST will also act as a finder of sources for ground-based ACTs, and we also propose to extend previous work on attenuation of higher-energy gamma rays.

11107	DAME	A UNIFORM CO SURVEY OF THE ENTIRE NORTHERN SKY WITH THE CFA TELESCOPE	The 1.2 meter millimeter-wave telescope at the Harvard-Smithsonian Center for Astrophysics and its twin instrument in Chile have for over 25 years provided several generations of gamma ray telescopes with the most extensive and uniform Galactic CO surveys available. Here we propose to extend our uniform CO mapping over the next three years to cover the entire sky visible to our northern telescope and to map in greater detail the high-latitude molecular clouds that are likely to be detected by GLAST. The uniform survey will consist of 115,200 CO spectra covering 7200 deg2 with 1/4-deg sampling; the detailed cloud mapping will require an additional 19,200 spectra. Our overarching goal is to improve the gamma ray diffuse emission model on which much of GLAST science will depend.
11124	LISTER	THE MOJAVE PROGRAM: JET KINEMATICS OF GAMMA-RAY BLAZARS	MOJAVE (Monitoring Of Jets in AGN with VLBA Experiments) is a large program to investigate the structure and evolution of AGN jets via regular full-polarization, sub-milliarcsecond resolution VLBA imaging at 15 GHz. The MOJAVE sample includes all known gamma-ray AGN in the northern sky, as well as the brightest 133 radio-loud AGN above declination -20 deg. This will be supplemented by the 100 brightest GLAST sources that exceed our sensitivity criteria, thus providing an unprecedented data base for comparisons between AGN jet activity and gamma-ray variability. Our VLBA images and supporting multiband data will be used to constrain jet emission models and derive physical parameters for over 250 GLAST-detected blazar jets, and will form a valuable public resource during the GLAST mission.
11131	JOHNSON	NEW ALGORITHMS FOR BLIND PULSAR SEARCHES WITH GLAST	GLAST will detect many tens of known radio or X-ray pulsars plus a smaller number of new ones from deep follow-up observations. The most interesting new pulsars may be those detected via blind gamma-ray searches. Discovering these rare Geminga-like radio- and possibly X-ray-quiet pulsars will require computationally intensive searches with clever algorithms. New algorithms are required to deal with the months-long datasets and the resulting periodicity changes due to position errors, timing noise, glitches, and spin-down. We propose to investigate high-performance coherent "folding" algorithms using parallel computing and specialized hardware (e.g. GPUs and Cell) and innovative incoherent algorithms to allow searches of even multi-year datasets on modest computational hardware.

11135	RAY	MULTIWAVELENGTH STUDY OF LS I +61 303	LSI +61 303 is an exotic HMXB with a 26.5 day orbital period, and is a bright, variable source of gamma-rays in the GeV and TeV bands. It is the only Galactic source on the 1st year monitoring list, and has been modeled as a "microquasar" though recent evidence suggests it is a shrouded pulsar. We propose to exploit GLAST's unprecedented gamma-ray monitoring of this source by mounting a multiwavelength campaign designed to reveal its true nature. Our program includes: (1) approved RXTE bi-weekly monitoring, (2) intensive monitoring of a single 26-day orbit with 11 RXTE observations, (3) new optical monitoring of the Be-star disk state, (4) a deep search for radio pulsations with the GBT, (5) VLA observations during the intensive orbit study, and (6) long-term radio monitoring at 15 GHz.
11136	MARSCHER	COMPREHENSIVE MULTIWAVEBAND MONITORING PROGRAM OF GAMMA-RAY BRIGHT BLAZARS	The investigators propose a comprehensive 3-yr multiwaveband program designed to probe the processes of gamma-ray emission, particle acceleration, and jet physics in blazars by connecting gamma-ray variations to events at lower frequencies. They will observe 29 radio-loud AGN monthly with (1) the VLBA to collect sequences of 43 GHz images of the jets in both total and polarized intensity, (2) VLBI at 86 GHz to obtain snapshots of the jet at the highest resolution available, and (3) X-ray, optical, and mm-wave telescopes to monitor flux and (for the latter two) polarization variations. Interpretion of this extensive database with correlation analysis and theoretical modeling will determine the location and physical state of the gamma-ray and other high-frequency emission regions in the jet.
11138	BEGELMAN	PINCHED CORES VS. SHEARED SHEATHS: ARE BLAZAR JETS "INSIDE-OUT"?	Ultrarelativistic jets have two likely sites for dissipation: a sheared and/or shocked boundary layer at the interface with the ambient medium, and an unstable core pinched by magnetic tension. Unless the jets are extremely tightly confined, these regions are not in causal contact and evolve independently of one another. We will study the evolution of these two regions in accelerating and coasting jets, and their relative contributions to observed synchrotron emissivity and polarization patterns. We will analyze how GLAST and multi-wavelength monitoring of compact radio sources can be combined with large VLBI surveys to test models for dissipation in jets.
11143	AKERLOF	PROMPT OPTICAL OBSERVATIONS OF GAMMA-RAY BURSTS IN CONJUNCTION WITH THE GLAST LAT DETECTOR	The ROTSE telescope array will be used to promptly observe the locations of GRBs identified by the GLAST LAT detector. With a field of view of 3.5 square degrees at four independent locations, the ROTSE telescopes can optically detect a large fraction of GRBs that trigger the LAT. We will provide precise coordinates for positive detections within minutes to the global community, enabling spectroscopic observations and deeper photometry. Such measurements will be critical to discovering the role of high energy photon emission in the evolution of GRBs. The wide field of the ROTSE telescopes will also be employed to monitor the optical variability of specific AGNs and localize others for which there is a short duration variability common to both optical and gamma-ray fluxes.

11151	REICHART	UNC-CHAPEL HILL GRB FOLLOW-UP PROGRAMS IN THE GLAST ERA	UNC is currently building and organizing both small robotic telescopes and large human-controlled telescopes that will in many cases uniquely follow-up GRB localizations, including GLAST LAT localizations. In this proposal, we summarize our GLAST-era plans for and progress with the new, robotic 6 0.41-meter PROMPT and 4.1-meter SOAR telescopes at CTIO in Chile, the 8.1-meter Gemini telescopes at CTIO and Mauna Kea in Hawaii, the new 9.2-meter SALT telescope at SAAO in South Africa, HST, and our newest effort, the Skynet Robotic Telescope Network, which already spans both South and North America and is growing rapidly. We also lead the Follow-Up Network for Gamma-Ray Bursts Collaboration, a large telescope collaboration that we organized in preparation for the Swift and GLAST eras.
11157	REIMER	RADIO- AND VHE-GAMMA-RAY TOO-OBSERVATIONS OF GLAST-TRIGGERED BRIGHT TRANSIENTS IN THE GALACTIC PLANE	We propose radio- and VHE gamma-ray ToO-observations of new bright Galactic transients detected by GLAST LAT within $\|b\|<5$ deg at fluxes exceeding 2E-6 ph cm-2 s-1 (E>100 MeV) to determine the nature of events similar to the intense, non-blazar transient of presumably Galactic nature that was detected by EGRET once in its lifetime, and obtain correlated radio- and VHE gamma-ray coverage of flaring/transient events from Galactic sources notorious for such emission phenomena. LAT's sensitivity and rapid alert capability enables focussed but timely counterpart searches. Radio observations will establish counterparts, and probe disk/jet connection aspects through actual activity states; HESS/MAGIC VHE observations will constrain decay times and provide gamma-ray coverage beyond LAT energies.
11158	SMITH	INVESTIGATING THE CONNECTION BETWEEN GAMMA-RAYS AND THE RELATIVISTIC JET IN BLAZARS	We propose to monitor the optical polarization and flux of the blazars that will be followed by the Large Area Telescope during Cycle 1 of the GLAST mission. Polarization provides the only direct information on the degree of ordering of the magnetic field within the region producing the highly relativistically beamed continuum of these objects. Our observations will be made using a highly efficient polarimeter designed and built at the University of Arizona. Analysis of the data will concentrate on finding correlations between gamma-ray variability and optical polarization. Six to eight one-week monitoring campaigns will be spread throughout the year. Approximately one month after each set of observations have been obtained, the optical data will be made fully accessible to the public.

11161	OFEK	GLAST/GBM AS EXTRAGALACTIC SGRS DISCOVERY MACHINE	SGRs are a subclass of repeating GRBs. This rare class of objects constitute unique laboratories for the study of extreme magnetic fields, and will allow us to broaden our understanding of the final stages of stellar evolution. Unfortunately, current research of these objects is limited by the small number of known SGRs. We propose to search for extragalactic SGRs among GBM GRBs. Although most GLAST GRBs will have large positional uncertainties, we argue that by correlating the position of these GRBs with nearby galaxies, and observing these galaxies in the optical, X-ray and radio wavebands, we can find several extragalactic SGR giant flares yearly. A large sample of extragalactic SGRs, that can be found using GLAST, is essential for an observational progress in the study of SGRs.
11167	WILSON	EARTH OCCULTATION OBSERVATIONS OF THE HARD X-RAY/SOFT GAMMA RAY SKY WITH THE GLAST BURST MONITOR	We propose to develop an Earth Occultation technique for the GLAST Burst Monitor (GBM) to allow near continuous monitoring of 8 steradians of the sky from 8 keV up to about 30 MeV. This technique was very successful for the Burst and Transient Source Experiment (BATSE) on the Compton Gamma Ray Observatory, resulting in the discovery of several new sources and numerous new outbursts of known transients. Differences in detector construction resulted in GBM having increased sensitivity over BATSE in the 8-25 keV range. With this technique, we will monitor known variable sources and transients including AGN, galactic black hole binaries, and galactic neutron star binaries. GBM is the only all-sky monitor operating above about 200 keV and it is the only all-sky monitor on-board GLAST.
11181	SAMBRUNA	TESTING ACCELERATION AND COOLING IN POWERFUL BLAZARS WITH GLAST	We propose to use the public LAT spectra and light curves for z>1 blazars to test the idea that acceleration processes are similar in all blazar jets. This assumption is at the core of current unification scenarios, e.g., the "blazar sequence". In particular we will: 1) study the dynamics of the spectral energy distribution peak at GeV energies via spectral-intensity variability, which is produced by the most energetic electrons in the jet; 2) test external Compton models by searching for the cutoff in the GeV spectrum introduced by the Klein-Nishina limit; and 3) using coordinated X-ray observations, determine the kinetic power carried by the jet, which compared with the jet bolometric luminosity dominated by gamma-rays yields its radiative efficiency.
11189	WILLIAMS	OBSERVATIONS ABOVE 100 GEV OF GAMMA-RAY BURSTS DETECTED BY GLAST	We propose to conduct follow-up observations with VERITAS at very high energy (VHE; >100 GeV) of GRBs detected by GLAST, to analyze the resulting data, and to engage in other activities to support the observations. Many afterglow emission models show the SEDs of GRBs to be similar to those of blazars and predict an inverse Compton component with luminosity comparable to the synchrotron component, extending to VHE energies. Yet this component has eluded definitive detection. The delayed X-ray flares discovered by Swift in many bursts are particularly intriguing for the prospects of VHE detection with follow-up observations. They provide a plentiful source of seed photons for inverse Compton scattering and suggest that the burst engine may still be powering the fireball at late times.

11190	KOUVELIOTOU	MAGNETAR OBSERVATIONS WITH THE GLAST BURST MONITOR	We propose to use GBM to detect and monitor (i) outbursts from all known magnetars, (ii) long term broad band spectral variability in the total and pulsed emission of at least 3 sources, and (iii) new magnetar sources. We will search the continuous data for untriggered bursts and even serendipitously detect new and transient magnetar sources. In the rare occurrence of another SGR Giant Flare we will search for QPOs in higher energy ranges. Our results will be available via a Web page; we will also produce a magnetar catalog at the end of the three year period. As these tasks require (i) new software pipelines, (ii) long integrations (2 months per point for spectra and fluxes) and (iii) long term monitoring of SGR outbursts (months to years), we propose a 3 yr effort to fulfill our goals.
11197	JOHNSON	A GREEN'S FUNCTION FRAMEWORK FOR ANALYSIS OF THE DIFFUSE GALACTIC EMISSION AND EXTRACTION OF DARK MATTER SIGNALS	The identification of dark matter is one of the major open questions in particle physics, astrophysics, and cosmology. If it consists of weakly interacting massive particles, it may be possible to detect them in the galactic halo by the products of their mutual annihilations. Disentangling the origins of secondaries from the annihilations is of great importance to the identification of dark matter. We propose to develop a framework for extraction of dark matter annihilation signals from the source-subtracted LAT sky maps that will be available following the first year of GLAST on-orbit operation. This framework will be based upon GALPROP, the current state-of-the-art cosmic-ray propagation and diffuse gamma-ray production code, which we will modify to facilitate the proposed research.
11212	MADAU	GLAST AND DARK MATTER SUBSTRUCTURE IN THE MILKY WAY	The detection of annihilation radiation from dark matter substructure in the halo of the Milky Way is one of the most exciting discoveries GLAST could make. We propose to conduct numerical studies of the properties, survival, and detectability of the Milky Way's dark matter substructure. Using the highest-resolution simulations to date of Galactic CDM substructure, detailed modeling of the Galactic diffuse gamma-ray emission using GALPROP, and the Pythia Monte Carlo code for annihilation spectra calculations, we will make allsky maps of the expected gamma-ray counts and address the possibility that surviving nearby subhalos may be among the brightest sources of annihilation radiation. The simulated maps will be made available to the GLAST community.
11217	TOMSICK	PROBING THE HIGH-ENERGY EMISSION OF MICROQUASARS WITH MULTI-WAVELENGTH OBSERVATIONS	With its large improvement in sensitivity, GLAST will provide a new window on studies of both supermassive and stellar mass black holes. Currently, our knowledge of the gamma-ray (>100 MeV) properties of the stellar mass variety (microquasars) is very poor. The recent detection of TeV emission from Cygnus X-1 suggests that many of these sources may be detected by GLAST. Here, we propose a multi-wavelength program to monitor several of the most likely microquasars to be seen in gamma-rays. Our program includes X-ray observations with RXTE and INTEGRAL and radio observations with Ryle and ATCA in addition to proposing (here) for 73 hours of GBT time. Only with such observations will we be able to understand the conditions necessary for the production of gamma-rays from black holes.

11221	MCSWAIN	A MULTIWAVELENGTH STUDY OF THE GAMMA-RAY BINARY LS 5039	LS 5039 is an exceptionally rare example of a HMXB with MeV-TeV emission, making it one of only three known "gamma-ray binaries". It has long been modeled as a microquasar with stellar winds accreting onto a compact object, producing high energy emission and relativistic jets. However, its emission properties might also be explained by a relativistic pulsar wind colliding with the stellar wind. To resolve the controversy, we will exploit a unique opportunity to combine GLAST monitoring with a coordinated multiwavelength campaign. Our program includes (1) an approved RXTE weekly monitoring program, (2) coordinated H-alpha spectroscopy to study the stellar wind morphology, (3) radio flux monitoring, and (4) a pulsar search with NRAO's Green Bank Telescope.
11234	KONOPELKO	A JOINT XMM-NEWTON, GLAST, MAGIC, VERITAS BROADBAND OBSERVATION CAMPAIGN OF ONE HIGH-ENERGY BLAZAR IN A MAJOR OUTBURST	The main objective of the proposed work is to perform one very intense observational campaign at X-ray, GeV, and TeV energies of one of the well-established northern sky TeV blazars, i.e., Mkn 421, Mkn 501, 1ES 1959+650, H 1426+428, and 1ES 2344+514 with XMM, GLAST, MAGIC, and VERITAS. Simultaneous broadband observations of blazars in a flaring state provide excellent test of emission models. Observations of blazars at GeV and TeV energies allow to profile the spectral shape of the high-energy component of their emission. The accurate spectral data at X-ray, GeV, and TeV energies, are needed for the flaring AGNs, in order to test whether a logically consistent leptonic, or hadronic models can be constructed for these intriguing astrophysical objects.
11235	LEISING	GLAST GBM EXPLORATORY STUDIES OF DIFFUSE EMISSION	Simple detectors operating on stable platforms for long times have proven extremely useful for studies of diffuse, low energy gamma-ray emission (e.g., SMM, BATSE, TGRS, RHESSI.) We propose to extend such studies using GLAST GBM data. The GBM has advantages of energy coverage, multiplicity of independent detectors, and environmental condition measurements over previous experiments. After one year, we expect to have a preliminary measurement of the diffuse galactic spectrum, and a clear assessment of the feasibility of GBM measurement of the cosmic background. The background models and tools needed for these studies will also be extremely useful for measurements of point-source occultation steps by others.
11239	FALCONE	MULTIWAVELENGTH OBSERVATIONS AND ANALYSIS OF BLAZARS WITH SWIFT AND GLAST: SIMULTANEOUS OPTICAL/X-RAY/GAMMA-RAY SPECTRA	This proposal aims to obtain multiwavelength data, specifically Swift (XRT, UVOT, BAT) data, on the "sources of interest" that will be monitored by GLAST and publicly released in the form of lightcurves and spectra. The proposal also aims to obtain contemporaneous Swift data during high states (defined by the GLAST-LAT team as flux > 2e-6 photons cm^-2 s^-1) from these sources or from any other new sources that exceed this threshold, thus triggering GLAST-LAT monitoring and public data release. As a Swift team member, the PI will work with the team to coordinate these observations and to maximize the science return by providing simultaneous multiwavelength observations that can be publicly accessed and analyzed.

11244	MARKOWITZ	QUANTIFYING THE GEV VARIABILITY OF BLAZARS WITH GLAST-LAT	We propose to explore the nature of GeV variability in six well-known blazars using LAT monitoring data. All targets are on the LAT Sources of Interest list. We will compare GeV variability properties of blazars to X-ray variability properties of both blazars and Seyferts, enabling us to explore links between Blazars and Seyferts in terms of variability characteristics and to probe disk-jet connections This analysis will include measuring the GeV power spectra of well-known AGN and measuring fractional variability amplitudes as a function of time and flux level.
11250	SATO	JOINT SPECTRAL ANALYSIS OF GAMMA-RAY BURSTS BETWEEN SUZAKU-WAM AND GBM	The wide energy coverage of GLAST/GBM and LAT will provide new opportunities to probe into emission mechanisms in GRBs by differentiating the features of low and high energy components. However, the GBM sensitivity in 1-30 MeV is not necessarily comparable to that of LAT at 30-100 MeV, and could affect the quality of broad-band spectral measurements. Suzaku-WAM has quite large effective area in 0.1-10 MeV and wide field of view (~2pi), which can be very effective to fill this gap. In this research program, we propose to perform a joint spectral analysis between Suzaku-WAM and GBM to determine spectral parameters of the sub-MeV component with high accuracy. WAM is also utilized to measure Epeak variability for bright GRBs.
11255	CAMILO	GREEN BANK TELESCOPE TIMING OF KEY GLAST PULSARS	Energetic rotation-powered pulsars are one of the important classes of objects to be studied with GLAST. Because the vast majority of these pulsars display great rotational instability, appropriately folding the few gamma-ray photons obtained over months-to-years will be impossible without nearly contemporaneous radio observations, and such ground-based support work is being coordinated using telescopes world-wide. About half of the top ~10 candidates for gamma-ray detection are extremely faint in radio, and require the NRAO Green Bank Telescope (GBT) for effective monitoring. The substantial GBT time required has already been awarded to our group, and we here request the support necessary to carry out the work.
11258	ROMANI	RADIO-LOUD BLAZARS: SIFTING THE DOMINANT EXTRAGALACTIC GEV POPULATION	EGRET showed that radio-bright blazars dominate the extragalactic sky; the LAT should see thousands. However, blazar science requires IDs and multi-wavelength studies. We will continue this foundational work, providing all-sky catalogs, ID algorithms and multi-nu SEDs useful for many LAT AGN studies. We will complete spectroscopy of the `best and brightest' radio-loud blazar sample, extend the BLL subset with new WIYN imaging, and model their luminosity function and evolution. We will also improve SEDs, focusing on rare high-redshift AGN (z>3 for FSRQ, z>1 for BL Lacs). Using Sy+SC/EC SED modeling of these data we will flag sources likely to have detectable LAT flares and define key coordinated observations during such flares for important (e.g. high power or high redshift) sources.

11259	READHEAD	MONITORING ~1000 GLAST BLAZARS AT 15 GHZ WITH THE OVRO 40 METER TELESCOPE	We propose a 3-year flux density monitoring campaign of ~1000 objects in the Candidate Gamma-Ray Blazar Survey - a carefully selected sample of the brightest, most active blazars, a large fraction of which are expected to be detected by GLAST. The monitoring campaign will be carried out on the OVRO 40m Telescope at 15 GHz. The ~1000 objects will be observed at least twice per week, with flux densities determined to better than 5%. In number of sources, sensitivity, and cadence, this will be by far the most powerful monitoring campaign of blazars to date. The flux densities of these sources will be made available on the web within one week of the observations, and will provide an invaluable data base for identifying, categorizing and further multi-wavelength follow-up of GLAST blazars.
11260	FOX	REDSHIFTS FOR GLAST GAMMA-RAY BURSTS	GLAST will provide the first significant sample of gamma-ray bursts (GRBs) detected to >GeV energies. The mere detection of such high-energy photons will test the physics underlying GRB theories; subsequently, detailed timing and spectral studies will aim to reveal the signature effects of quantum gravity and the extragalactic background light. All of these measurements require as input the redshifts of the associated GRBs. We propose to make the necessary ground-based observations to collect these redshifts, using an array of public and private telescopes. We anticipate collecting at least 25 redshifts for bursts detected to >GeV energies by GLAST during its first year of operations; all will be reported promptly to the community.
11268	FINGER	STUDIES OF ACCRETING BINARY PULSARS WITH THE GLAST BURST MONITOR	We propose a comprehensive study of accreting pulsars using the GLAST Burst Monitor (GBM). The full sky will be monitored daily for pulsars with spin frequencies in the 1 mHz to 2 Hz range. Software for this purpose will be developed to analyze the GBM background data based on the techniques we have used successfully with the Burst and Transient Source Experiment (BATSE) on the Compton Gamma Ray Observatory. We expect increased sensitivity compared to BATSE in the 8-30 keV range where the peak flux of these sources is usually found. We will provide quick-look estimates of pulse flux and frequency for all detectable sources through a website, and refined long-term histories will be made available to the community. Specific science studies are proposed.
11275	DERMER	EXPLORING SOURCES OF UHECRS WITH GLAST: MODELS OF GAMMA RAYS PRODUCED BY PHOTOHADRONICALLY-INDUCED PAIR-PHOTON CASCADES	Blazar AGN and GRB sources are likely to accelerate ultra-high energy cosmic rays. If they do, then a hadronically-induced gamma-ray cascade emission signature should be visible in the GLAST band. We propose to calculate detailed gamma-ray cascade radiation spectra for comparision with GLAST data. These calculations will apply to flaring and quiescent emissions, and GZK radiation. The important new feature of the calculations is the time variation of cascade parameters arising from flaring source expansion. We also propose to calculate the quiescent hard gamma-ray spectra expected to be visible with GLAST. For giant cD galaxies like Cygnus A, gamma rays are due to cascades induced at the ~100 kpc scale from UHECRs captured in the enhanced magnetic field of the cD environment.

11280	SPITKOVSKY	STUDY OF GAMMA RAY EMISSION FROM PULSARS USING REALISTIC MAGNETOSPHERIC GEOMETRY	GLAST observations of gamma-ray pulsars promise to uncover the inner workings of pulsar magnetospheres. To interpret the pulse profiles, however, all calculations of the emission from slot and outer gaps rely on the rotating vacuum dipole geometry. This geometry does not include plasma effects and is unreliable near the light cylinder. We propose to calculate the gamma ray lightcurves based on the geometry of the plasma-filled magnetosphere -- the 3D "force-free" solution. This solution is well behaved near the light cylinder and self-consistently accounts for field distortions from plasma currents. We will compare the lightcurve predictions of the slot and outer gaps in the new magnetic geometry to ascertain how GLAST observations can put constraints on the magnetospheric physics.
11282	KOCEVSKI	TIME RESOLVED SPECTRAL ANALYSIS OF GAMMA-RAY BURSTS	We propose to focus on the time resolved spectral analysis of prompt gamma-ray burst (GRB) emission detected by the GBM instrument on board the GLAST spacecraft. It is estimated that roughly 12 GRBs a year should be simultaneously detected by both the Swift and GLAST spacecrafts, with a much larger number of events detected exclusively by GLAST which will trigger subsequently XRT observations on Swift. This combination of a broad energy window to perform spectral evolution studies and a large sample of events with known redshift will represent a unique parameter set in GRB astronomy. Our analysis will concentrate on quantifying the evolution of GRB spectral parameters and how this evolution is related to source frame quantities such as the peak luminosity or total emitted energy Eiso.
11283	BAILYN	SMARTS OPTICAL/IR OBSERVATIONS OF LAT MONITORED BLAZARS	We propose to use three telescopes operated by the Small and Moderate Aperture Research Telescope System (SMARTS) at Cerro Tololo in Chile to observe all LAT monitored blazars that are accessible from Chile. The 1.3m+ANDICAM telescope will be used to obtain images in B through K band every few days; the 1.5m+RC Spec will carry out a long-term spectroscopic monitoring program of the brighter sources; the 1.0m + 4KCam will be used to study short term variability (minutes-hours) on rapidly variable sources. The data will be used to study the relationship between the emission peak in optical/IR bandpasses and the public GLAST gamma-ray emission. Data and results from the 1.3m and 1.5m telescopes will be made public on a timescale comparable to that of the LAT data on these sources.

11286	HARRISON	GRB ENERGETICS IN THE GLAST ERA	We propose a program of multiwavelength observations of GLAST GRBs aimed at providing optical and radio counterparts and light curves. The primary scientific objective of this program is to measure the total burst plus afterglow energy, key to understanding the nature of the central engine. The positions and lightcurves we obtain will also be crucial elements for GLAST to achieve other missions goals, such as measuring high-energy spectral cutoffs due to absorption by the extragalactic background light. Our experienced team will bring unique facilities and tools to bear, including the robotic P60, VLA observations, and afterglow models developed over a number of years. P60 optical positions will be broadcast immediately, enabling other observers to obtain the necessary redshifts.
11214	BARTHELMY	THE CROSS-CALIBRATION OF SWIFT-BAT AND GLAST-GBM VIA CORRELATIVE BROAD-BAND SPECTRAL ANALYSIS OF GAMMA-RAY BURSTS (GRBS)	We will perform a cross-calibration of Swift's Burst Alert Telescope (BAT) and the Gamma-Ray Large Area Space Telescope (GLAST) Burst Monitor (GLAST-GBM), resulting in joint spectral fits of gamma-ray bursts (GRBs), using the combined expertise of scientists from both instrument teams. The addition of BAT's spectral response will (i) complement in-orbit GBM calibration efforts, (ii) augment GLAST's low energy sensitivity, (iii) facilitate ground-based follow-up efforts of GLAST GRBs, and (iv) help identify a subset of GRBs discovered via off-line GBM data analysis. The proposed work would augment previous successful joint-spectral fit efforts by enabling the study of peak photon energies as well as broad-band spectral and temporal evolution of prompt GRB emission over three energy decades.
11289	GEHRELS	X-RAY AND OPTICAL FOLLOW-UP OF BRIGHT LAT GRBS WITH SWIFT	We will perform follow-up observations of GRBs detected by GLAST-LAT using Swift's XRT and UVOT instruments. We propose to develop (i) a rapid uplink GLAST/Swift communication system at the Swift-MOC to facilitate semi-autonomous dynamic XRT and UVOT re-pointing and (ii) software tools to maximize the FOV overlap between GLAST-LAT and Swift-BAT observations. These initiatives will yield >20 GRBs per year with rapid X-ray afterglow detection and arcsecond localizations. This will greatly enhance the GRB science from GLAST by providing host galaxy and redshift determination for the brightest "discovery" bursts detected by LAT. Thus, the new results on high energy burst emissions from LAT will be put in the critical context of the GRB site, progenitor, epoch and energetics.