Fermi Symposium Scientific Program

Monday October 29

Regency Grand Ballroom I, II, III

8:20-8:30	***Welcome and announcements***	
8:30-9:00	*High Energy Gamma-ray Astrophysics Through the Years*	Don Kniffen
9:00-9:30	*Fermi in Context*	Roger Blandford
9:30-10:00	*Fermi Mission Overview*	Julie McEnery
10:00-10:30	**Break**	
10:30-11:00	*Solar Flare Observations with Fermi*	Hugh Hudson
11:00-11:15	*Fermi LAT Observation of Impulsive Solar Flares*	Nicola Omodei
11:15-11:45	*Terrestrial Gamma-ray Flashes: Fermi's Emerging Role as an Excellent Storm Catcher*	Valerie Connaughton
11:45-12:00	*Multi-component analysis of bright GRB prompt emission spectra observed with Fermi*	Sylvain Guiriec
12:00-14:00	**Lunch**	
14:00-14:30	*Pulsars in the Fermi Era*	Paul Ray
14:30-14:45	*Black Widows in the Fermi Pulsar Population*	Roger Romani
14:45-15:00	*Millisecond Pulsar Discovery via Gamma-ray Pulsations*	Holger Pletsch
15:00-15:15	*Using Radio Polarimetry to Understand the Gamma-ray Emission of Pulsars*	Matthew Kerr
15:15-15:30	*Particle Acceleration and Gamma-ray Emission from Pulsars - Towards the Self-Consistent Theory*	Andrey Timokhin
15:30-16:00	**Break**	
16:00-17:30	*Poster Viewing: Diffuse/Cosmic Ray, Instrumental, PSR, SNR/PWNe, Other Galactic, Solar System* — *Regency Grand Ballroom IV, V, VI*	

See p.8-9 for talk abstracts
p.27-34 for poster abstracts.

Tuesday October 30

Regency Grand Ballroom I, II, III

8:30-9:00	*Observations of SNRs and PWNe in the Fermi Era*	Daniel Castro
9:00-9:15	*The First Fermi LAT Catalog of Supernova Remnants*	Theresa Brandt
9:15-9:30	*From Fermi to Fermi LAT: Watching Particle Acceleration in Supernova Remnants*	Damiano Caprioli
9:30-10:00	*Cosmic-rays and Fermi*	Stefano Profumo
10:00-10:30	**Break**	
10:30-10:45	*Fermi Discovers a New Population of Gamma-ray Novae*	Teddy Cheung
10:45-11:00	*Particle Acceleration and Non-Thermal Emission During The V407 Cygni Nova Outburst*	Pierrick Martin
11:00-11:15	*Three Years of Fermi GBM Earth Occultation Monitoring: Observations of Hard X-ray/Soft Gamma-ray Sources*	Peter Jenke
11:15-11:30	*Models of Hydrostatic Magnetar Atmospheres at High Luminosities*	Thijs Van Putten
11:30-12:00	*Galactic Center - Prospects for Fermi*	Frederick Baganoff
12:00-14:00	**Lunch**	
14:00-15:30	*Parallel A* — *i) Instrumentation and Analysis Methods* *ii) Pulsars*	*Regency Grand Ballroom I, II, III* *Big Sur Rooms I, II, III*
15:30-16:00	**Break**	
16:00-17:30	*Parallel B* — *i) Dark Matter and New Physics* *ii) Other Galactic*	*Regency Grand Ballroom I, II, III* *Big Sur Rooms I, II, III*

Special Session: Multiwavelength Synergies with Fermi — *Regency Grand Ballroom I, II, III*

18:00 - 18:10	*Multiwavelength Observations and Future Fermi Science*	David J. Thompson
18:10 - 18:25	*Fermi in the New Era of Radio Astronomy*	Alexander van der Horst
18:25 - 18:40	*Planck*	Isabelle Grenier
18:40 - 18:55	*The Pan-STARRS Sky Survey and Fermi*	Kent Wood
18:55 - 19:10	*NuSTAR and Fermi*	Fiona Harrison
19:10 - 19:25	*HAWC and Fermi*	Brenda Dingus
19:25 - 19:40	*Beyond Fermi: Prospects for Very High-Energy Gamma-Ray Observations with CTA*	David Williams
19:40 - 19:55	*aLIGO*	Cole Miller
19:55	*Discussion*	

See p.10-16 for talk abstracts

14:00-15:30	**Parallel A. i) Instrumentation and Analysis Methods**	**Regency Grand Ballroom I, II, III**
14:00-14:30	Luca Baldini	*The Fermi Large Area Telescope On Orbit: Validation and Calibration of the Instrument Response*
14:30-14:45	Eric Charles	*Understanding Potential Instrumental Effects in Searches for Narrow Spectral Features with the Fermi-LAT*
14:45-15:00	Andrew Chen	*Cross-Calibration of Fermi LAT and AGILE-GRID*
15:00-15:15	Shaolin Xiong	*All TTE, all the Time*
15:15-15:30	Daniela Huppenkothen	*New Methods for Timing Analysis of Transient Events, Applied to Fermi GBM Magnetar Bursts*

14:00-15:30	**Parallel A. ii) Pulsars**	**Big Sur Rooms I, II, III**
14:00-14:15	Lin Lin	*Broadband Spectroscopy of SGR J1550-5418 Bursts*
14:15-14:30	Takayuki Saito	*Observations of the Crab Pulsar and Nebula with the MAGIC Telescopes*
14:30-14:45	Kouichi Hirotani	*Luminosity Evolution of Rotation-Powered Pulsars*
14:45-15:00	Ryan Shannon	*Pulsar Timing at Parkes in Support of the Fermi Mission: Current Status and Recent Results*
15:00-15:15	Tyrel Johnson	*Search for Pulsations from PSR B1821-24 in M28 using Reprocessed Pass7 LAT Data*
15:15-15:30	Jason Wu	*The Study of Gamma-ray MSPs in the Milky Way*

15:30 - 16:00 Break

16:00-17:30	**Parallel B. i) Dark Matter and New Physics**	**Regency Grand Ballroom I, II, III**
16:00-16:15	Kevork Abazajian	*Detection of a Gamma-ray Source in the Galactic Center Consistent with Extended Emission from Dark Matter Annihilation and Concentrated Astrophysical Emission*
16:15-16:30	Chris Gordon	*Evaluating the Gamma-ray Evidence for Self-Annihilating Dark Matter from the Virgo Cluster*
16:30-16:45	Tobias Jogler	*Search for Extended Gamma-ray Emission from the Virgo Galaxy Cluster*
16:45-17:00	Elliot Bloom	*Search of the Fermi Earth Limb and Non-Galactic Center Region Data for Signs of Narrow Spectral Lines*
17:00-17:15	Alex Geringer-Sameth	*The VERITAS Dark Matter Program*
17:15-17:30	Savvas Koushiappas	*New Results of Continuum and Line WIMP Searches in Dwarf Galaxies with Fermi*

16:00-17:30	**Parallel B. ii) Other Galactic**	**Big Sur Rooms I, II, III**
16:00-16:15	Stefan Funk	*Investigation of the Pion-Decay Cutoff in Supernova Remnants*
16:15-16:30	Eduardo Striani	*The Surprising Crab Nebula*
16:30-16:45	Romain Rousseau	*Fermi LAT Observations of TeV PWNe Candidates at GeV Energies*
16:45-17:00	Lola Falletti	*Observation of the Mouse Pulsar Region with the Fermi-LAT Telescope*
17:00-17:15	Arash Bodaghee	*Observations of Cygnus X-3 and Other Microquasars with Fermi-LAT*
17:15-17:30	Giovanni Piano	*Transient Gamma-ray Emission from Cygnus X-3 Detected by AGILE: Leptonic and Hadronic Emission Models*

Wednesday October 31

Regency Grand Ballroom I, II, III

8:30-9:00	*Our Evolving Understanding of Blazars in the Fermi Era*		Justin Finke
9:00-9:30	*Blazar Observations in the Fermi Era*		Talvikki Hovatta
9:30-10:00	*Non-Blazar AGN and AGN Unification in the Fermi Era*		Jun Kataoka
10:00-10:30	**Break**		
10:30-11:00	*Observations of GRBs*		Giacomo Vianello
11:00-11:30	*Gamma-ray Burst Theory in the Fermi Era*		Dafne Guetta
11:30-12:00	*Simulations of Black Hole Accretion and Jets*		Alexander Tchekhovskoy
12:00-14:00	**Lunch**		
14:00-15:30	*Parallel C*	*i) AGN I* *ii) Diffuse/CR/Solar*	*Regency Grand Ballroom I, II, III* *Big Sur Rooms I, II, III*
15:30-16:00	**Break**		
16:00-17:30	*Parallel D*	*i) AGN II* *ii) GRB*	*Regency Grand Ballroom I, II, III* *Big Sur Rooms I, II, III*
19:00 - 22:30	Strolling Dinner, "Sushi & Satellites" *(see back cover)*		

See p.17 - 22 for talk abstracts

14:00-15:30	**Parallel C i) AGN I**	**Regency Grand Ballroom I, II, III**
14:00-14:15	Svetlana Jorstad	*Evidence of a Strong Connection Between Gamma-ray Outbursts and Events in the Millimeter-Wave Core of Blazars*
14:15-14:30	Lars Fuhrmann	*The Radio/Gamma-ray Connection: cm to Short-mm Band Radio and Gamma-ray Correlated Variability in a Large Sample of Fermi Bright Blazars*
14:30-14:45	Mahito Sasada	*Optical Photometric and Polarimetric Behaviors of Blazar Outbursts*
14:45-15:00	Emmanouil Angelakis	*F-Gamma Program: 5 Years of cm to Short-mm Monitoring of Fermi LAT Blazars*
15:00-15:15	Francesco Massaro	*Unveiling the Nature of the Unidentified Gamma-ray Source*
15:15-15:30	Matthew Baring	*Probing the Relativistic Shock Environs of Blazar Jets in the Fermi Era*

14:00-15:30	**Parallel C. ii) Diffuse/CR/Solar**	**Big Sur Rooms I, II, III**
14:00-14:15	J. Eric Grove	*A Four-Year Fermi Large Area Telescope Survey of Terrestrial Gamma-ray Flashes*
14:15-14:30	Jean-Marc Casandjian	*Precise Measure of H I Emissivity in the Solar Neighborhood*
14:30-14:45	Katsuhiro Hayashi	*Fermi LAT Study of Cosmic-rays and the Interstellar Medium in Nearby Molecular Clouds*
14:45-15:00	Fiorenza Donato	*Gamma-ray Emission from Radio Galaxies*
15:00-15:15	Jennifer Siegal-Gaskins	*A Model-Independent Method to Identify and Constrain Source Populations Using Anisotropy Analysis*
15:15-15:30	Nicola Giglietto	*Lunar Gamma-ray Emission Observed by Fermi-LAT as a Probe to Study the Solar Cycle*

15:30 - 16:00 Break

16:00-17:30	**Parallel D. i) AGN II**	**Regency Grand Ballroom I, II, III**
16:00-16:15	Benoit Lott	*Revisiting Variability of Bright Active Galactic Nuclei in the High-Energy Gamma-Ray Band*
16:15-16:30	Giovanni Fossati	*The Broken Sequence and the Torn Blazar Envelope*
16:30-16:45	Paola Grandi	*Constraining the Size and the Flare Activity of the Gamma-ray Regions in Misaligned AGN*
16:45-17:00	Giulia Migliori	*Gamma-ray Emission in Young Radio Sources: Fermi LAT Observations*
17:00-17:15	Filippo D'Ammando	*Four Years of Fermi LAT Observations of Narrow-Line Seyfert 1 Galaxies*
17:15-17:30	Raffaele D'Abrusco	*A Method for the Extraction Mid-infrared Gamma-ray Emitting Candidate Blazars*

16:00-17:30	**Parallel D. ii) GRB**	**Big Sur Rooms I, II, III**
16:00-16:15	Brian Morsony	*Photospheric Emission from Long-Duration Gamma-ray Bursts*
16:15-16:30	Veronique Pelassa	*On the Origin of the High-Energy Emission from Short Gamma-ray Bursts Observed by the Fermi GBM*
16:30-16:45	Elisabetta Bissaldi	*Duration-Energy Analysis of Bright High-Energy GRBs Detected with Fermi GBM and LAT*
16:45-17:00	Ken-Ichi Nishikawa	*Radiation from Accelerated Particles in Relativistic Jets with Shocks, Shear-low, and Reconnection*
17:00-17:15	Daniel Kocevski	*Fermi LAT Stacking Analysis of Swift Localized GRBs*
17:15-17:30	Gerard Fitzpatrick	*A Search for Extended Emission in Fermi GBM GRBs*

Thursday November 1

Regency Grand Ballroom I, II, III

8:30-9:00	*The Fermi Census: Innovation, Challenge, and Discovery in the Fermi All-Sky Survey*	Elizabeth Ferrara
9:00-9:15	*The First Fermi LAT Catalog of Sources Above 10 GeV*	David Paneque
9:15-9:30	*A Catalog of Flaring Gamma-ray Sources*	Alice Allafort
9:30-9:45	*The Fermi GBM Gamma-Ray Burst and Spectral Catalogs: Years Three & Four*	Andreas von Kienlin
9:45-10:00	*The Largest Ever Optical Spectroscopic Survey of Blazars*	Michael Shaw
10:00-10:30	**Break**	
10:30-11:00	*Non-Thermal Emission of Star-Forming Galaxies -- Status & Outlook from keV to TeV Energies*	Keith Bechtol
11:00-11:30	*Lobes, Jets and Cocoons in the Milky Way*	Douglas Finkbeiner
11:30-11:45	*Interstellar Cosmic-ray Spectrum from Gamma Rays and Synchrotron*	Charles Dermer
11:45-12:00	*Revealing Aspects of Cosmic-ray Electrons and Positrons*	Matt Kistler
12:00-14:00	**Lunch**	
14:00-14:30	*Fermi LAT Results on the Intensity and Origin of the Diffuse Extragalactic Gamma-ray Background*	Markus Ackermann
14:30-14:45	*The Extragalactic Background Light and the Detection of the Cosmic Gamma-ray Horizon*	Alberto Dominguez
14:45-15:00	*The Imprint of the Extragalactic Background Light in the Gamma-ray Spectra of Blazars*	Marco Ajello
15:00-15:15	*Extragalactic Background Light from Hierarchical Galaxy Formation: Gamma-ray Attenuation Up to the Epoch of Cosmic Reionization and the First Stars*	Yoshiyuki Inoue
15:15-15:30	*Review of the Present State of the Observational Constraints on the Extragalactic Magnetic Field*	Ievgen Vovk
15:30 - 15:45	*Unifying Black Hole Jets Across the Mass Scale*	Rodrigo Nemmen
15:45-16:00	**Break**	
16:00-17:30	*Poster Viewing: AGN, Dark Matter and New Physics, GRB, Other Extragalactic*	

Regency Grand Ballroom IV, V, VI

See p.23-25 for talk abstracts
p.35-42 for poster abstracts.

Friday November 2

Monterey Grand Ballroom

8:30-9:00	*Dark Matter and Fermi*	Lars Bergstrom
9:00-9:15	*Searching for Dwarf Spheroidal Galaxies with the Fermi LAT*	Alex Drlica-Wagner
9:15-9:30	*Constraints on Dark Matter Annihilation and Decay in the Milky Way Halo*	Gabrijela Zaharijas
9:30-9:45	*A Tentative Gamma-ray Line from Dark Matter Annihilation at the Fermi Large Area Telescope*	Christoph Weniger
9:45-10:00	*Search for Gamma-ray Spectral Lines in the Milky Way Diffuse with the Fermi Large Area Telescope*	Andrea Albert
10:00-10:30	**Break**	
10:30-10:45	*Understanding the Gamma-ray Source at the Galactic Center: 3 Convincing Stories*	Tim Linden
10:45-11:00	*Constraining Lorentz Invariance Violation with Fermi-LAT Observations of GRBs*	Vlasios Vasileiou
11:00-11:30	*Summary*	Seth Digel

See p.25 - 26 for talk abstracts

Photo credit: Peter den Hartog

Monday October 29

8:30-9:00 **Don Kniffen, (USRA)** *High Energy Gamma-ray Astrophysics Through the Years*	High Energy Gamma-ray Astrophysics Through the Years
9:00-9:30 **Roger Blandford, (Stanford/ SLAC/KIPAC)** *Fermi in Context*	Fermi in Context
9:30-10:00 **Julie McEnery** (NASA GSFC) *Fermi Mission Overview*	Fermi Mission Overview
10:30-11:00 **Hugh Hudson, (UCB)** *Solar Flare Observations with Fermi*	Solar Flare Observations with Fermi
11:00-11:15 **Nicola Omodei**, (Stanford University) Fermi Large Area Telescope collaboration *Fermi LAT observation of Impulsive Solar Flares*	The Fermi Large Area Telescope (LAT) is the most sensitive instrument ever deployed in space for observing gamma-ray emission >100 MeV. This sensitivity has enabled the LAT to detect gamma-ray emission from the sun during quiescent periods from pions produced by cosmic-ray protons interacting in the solar atmosphere and from cosmic-ray electrons interacting with solar optical photons. The LAT has detected high-energy gamma-ray emission associated with GOES M-class and X-class X-ray flares accompanied by coronal mass ejections and solar energetic particle events. In a number of cases, LAT has detected gamma rays with energies up to several hundreds of MeV during the impulsive phase and gamma rays up to GeV energies sustained for several hours after the impulsive phase. This presentation focuses on observations in the impulsive emission phase in solar flares, including the modest GOES M2-class flare at SOL2010-06-12T0057 and more recent detections, such as the bright X-class flares of March 2012.
11:15-11:45 **Valerie Connaughton** (UAHuntsville) *Terrestrial Gamma-ray Flashes: Fermi's emerging role as an excellent storm catcher*	Terrestrial Gamma-ray Flashes (TGFs) have become an unexpectedly rich area of scientific discovery for the Fermi Gamma-ray Space Telescope. The Gamma-ray Burst Monitor (GBM) observed a modest rate of one TGF per month over its first year of operation. Through a sequence of flight software enhancements and new observing modes, GBM now detects two TGFs on-board every week, with many more TGFs uncovered on the ground. This is a particularly interesting time for TGF science with observations by the Reuven Ramati High Energy Solar Spectroscopic Imager (RHESSI), the Astrorivelatore Gamma a Immagini Leggero (AGILE), and more recently by the Fermi Large Area Telescope (LAT). I will discuss global properties of TGFs observed by these instruments, before focusing on the population of TGFs observed by GBM: their intensity distribution, temporal properties, and the very close relationship between TGFs and associated radio signals detected by the World Wide Lightning Location Network
11:45-12:00 **Sylvain Guiriec**, (NASA GSFC) Fermi GBM and LAT collaborations *Multi-component analysis of bright GRB prompt emission spectra observed with Fermi*	Observations of Gamma-Ray Bursts (GRBs) with the Fermi Gamma Ray Space Telescope open a new window in the understanding of their prompt emission. With data sets from instruments prior to Fermi, GRB prompt emission spectra in the keV-MeV energy range were adequately fit with the empirical Band function, which consists of two power laws (PLs) smoothly connected at a break energy. While various works suggested deviations from this model, spectral analysis over the broad energy range of Fermi breaks this paradigm and reveals that GRB spectra are sometimes best fit with a combination of multiple components such as a Band function and a PL, a Band function and a thermal component or a Band function, a PL and a thermal component. While the parameters of the empirical Band function often challenge the physical models in the Band-only scenario, they can be more easily reconciled with synchrotron emission in the multi-component scenarios. A new era is now open, unveiling the physical processes and the dissipation mechanisms producing the prompt emission as well as the nature of the energy reservoirs powering GRB jets.

14:00-14:30 **Paul Ray, (NRL)** *Pulsars in the Fermi Era*	Pulsars in the Fermi Era
14:30-14:45 **Roger Romani** (Stanford/KIPAC) *Black Widows in the Fermi Pulsar Population*	Fermi's success at finding pulsars is eclipsed by its success at finding evaporating (black-widow-type) millisecond pulsars. I summarize the current Fermi black widow sample, the evidence that there are more black widows hidden in the unidentified sources and the prospects for further black widow discovery. These results clear up some misconceptions about black widows from the pre-Fermi era and improve our understanding of pulsar evolution. But even more importantly some of these binaries, e.g. J1311-3430, have outrageous parameters and promise new probes of extreme pulsar physics.
14:45-15:00 **Holger Pletsch** (Max Planck Institute for Gravitational Physics (Albert Einstein Institute)) *Millisecond Pulsar Discovery Via Gamma-Ray Pulsations*	Millisecond pulsars (MSPs) have high rotation rates of hundreds of Hertz, a result from spinning up an old neutron star by acquiring mass and angular momentum from a companion. Until this time, all such "recycled" rotation-powered pulsars have been discovered by their spin-modulated radio emission. The Fermi LAT confirmed that many radio-detected MSPs are also bright gamma-ray emitters by using the radio ephemeris. The LAT also provides for the first time sufficient sensitivity to detect many new pulsars via direct searches for periodicity in the sparse gamma-ray photons. However, blind searches for MSPs in gamma-ray data are computationally vastly more involved than for slower pulsars because the search must extend to much higher spin frequencies. Furthermore, most MSPs are in binary systems, where the additionally unknown orbital parameters can increase the computational complexity of a blind search by orders of magnitude. I describe solutions to this computing challenge and present first results of a blind binary-MSP search of LAT data. The direct MSP detection from gamma-ray data opens up new possibilities for studies of extreme binary pulsars which are too radio faint to be found in typical radio searches.
15:00-15:15 **Matthew Kerr**, (Stanford University) Simon Johnston (ATNF) *Using Radio Polarimetry to Understand the Gamma-ray Emission of Pulsars*	Pulsar magnetospheres are geometrically simple, and observables are largely determined by two unknown parameters: ζ(α), the observer's (magnetic dipole axis') inclination to the pulsar's spin axis. By exploiting the tendency for radiation to be beamed along magnetic field lines, gamma-ray light curves can be used to infer the position and extent of the emitting volume. However, degeneracy with ζ and α prevents a unique determination. This degeneracy can be broken—or at least ameliorated—by applying constraints on α and ζ obtained from radio polarimetry. To support the search for gamma-ray pulsars, the Parkes radio telescope has performed monthly timing observations of 160 high Edot pulsars for nearly 5 years. Co-added, these data yield high signal-to-noise, calibrated polarimetry. We present the constraints obtained from a uniform analysis of the polarimetry and discuss the implications for the population and for particularly well-constrained pulsars.
15:15-15:30 **Andrey Timokhin** (NASA GSFC) *Particle acceleration and gamma-ray emission from pulsars - towards the self-consistent theory.*	Recently it became obvious that the standard quantitative models of pair plasma generation and high energy gamma-ray emission from pulsars are fundamentally incompatible with the magnetosphere models, which required a thorough revision of these models starting from first principles. I will briefly overview the current state of the pulsar magnetosphere models and efforts of self-consistent modeling of electron-positron plasma generation in pulsars. I will report on results of truly self-consistent simulations of particle acceleration and electron-positron pair creation in pulsar magnetospheres, when particle acceleration, photon emission and propagation, pair production and screening of the electric field are calculated simultaneously and under the requirement of providing current density compatible with the global magnetosphere models. These results show that particle acceleration proceeds qualitatively different than in up to now "standard" stationary models which has profound implications on interpretation of observed high energy emission from pulsars. I discuss implications of this self-consistent particle acceleration model for pulsar gamma-ray emission observed by Fermi.
16:00-17:30 *Poster Viewing*	Diffuse/Cosmic Ray, Instrumental, PSR, SNR/PWNe, Other Galactic, Solar System

Tuesday October 30

8:30-9:00 **Daniel Castro**, (CfA) *Observations of SNRs and PWNe in the Fermi Era*	Observations of SNRs and PWNe in the Fermi Era
9:00-9:15 **Theresa Brandt**, (NASA GSFC) F. Acero, F. de Palma, F. Giordano, J. Hewitt, on behalf of the Fermi LAT Collaboration *The First Fermi LAT Catalog of Supernova Remnants*	The Fermi Gamma-ray Space Telescope has shed new light on many types of galactic objects, including Supernova Remnants (SNRs). With over 15 SNRs identified to date and over 40 candidates in the 2nd LAT Catalog (2FGL), we are beginning to have sufficient numbers of objects to perform GeV SNR population studies. Moreover, with the wealth of multiwavelength (MW) data available, we can now characterize in a uniform and consistent manner the GeV emission in all regions containing known SNRs. This permits the first systematic study of SNRs including GeV data, allowing us to classify SNRs and to separate effects of evolution and environment. In combination with MW data, we can constrain emission models of the underlying particle populations, allowing us to quantify both SNR characteristics and SNRs' aggregate contribution to Galactic cosmic rays in a statistically significant manner. We will present progress towards the SNR catalog and preliminary results, including an emerging distinction between young SNRs and those interacting with denser media and indications of a radio-gamma correlation for the latter.
9:15-9:30 **Damiano Caprioli** (Princeton University) *From Fermi to Fermi LAT: watching particle acceleration in supernova remnants*	Supernova remnants (SNRs) have been regarded for many decades as the sources of Galactic cosmic rays (CRs) up to a few PeV. However, only with the advent of Fermi LAT it has been possible to detect — at least in some SNRs— gamma-rays whose origin is clearly hadronic, namely due to the decay of neutral pions produced by collision between relativistic nuclei and the background plasma. When coupled with observations in other bands (from radio to TeV gamma-rays), Fermi LAT data typically present evidence for CR spectra significantly steeper than the standard prediction of the popular Fermi mechanism, forcing us to rethink our theoretical understanding of efficient particle acceleration at strong shocks. We outline how including the effects a CR-triggered magnetic field amplification it is possible to reconcile non-linear models for diffusive shock acceleration with recent gamma-ray observations, in particular providing a successful application of such a theory to Tycho's SNR.
9:30-10:00 **Stefano Profumo**, *(UCSC)* *Cosmic-rays and Ferm*	Cosmic-rays and Fermi
10:30-10:45 **Teddy Cheung**, (NRC/NRL) On behalf of the Fermi LAT collaboration *Fermi Discovers a New Population of Gamma-ray Novae*	Novae had not been widely considered as high-energy (>100 MeV) gamma-ray sources prior to the launch of the Fermi Large Area Telescope (LAT). In March 2010, the LAT made the first gamma-ray detection of a nova in the symbiotic binary V407 Cygni. The LAT observations uniquely probed the high-energy particle accleration mechanism in the environs of the V407 Cyg binary system consisting of a white dwarf and massive (red giant) companion. Subsequently in June 2012, two more examples were discovered, Nova Sco 2012 and Nova Mon 2012, thus heralding novae as a new gamma-ray source class. In the latter case, the gamma-ray transient source was discovered first, followed by the optical confirmation of the nova. This showcases the all-sky monitoring capability of the LAT, and how novae can be found independently from traditional optical searches. We discuss the LAT detected gamma-ray novae together with observational limits on other optical novae over the first four years of the Fermi mission and reconsider the possible high-energy gamma-ray production mechanisms in novae in light of the new detections.

10:45-11:00 **Pierrick Martin**, (IPAG) Guillaume Dubus *Particle acceleration and non-thermal emission during the V407 Cygni nova outburst*	On March 2010, the symbiotic binary V407 Cyg erupted as a result of a nova explosion. The event gave rise to a two-week long burst of >100MeV gamma-rays detected by Fermi LAT, a unique observation testifying to particle acceleration in the system. The outburst can be considered a scaled-down supernova, with short dynamical time scale, and thus can constitute a test case for theories of the origin of galactic cosmic rays. We developed a model for diffusive shock acceleration and non-thermal emission in V407 Cyg, complemented by an evaluation of the thermal emission from the shocked plasma. We considered both leptonic and hadronic contributions to the non-thermal processes, and investigated the effect of many binary and nova parameters. From the comparison to gamma-ray, X-ray and radio data, we obtain estimates for the maximum particle energies, the non-thermal energy budget, the relative contribution of electrons and protons to the emission, and the geometry of the binary system. We consider another similar event, the 2006 outburst of RS Oph, and then evaluate the contribution of novae in symbiotic systems to the Galactic cosmic rays, and the prospects for future detections of such objects in high-energy gamma-rays. Last, we discuss the possible origin of gamma-ray emission from classical novae and in particular the recently detected Nova Sco 2012.
11:00-11:15 **Peter Jenke**, (MSFC/NPP) (Colleen A. Wilson-Hodge, et al. *Three years of Fermi GBM Earth Occultation Monitoring: Observations of Hard X-ray/Soft Gamma-Ray Sources*	The Gamma ray Burst Monitor (GBM) on board Fermi Gamma-ray Space Telescope has been providing continuous data to the astronomical community since 2008 August 12. We will present the results of the analysis of the first three years of these continuous data using the Earth occultation technique to monitor a catalog of 209 sources. Although the occultation technique is in principle quite simple, in practice there are many complications including the dynamic instrument response, source confusion, and scattering in the Earth's atmosphere, which will be described. We detect 99 sources, including 40 low-mass X-ray binary/neutron star systems, 31 high-mass X-ray binary/neutron star systems, 12 black hole binaries, 12 active galaxies, 2 other sources, plus the Crab Nebula and the Sun. Nine of these sources are detected in the 100-300 keV band, including seven black-hole binaries, the active galaxy Cen A, and the Crab. The Crab and Cyg X-1 are also detected in the 300-500 keV band. GBM provides complementary data to other sky monitors below 100 keV and is the only all-sky monitor above 100 keV. In our fourth year of monitoring, we have already increased the number of transient sources detected and expect several of the weaker persistent sources to cross the detection threshold. I will briefly discuss these new sources and what to expect from our five year occultation catalog.
11:15-11:30 **Thijs Van Putten**, (University of Amsterdam) A. L. Watts, C. R. D'Angelo, M. G. Baring and C. Kouveliotou *Models of hydrostatic magnetar atmospheres at high luminosities*	I discuss the possibility of Photospheric Radius Expansion (PRE) during magnetar bursts. Identification of PRE would enable a determination of the magnetic Eddington limit (which depends on field strength and neutron star mass and radius), and shed light on the burst mechanism. This work is inspired by a Fermi GBM observation of a burst of the magnetar SGR 0501+4516 on 2008 August 24, which showed a double peaked light curve reminiscent of PRE in thermonuclear X-ray bursts. To investigate whether PRE could occur in magnetar bursts, we have modeled hydrostatic atmospheres in a strong radial magnetic field, determining both their maximum extent and photospheric temperatures. We find that spatially-extended atmospheres cannot exist in such a field configuration: typical maximum extent for magnetar-strength fields is 10m (as compared to 200 km in the non-magnetic case). Achieving balance of gravitational and radiative forces over a large range of radii, which is critical to the existence of extended atmospheres, is rendered impossible in strong fields due to the dependence of opacities on temperature and field strength. We conclude that high luminosity bursts in magnetars does not lead to expansion and cooling of the photosphere, as in the non-magnetic case. We also find the maximum luminosity that can propagate through a hydrostatic magnetar atmosphere to be lower than previous estimates. We find that the photospheres associated with the two different polarization modes are always very close together, both spatially and in temperature. This has implications for the interpretation of spectral fits of Fermi GBM data, which are often well described by two black bodies. Our results show that these two black bodies cannot be ascribed to extended photospheres.
11:30-12:00 **Frederick Baganoff**, (MIT) *The Galactic Center Region - Prospects for Fermi*	The Galactic Center Region - Prospects for Fermi

14:00-15:30	**Parallel A. i) Instrumentation and Analysis Methods**	**Tuesday October 30**

14:00-14:30
Luca Baldini
(Università di Pisa and INFN-Pisa)
E. Charles and R. Rando on behalf of the Fermi LAT collaboration

The Fermi Large Area Telescope On Orbit: Validation and Calibration of the Instrument Response

We describe the performance of the Fermi LAT instrument in the context of the Pass 7 event selection. Pass 7 was developed by the LAT team based on the experience gained in the first years of operation and was released to the public in August 2011. We discuss the on-orbit effects that motivated updating the pre-launch data reduction process and describe the corrections that we apply to the Monte Carlo-derived Instrument Response Functions (IRFs) to account for the discrepancies observed between flight and simulated data. We also give details of the validations performed using flight data and quantify the residual uncertainties in the IRFs. Finally, we describe techniques that the LAT team has developed to propagate those uncertainties into estimates of the systematic errors on common measurements such as fluxes and spectra of astrophysical sources.

14:30-14:45
Eric Charles, (SLAC)
On behalf of the Fermi LAT collaboration

Understanding Potential Instrumental Effects in Searches for Narrow Spectral Features with the Fermi LAT

Recently, there has been considerable excitement over results showing one or more narrow features in the spectra of gamma rays coming from the region of the Galactic Center. In this presentation, we will point out aspects of the instrument response at 130 GeV that could potentially give rise to an apparent excess of events in a narrow energy band, in particular, the pertinent aspects of our event reconstruction, event selection and energy assignment algorithms. We will describe studies that can be used to distinguish between instrumental and astrophysical signatures, and rule out many potential instrumental causes. Finally, we will discuss how instrumental uncertainties should inform strategies in line searches.

14:45-15:00
Andrew Chen, (INAF - IASF Milano)
et al.

Cross-Calibration of Fermi LAT and AGILE-GRID

We present a cross-calibration of Fermi LAT and AGILE-GRID. Using analysis of simultaneous observations at both very long and very short time scales of gamma-ray pulsars including Vela and B1509-58, we compare the light curves, fluxes, and spectra obtained by the two instruments. We pay particular attention to the effects at low energies of both energy dispersion and the steep change in effective area as a function of energy.

15:00-15:15
Shaolin Xiong, (University of Alabama in Huntsville)
Michael S. Briggs, Valerie Connaughton

All TTE, all the Time

Time-Tagged Event (TTE) data, with 2 microsecond time resolution and 128 energy channels, is the most informative data for Gamma-Ray Burst Monitor (GBM) on-board the Fermi space telescope. Limited by the downlink bandwidth, the standard continuous data are binned in either 0.256 s or 4.096 s, and TTE data is enabled only for 330 s when GBM is triggered. The on-board trigger time scale (≥ 16 ms) makes GBM relatively insensitive to short transient sources with duration less than tens of ms, like Terrestrial Gamma-ray Flashes (TGF) and weaker Short Gamma-Ray Bursts (sGRBs), and makes finding short-period pulsars in continuous data difficult. To further extend the scientific output of GBM, thanks to improvements in flight software, in the data processing pipeline, and extra downlinks, we have begun operating in a new mode where TTE data is collected for the whole orbit. With such continuous TTE data, a ground search can be implemented on time scales finer than 16 ms, which will result in finding more TGFs and sGRBs. The TGF detection rate is estimated to be 900/year, an order of magnitude improvement in sensitivity over the onboard trigger rate. The ability to discover weaker sGRBs will increase the number of gamma-ray counterparts GBM can provide for gravitational wave detections by Advanced LIGO/Virgo after 2015.

15:15-15:30
Daniela Huppenkothen, (Astronomical Institute Anton Pannekoek, University of Amsterdam)
A.L. Watts, P. Uttley and the Fermi GBM Magnetar Collaboration

New Methods for Timing Analysis of Transient Events, Applied to Fermi GBM Magnetar Bursts

In order to discern the physical nature of many gamma-ray sources in the sky, we must look not only in spectral and spatial dimensions, but also understand their temporal variability. However, timing analysis of sources with a highly transient nature, such as magnetar bursts, is difficult: standard Fourier techniques developed for long-term variability generally observed, for example, from AGN often do not apply. Here, we present newly developed timing methods applicable to transient events of all kinds, and show their successful application to magnetar bursts observed with Fermi GBM. Magnetars are a prime subject for timing studies, thanks to the detection of quasi-periodicities in magnetar Giant Flares and their potential to help shed light on the structure of neutron stars. Using state-of-the art statistical techniques, we search for quasi-periodicities (QPOs) in a sample of bursts observed with Fermi GBM and provide upper limits for potential QPO detections. Additionally, for the first time, we characterise the broadband variability behaviour of magnetar bursts and highlight how this new information could provide us with another way to probe these mysterious objects.

14:00-14:15
Lin Lin, (Sabanci University)
Ersin Gogus et al.

Broadband Spectroscopy of SGR J1550-5418 Bursts

We present our broadband spectral investigations of 42 SGR J1550-5418 bursts simultaneously detected with the Fermi/Gamma-ray Burst Monitor (GBM) and the Swift X-ray Telescope (XRT), during the 2009 January active episode of the source. The unique spectral and temporal capabilities of GBM and XRT have allowed us to study the burst spectra in a very wide energy band (0.5-200 keV). We find that, on average, SGR burst spectra are better described with two blackbody functions than with the Comptonized model. Thus, our joint XRT-GBM analysis clearly shows for the first time that the SGRJ1550-5418 burst spectra might naturally be expected to exhibit a more truly thermalized character, such as a two-blackbody or even a multi-blackbody signal. Our joint spectral fits also provide an opportunity to investigate the cross-calibration of the XRT and GBM instruments with the two spectral models. Finally, we show that the distribution of the XRT burst counts with spin phase is not uniform and not correlated with the persistent X-ray emission pulse phase of SGRJ1550-5418. This indicates that the surface magnetic field of SGRJ1550-5418 is not uniform over the emission zone and the burst emitting sites on the neutron star need not to be co-located with hot spots emitting the bulk of the persistent X-ray emission.

14:15-14:30
Takayuki Saito, (Max-Planck-Institut fuer Physik)
P. Colin, G. Giavitto, K. Hirotani, S. Klepser, D. Mazin, T. Schweizer, R. Zanin

Observations of the Crab Pulsar and Nebula with the MAGIC Telescope

In the past few years, unexpected natures of one of the best studied astronomical objects, Crab, were discovered. The energy spectrum of the Crab pulsar measured by Fermi LAT up to 30 GeV was consistent with the conventional theories predicting an exponential cutoff around a few GeV, while MAGIC measurements above 25 GeV and VERITAS measurements above 100 GeV revealed a surprising power-law-like tail up to 400 GeV, smoothly connected with Fermi LAT measurements. On the other hand, the pulsar wind nebula of Crab, whose bright and steady emission have been used as a standard candle in many energy bands, showed a flaring activities in GeV band as detected by Fermi LAT and AGILE. MAGIC observed the Crab nebula during one of the GeV flares in April 2011, finding no significant flux enhancement above 700 GeV. Here we report on the details of the MAGIC observations of the Crab pulsar and nebula. For the pulsar, we also discuss the energy dependence of the pulse profile and theoretical interpretations of the power-law-like spectrum. For the nebula, in addition to the measurements during the GeV flare period, we discuss the average spectrum from 50 GeV to 45 TeV, which leads to precise determination of the IC peak combined with Fermi LAT measurements.

14:30-14:45
Kouichi Hirotani, (TIARA/ASIAA)

Luminosity Evolution of Rotation-Powered Pulsars

In the HE/VHE regimes, the Fermi, VERITAS and MAGIC experiments have detected pulsed signals from the Crab pulsar upto 400 GeV. The light curves and the spectra obtained from the Crab and other rotation-powered pulsars, suggest that the gamma-ray pulsars have high-altitude emission zones, which avoid super-exponential cutoff due to magnetic pair production and reproduce wide-separated double-peak light curves. I thus examine the outer-magnetospheric emission model and analytically demonstrate that their gamma-ray luminosity is naturally proportional to the square root of the spin-down luminosity, which is consistent with the Fermi observations. I further confirm this analytical prediction by numerically solving the emission zone of typical pulsars from the set of Maxwell and Boltzmann equations. Finally, I show that young pulsars with ages around 3000 years exhibit relatively strong, pulsed, inverse-Compton emission component in 0.3-10 TeV, and discuss their detectability with the current and future ground-based Imaging Air Cherenkov Telescopes.

14:45-15:00
Ryan Shannon, (CSIRO Astronomy and Space Science)
Simon Johnston (CSIRO) and Michael Keith (CSIRO)

Pulsar Timing at Parkes in Support of the Fermi Mission: Current Status and Recent Results

Since the launch of Fermi, over 160 young, energetic pulsars have been regularly observed with 64 metre Parkes radio telescope, with the primary goal being to provide accurate ephemerides necessary to produce phase-resolved gamma-ray light curves. Here we summarize the current status and recent results of this pulsar timing program. In particular, we highlight timing analysis of PSR B1259-63, a pulsar with a Be star companion. We combine our observations of PSR B1259-63 with archival observations and show for the first time convincing evidence of spin-orbit coupling in this binary system. We also discuss efforts to correlate both glitch events and timing noise with changes in radio and gamma-ray emission.

15:00-15:15
Tyrel Johnson, (NRC Fellow at NRL)
P. S. Ray and I. Cognard on behalf of the Fermi LAT Collaboration and Pulsar Timing Consortium

Search for Pulsations from PSR B1821-24 in M28 using Reprocessed Pass7 LAT Data

The Fermi LAT collaboration has recently reprocessed the first 4 years of data using improved instrument calibration constants. As of today, these new data are still being validated and part of that process involves the re-analysis of known sources. While the main improvement expected from the reprocessing is in the >10 GeV angular resolution, we did find an increased number of events with the SOURCE classification, many of which survive to the CLEAN event class, in the energy range from a few hundred MeV to few GeV, the sweet spot for pulsar studies. We thus searched for pulsations from PSR B1821-24 in the globular cluster M28, the most energetic rotation-powered millisecond pulsar known. Using the new data and result of the pulsation search we reevaluate limits on the number of millisecond pulsars in M28. Portions of this research performed at NRL are sponsored by NASA DPR S-15633-Y.

15:15-15:30
Jason Wu, (National Tsing Hua University)
Albert Kong, David Hui, Eric Wu, Regina Huang, K.S. Cheng

The Study of Gamma-ray MSPs in the Milky Way

Millisecond pulsars (MSPs) are fast spinning neutron stars with spin periods of a few milliseconds, that have been confirmed by the Fermi LAT as a class of gamma-ray emitters. During over four years of operation, Fermi LAT has detected over 30 MSPs, these gamma-ray emitting MSPs can be found in various environments (e.g., globular cluster, galactic field). By studying the gamma-ray properties of MSPs in different environments, we can have a better understanding on the recycling process of MSPs formation as well as the emission mechanisms. We present our latest findings on gamma-ray emitting MSPs in the Fermi era.

16:00-17:30	Parallel B. i) Dark Matter and New Physics	Tuesday October 30
16:00-16:15 **Kevork Abazajian**, (University of California, Irvine) Manoj Kaplinghat *Detection of a Gamma-ray Source in the Galactic Center Consistent with Extended Emission from Dark Matter Annihilation and Concentrated Astrophysical Emission*	We show the existence of a statistically significant, robust detection of a gamma-ray source in the Milky Way Galactic Center that is consistent with a spatially extended signal using about 4 years of Fermi LAT data. The gamma-ray flux is consistent with annihilation of dark matter particles with a thermal annihilation cross-section if the spatial distribution of dark matter particles is similar to the predictions of dark matter only simulations. We find statistically significant detections of an extended source with gamma-ray spectrum that is consistent with dark matter particle masses of approximately 10 GeV to 1 TeV annihilating to Bbar-B quarks, and masses approximately 10 GeV to 30 GeV annihilating to τbar-τ leptons. However, a part of the allowed region in this interpretation is in conflict with constraints from Fermi observations of the Milky Way satellites. The biggest improvement over the fit including just the point sources is obtained for a 30 GeV dark matter particle annihilating to Bbar-B quarks. The gamma-ray intensity and spectrum are also well fit with emission from a millisecond pulsar (MSP) population following a density profile like that of low-mass X-ray binaries observed in M31. The greatest goodness-of-fit of the extended emission is with spectra consistent with known astrophysical sources like MSPs in globular clusters or cosmic ray bremsstrahlung on molecular gas. Therefore, we conclude that the bulk of the emission is likely from an unresolved or spatially extended astrophysical source. However, the interesting possibility of all or part of the extended emission being from dark matter annihilation cannot be excluded at present.	
16:15-16:30 **Chris Gordon**, (University of Canterbury) Oscar Macías-Ramírez, Anthony M. Brown, and Jenni Adams *Evaluating the Gamma-ray Evidence for Self-Annihilating Dark Matter from the Virgo Cluster*	Based on three years of Fermi Large Area Telescope (LAT) gamma-ray data of the Virgo cluster, evidence for an extended emission associated with dark matter pair annihilation has been reported (Han et al. 2012). After an in depth spatial and temporal analysis, we argue that this signal is mainly due to the appearance of a population of previously unresolved gamma-ray point sources in the region of interest that were not part of the LAT second source catalog.	
16:30-16:45 **Tobias Jogler**, (SLAC/KIPAC) Keith Bechtol, Stefan Funk, Stephan Zimmer, Jan Conrad on behalf of the Fermi LAT collaboration *Search for Extended Gamma-ray Emission from the Virgo Galaxy Cluster*	Galaxy clusters are prime candidate sites to search for gamma-ray emission either from cosmic-ray interactions and/or dark matter annihilation. Despite extensive searches no gamma-ray emission could be traced to any galaxy cluster. Recently claims of extended gamma-ray emission found in the Fermi LAT data from the Virgo galaxy cluster were reported by Han et al. They attributed the putative gamma-ray emission to dark matter annihilation. In more recent works by the same authors and Marcias-Ramirez et al a high number of newly identified point sources was suggested to explain the "extended" gamma-ray excess. Here we present a detailed study of the Virgo region conducted by the Fermi collaboration. We show that the excess can be described by either an extended source offset from the Virgo galaxy cluster center or by a high number of point sources inside or in the vicinity of the extended source. We compare both scenarios and investigate which one yield the more plausible explanation.	
16:45-17:00 **Elliot Bloom**, (KIPAC-SLAC, Stanford University) Arthur Snyder, Andrea Albert, Brian Winer for the Fermi LAT Collaboration) *Search of the Fermi Earth Limb and Non-Galactic Center Region Data for Signs of Narrow Spectral Lines*	Since the spring of 2012 there have been many papers published using Fermi LAT public data that claim evidence for narrow spectral lines coming from the region of the Galactic center. This study uses non-Galactic center Fermi LAT data from survey mode observations, and Earth limb Fermi data to test the dark matter interpretation of this feature and better understand its origins.	
17:00-17:15 **Alex Geringer-Sameth**, (Brown University) The VERITAS collaboration *The VERITAS Dark Matter Program*	The VERITAS array of Cherenkov telescopes, designed for the detection of very high energy gamma rays in the 100 GeV-10 TeV energy range, performs dark matter searches over a wide variety of targets. VERITAS continues to carry out focused observations of dwarf spheroidal galaxies in the Local group, the Milky Way galactic center, and Fermi LAT unidentified GeV sources. This presentation reports on our extensive observations of these targets, new statistical techniques, and current constraints on dark matter particle physics derived from these observations.	
17:15-17:30 **Savvas Koushiappas**, (Brown University) Alex Geringer-Sameth *New Results of Continuum and Line WIMP Searches in Dwarf Galaxies with Fermi*	I will present new results from a search for both line and continuum emission from WIMP annihilation in Milky Way dwarfs using Fermi data. These results are derived using a new framework based on the statistically optimal weighting of each photon including both spatial and spectral information. The combination of four years of Fermi data and the novel analysis techniques are powerful enough to probe generic WIMP candidates that reproduce the relic abundance.	

16:00-17:30 Parallel B. i) Dark Matter and New Physics	Tuesday October 30
16:00-16:15 **Stefan Funk**, (SLAC) Yasunobu Uchiyama, Taka Tanaka for the Fermi LAT collaboration *Investigation of the Pion-Decay Cutoff in Supernova Remnants*	Supernova remnants have long been suspected of accelerating cosmic ray protons, but unambiguous proof is still lacking. One clear prediction of this scenario is the existence of a low-energy (pion-bump) cutoff in the spectra of hadronically produced gamma rays at 67MeV. The Fermi LAT provides unprecedented sensitivity in the energy range below 200 MeV and thereby has access to this feature. We present first results of a search for the pion-decay cutoff in bright SNRs with the Fermi LAT.
16:15-16:30 **Eduardo Striani**, (INAF-IAPS Roma & Univeristy of Rome Tor Vergata) M. Tavani, V. Vittorini *The Surprising Crab Nebula*	The Crab Nebula, with its powerful pulsar, is the remnant of a supernova explosion observed in 1054. The Nebula emission for energies ranging from radio to gamma rays (up to 100 MeV) is dominated by synchrotron radiation of electrons accelerated by the pulsar, and shows a cutoff around 100-200 MeV. Because of its very stable emission, the Crab Nebula was considered a calibrator for High Energy Astrophysics telescopes. A big surprise was the discovery by the AGILE satellite of a gamma-ray flare from the Crab Nebula in September 2010, with a sub-day timescale, and a peak emission beyond the steady state emission. Four major gamma-ray flares have been detected by AGILE and Fermi from mid-2007 until now. The discovery of fast and efficient gamma-ray transient emission from the Crab Nebula leads to substantially revise the current models of particle acceleration. The 2007 gamma-ray flare observed by AGILE shows the evidence of two different types (fast and slow) of enhanced gamma-ray emission. The presence of these two components is found also in the Fermi data with a χ^2 analysis of the whole data set: several episodes above 5 σ from the Crab average emission (beside the major flares) were found, with a duration ranging from few days up to more than one month. I will discuss the evidence of the fast and slow components of enhanced gamma-ray emission in the AGILE and Fermi data, and the four major flares detected by the two telescopes.
16:30-16:45 **Romain Rousseau**, (CENBG/ IN2P3/ CNRS/ Universite Bordeaux 1) J. Lande, S. Funk, M. Lemoine-Goumard *Fermi LAT Observations of TeV PWNe Candidates at GeV Energies*	Pulsar wind nebulae (PWNe) are the most populous class of sources observed in the TeV energy range, followed by a large sample of unidentified sources (UNID). With its unmatched sensitivity in the GeV energy range, the Fermi Gamma-ray Space Telescope has already detected seven pulsar wind nebulae (PWNe), all of them being linked to a TeV source. In this context, we have analyzed more than three years of Fermi LAT observations to look for GeV counterparts to all 56 potential PWNe (known PWNe + UNID) observed by the TeV experiments. For each of them a gamma-ray flux or an upper limit was derived above 10 GeV. The wealth of multi-wavelength data available and the new results provided by Fermi offer an extraordinary opportunity to constrain the origin of the gamma-ray emission of the large sample of UNID and the radiative processes taking place in known PWNe. We will discuss these new results in detail, focusing on the newly detected sources.
16:45-17:00 **Lola Falletti**, (LUPM) J. Cohen-Tanugi, E. Nuss *Observation of the Mouse Pulsar Region with the Fermi LAT Telescope*	The Mouse pulsar wind nebula and its vicinity is a complex region for GeV-TeV gamma-ray astronomy, dominated by intense diffuse Galactic emission background and a dense population of potential gamma-ray emitters, such as dense molecular clouds, supernova remnants, X-ray binaries and pulsars. Thanks to its large effective area and an all-sky survey observation, the Fermi Large Area Telescope has collected a high-statistics sample of gamma rays in the GeV energy range from this region, located in projection ~1 deg from the Galactic Center. In this study, we review the Fermi LAT observations of this region and discuss their possible relation to the TeV extended source HESS J1745-303. We discuss the interpretation of the GeV/TeV observations in terms of Very High Energy contributions, such as supernova remnant-molecular cloud interactions and/or high-spin-down flux pulsars..
17:00-17:15 **Arash Bodaghee**, (University of California, Berkeley) John Tomsick, Jerome Rodriguez, Katja Pottschmidt, Joern Wilms, Guy Pooley *Observations of Cygnus X-3 and Other Microquasars with Fermi LAT*	The accreting black holes in microquasars are considered to be scaled-down versions of active galactic nuclei since both share similar emission processes and radio jets. While their larger brethren are easily detected in the gamma-rays constituting a significant fraction of the 2FGL catalog, only a handful of microquasar candidates have been unambiguously detected above 100 MeV. First, we present results from Fermi LAT observations of one of these gamma-ray detected microquasars: Cyg X-3. Using multi-wavelength data, we illustrate the sequence of events before and after the gamma-ray flares of May 2010 and February 2011 to show that the high-energy emission is related to the appearance and disappearance of radio emission suggesting a link between accretion and the jets. Then, we extend our analysis to search for gamma-ray emission from the microquasars Cyg X-1, GRS 1915 + 105, and GX 339 - 4. Analysis of the first four years of Fermi observations of these sources indicates no significant detections > 4 σ above 100, MeV on timescales of 0.1, 1, 10,days, and longer. Upper limits are provided on the 0.1--10-GeV flux from these sources. We discuss the orbital-phase folded gamma-ray light curves, and what the non-detections imply in the context of leptonic/hadronic models for high-energy emission. We close with prospects for increasing the sensitivity in our search for these elusive gamma-ray transients.
17:15-17:30 **Giovanni Piano**, (INAF-IAPS) V. Vittorini, A. Giuliani, M. Tavani *Transient Gamma-ray Emission from Cygnus X-3 Detected by AGILE: Leptonic and Hadronic Emission Models*	The AGILE satellite detected several episodes of transient gamma-ray emission from Cygnus X-3. Cross-correlating the AGILE light curve with both X-ray and radio monitoring data, we find that the main events of gamma-ray activity were detected while the system was in soft spectral X-ray states, that coincide with local and often sharp minima of the hard X-ray flux, a few days before intense radio outbursts. This repetitive temporal coincidence between the gamma-ray transient emission and spectral state changes of the source turns out to be the spectral signature of gamma-ray activity from this microquasar. The gamma-ray differential spectrum of Cygnus X-3 (100 MeV – 3 GeV), which was obtained by averaging the data collected by AGILE during the gamma-ray events, is consistent with a power law of photon index $\alpha=2.0 \pm 0.2$. Finally, we examined leptonic and hadronic emission models for the gamma-ray activity and found that both scenarios are valid. In particular, in the leptonic model – based on inverse Compton scatterings of mildly relativistic electrons on soft photons from both the Wolf-Rayet companion star and the accretion disk -- the emitting particles may also contribute to the overall hard X-ray spectrum, possibly explaining the hard non-thermal power-law tail seen during special soft X-ray states in Cygnus X-3.

Special Session: Multiwavelength Synergies with Fermi

18:00-18:10 **David J. Thompson,** (NASA GSFC) *Multwavelength Observations and Future Fermi Science*	Multiwavelength Observations and Future Fermi Science
18:10 - 18:25 **Alexander van der Horst**, (University of Amsterdam) *Fermi in the New Era of Radio Astronomy*	In the next few years a suite of new facilities will start observing the radio sky with fields of view, sensitivities and bandwidths which have not been available before. Some observatories will explore the low-frequency radio sky down to tens of Megahertz with unprecedented sensitivity and high spatial, spectral and temporal resolution. I will discuss the synergy of these new radio telescopes with Fermi and what we can learn from observing some of the most extreme objects in the Universe at the two extremes of the electromagnetic spectrum.
18:25 - 18:40 **Isabelle Grenier,** (CEA Saclay) *Planck*	Planck
18:40 - 18:55 **Kent Wood,** (NRL) *The Pan-STARRS Sky Survey and Fermi*	Fermi and Pan-STARRS 1 (PS1) provide simultaneous overlapping coverage on 75% of the sky (3π steradians, or 100% of the sky north of Dec. = -30 deg.), in gamma-rays and visible-NIR respectively. PS1 uses a 1.8m telescope at Haleakala, Maui, operated by the Institute for Astronomy, University of Hawaii. A 2009 Memorandum of Agreement provides for simultaneous analysis by members of the Fermi Collaboration and PS1 Science Consortium. During 2010-2012 Pan-STARRS achieved sustained performance, accumulating ~500 images per night at 1.4 Gpixel/image, each image covering 8 square degrees. Observations occur in an optimized sequence using five filters, g, r, i, z, and y, collectively covering wavelengths 405 to 1020 nm. Single exposures reach approximately magnitude 22 in any filter and stacked images go deeper but lose time resolution. Images are analyzed and results distributed using a two-stage pipeline. All 3π steradians have been observed and processed through the first pipeline stage. A substantial sky fraction is also now available from the second stage, which facilitates selective distribution. All PS1 sky coverage is effectively simultaneous with Fermi to within hours at worst. User feedback has steadily improved photometry, astrometry, and rejection of false positive detections, leading to reprocessing to incorporate improvements. Sky coverage, timescale coverage, filter sequencing, quality of photometry and astrometry are illustrated along with characterization of the overlap and compatibility with Fermi. Blazars and AGN are the largest, but not the only, source category benefitting from access in both instruments. Future observing plans and opportunities for galactic and extragalactic studies are described.
18:55 - 19:10 **Fiona Harrison,** (Caltech) *NuSTAR and Fermi*	NuSTAR and Fermi
19:10 - 19:25 **Brenda Dingus,** (Los Alamos National Lab) *HAWC and Fermi*	The High Altitude Water Cherenkov (HAWC) observatory extends the wide field of view, continuously operating characteristics of the Fermi GeV observatory to TeV energies. HAWC observations will begin in 2013 with 1/3 of the detector and the full detector will be operational in 2014. HAWC's field of view of ~2 sr and angular resolution of ~0.5 degrees are similar to Fermi's. HAWC's flux sensitivity is comparable to the narrow field of view and low duty cycle, atmospheric Cherenkov telescopes, such as VERITAS and HESS, at energies above a few TeV. The location of HAWC at 19°N latitude allows HAWC to survey -10
19:25 - 19:40 **David Williams,** (UCSC) *Beyond Fermi: Prospects for Very High-Energy Gamma-Ray Observations with CTA*	Fermi has revealed a new understanding of the gamma-ray sky by delivering more than an order of magnitude improvement in sensitivity compared to previous instruments operating in the high-energy (~100 MeV to ~100 GeV) regime. The Cherenkov Telescope Array (CTA) seeks to obtain similar advances in the ~30 GeV to ~100 TeV energy band by likewise achieving an order of magnitude improvement in sensitivity over currently operating instruments (VERITAS, MAGIC, HESS). CTA will shed new light on the high energy extension of the spectra of Fermi sources, building on the success of the Fermi mission and adding to the Fermi legacy. The plans for CTA are presented. The presentation focuses on how CTA will be able to address key science topics such as the indirect detection of dark matter, cosmic ray acceleration, and very high-energy gamma-ray production in blazar jets.
19:40 - 19:55 **Cole Miller,** (University of Maryland) *aLIGO*	aLIGO
19:55 *Discussion*	Discussion

Wednesday October 31

8:30-9:00 **Justin Fink**e, (US Naval Research Laboratory) *Our Evolving Understanding of Blazars in the Fermi Era*	Our Evolving Understanding of Blazars in the Fermi Era
9:00-9:30 **Talvikki Hovatta,** (Caltech) *Blazar Observations in the Fermi Era*	Blazar Observations in the Fermi Era
9:30-10:00 **Jun Kataoka**, (Waseda University) *Non-Blazar AGN and AGN Unification in the Fermi Era*	I will present an overview of Fermi LAT gamma-ray observations of non-blazar AGN. This includes most recent highlights from radio galaxies, extended radio lobes, and radio-quiet/Seyfert galaxies. I will also introduce various multiwavelength efforts for the observations of bright radio galaxies towards AGN unification scheme. Another topic to be discussed will be a close similarity between the giant radio lobe and so-called “Fermi-bubbles” extending over 50 degrees above and below the Galactic center. Insight into the gamma-ray emission mechanism and possible production sites of high energy particles will be discussed as well as future prospects for such studies.
10:30-11:00 **Giacomo Vianello**, (Stanford University) *Observations of GRBs*	Observations of GRBs
11:00-11:30 **Dafne Guetta**, (ORT-Braude, Israel andOAR-INAF, Italy) *Gamma-ray Burst Theory in the Fermi Era*	In this talk I will review some recent Fermi results on high energy emission from Gamma- Ray Bursts (GRBS). I will present the main physical processes responsible for this emission and how Fermi data allowed to put constraints on several GRB emission models. I will show new results on the constraints that can be set on the quantum gravity models using the Fermi data. GRBs can be also sources of high energy cosmic rays, neutrinos and gravitational waves (GW). The neutrino detector IceCube in Antartica has started to collect data and the gravitational waves detectors like VIRGO and LIGO will be expanded in the next coming years. The detection by Fermi of electromagnetic counterparts from GW and neutrino events is fundamental in order to identify the GW and neutrino sources, and also enhances the confidence level of these GW and neutrino detections. I will discuss synergies of Fermi with other current and future measurements that will be carried out by IceCube and the gravitational wave detectors.
11:30-12:00 **Alexander Tchekhovskoy**, (Princeton University) McKinney, J.C., Blandford, R., Narayan, R. *Simulations of Black Hole Accretion and Jets*	Recent progress in computer simulations allows studies of jet formation in a variety of black accretion systems in unprecedented detail. In this talk I will present recent advances in our understanding of accretion-jet connection and discuss the observational implications.

Parallel Sessions with Abstracts

14:00-15:30 Parallel C. i) AGN I — Wednesday October 31

14:00-14:15
Svetlana Jorstad
(IAR, Boston University)

Evidence of a Strong Connection between Gamma-ray Outbursts and Events in the Millimeter-wave Core of Blazars

We report results from our program of monitoring 35 gamma-ray detected blazars (21 quasars, 12 BL Lac objects, and 2 radio galaxies) with the VLBA at 43 GHz (7 mm) from August 2008 to August 2012. We identify superluminal knots in the jets and determine the epochs when the knots pass through the mm-wave core (the ejection time). We construct a gamma-ray light curve for each source using the latest photon and spacecraft data provided by the Fermi LAT and identify sources with gamma-ray flares. Comparison of ejection times with times of gamma-ray flares reveals different relations between gamma-ray events and disturbances in the parsec-scale jet: i) the majority of gamma-ray flares (74.6%) and ejections (79.7%) are simultaneous within the uncertainties; ii) the coincidence rate is even higher for events with gamma-ray flux >10^6 ph/cm^2/s, which are more common in quasars (3C454.3, 3C273, 1510-089, 1222+216, 1633+382, 0836+714, and 1730-130); iii) 20% of superluminal ejections in blazars do not trigger gamma-ray activity; iv) 25% of gamma-ray flares, mostly in BL Lacs, are not associated with jet activity seen at 7 mm; and v) 57% of the light curves show simultaneous quiescent states at both gamma-rays and mm-waves. This result implies that acceleration of electrons to energies exceeding 1 GeV and an intense field of seed photons occurs on parsec scales in the relativistic jets of blazars. This research was supported in part by NASA grants NNX08AV65G, NNX08AV61G, NNX09AT99G, NNX09AU10G, NNX-10AO59G, and NNX11AQ03G.

14:15-14:30
Lars Fuhrmann
(Max-Planck-Institut fuer Radioastronomie Bonn, Germany) et al.

The Radio/Gamma-Ray Connection: Cm To Short-Mm Band Radio And Gamma-Ray Correlated Variability In A Large Sample Of Fermi Bright Blazars

The exact location of the gamma-ray emitting region in blazars is still controversially discussed. Different theoretical models suggest either small (~ 100-1000 Schwarzschild radii) distances from the supermassive black hole near the jet base, or larger distances, at the radio shocks on pc scales. In order to attack this problem we present a detailed study of the relation between cm to mm radio and gamma-ray variability/flares in the light curves of a large sample of Fermi-bright blazars. The long-term cm to short-mm radio data of 56 sources obtained by the F-GAMMA program at 10 frequency bands are combined with Fermi LAT gamma-ray lightcurves covering a total period of 3.7 years. A sophisticated statistical cross-band and stacking analysis is presented together with more direct analysis of lightcurve properties, such as relative timing and onsets of radio/gamma-ray events. Our results reveal for the first time highly significant correlations with time delays strongly decreasing towards the short-mm bands indicating co-spatial emitting regions in the shocks on pc scales. Significant differences between FSRQs and BL Lacs are presented and possible correlations with other source parameters (e.g. blackhole mass) are discussed.

14:30-14:45
Mahito Sasada, (Kyoto University)
Uemura, M., Fukazawa, Y., Itoh, R., Kawabata, K. S., Yoshida, M.

Optical Photometric And Polarimetric Behaviors Of Blazar Outbursts

Active Galactic Nuclei (AGNs) often have relativistic jets. Blazars are believed to be viewed at a small angle to the line-of-sight, and show characteristic behaviors for the relativistic effect. Blazars often show highly polarized and variability, because of synchrotron radiation from high energy electrons. Since the synchrotron radiation is polarized perpendicular to a direction of magnetic field, we obtain information of the magnetic field of the emitting region. We performed multi-band optical and near-infrared monitoring to blazars, and then, detected a lot of large-amplitude brightenings, called after outbursts. Most of outbursts occurred with dramatic polarization changes. During the 2010 outburst of 3C 454.3, there were rapid brightenings together with rises of degrees of polarization. This feature indicates that blazar synchrotron radiation is constructed in two components and the outburst component is higher polarized than baseline one.

14:45-15:00
Emmanouil Angelakis, (Max-Planck-Institut für Radioastronomie)
L. Fuhrmann, N. Marchili, I. Nestoras, V. Pavlidou, C. M. Fromm, M. Perucho, T. P. Krichbaum, J. A. Zensus, H. Ungerechts, A. Sievers, D. Riquelme

F-GAMMA Program: 5 Years Of Cm To Short-Mm Monitoring Of Fermi LATBlazars

The F-GAMMA program is among the most comprehensive efforts to probe the AGN physics via tracing the evolution of the broad-band radio spectra of some 65 selected Fermi blazars. It covers the range between 2.6 and 345 GHz at 12 frequency steps by utilizing the Effelsberg 100-m, Pico Veleta 30-m and the APEX telescopes in a monthly monitoring fashion since January 2007. The spectra coherency is better than 10 days and the achieved precision of the order of less than a few percent. Here we discuss the sample in its initial and revised form and present studies on the basis of the first five years of data (January 2007 - January 2012). Specifically, (a) we present the results of a detailed time series and cross-band analysis applied to the five-year data set and investigate correlations with source physical properties as well as test predictions of shock-in-jet models; (b) We propose a phenomenological classification of the spectral variability patterns which, as we show, can be well reproduced with only modest coverage of the source parameter space, assuming that the variability is due to internal shocks; (c) we discuss bias-free Flux(radio) - Flux(gamma) correlations seen at short-mm bands; (d) we study the radio variability amplitude by means of “intrinsic modulation index” and investigate how it influences the Fermi detectability.

15:00-15:15 **Francesco Massaro**, (Stanford University) R. D'Abrusco, A. Paggi *Unveiling the Nature of the Unidentified Gamma-ray Sources*	One of the main scientific objectives of the recent Fermi mission is unveiling the nature of the unidentified gamma-ray sources (UGSs). Despite the large improvements of Fermi in the gamma-ray source localization with respect to the past gamma-ray missions, about 1/3 of the gamma-ray objects detected still do not have a low energy counterpart associated. Recently, we discovered that blazars, the rarest and the largest known class of gamma-ray sources, can be recognized and separated from other extragalactic sources dominated by thermal emission using the IR colors. I will present how the Wide-Field Infrared Survey Explorer (WISE) infrared data make possible to identify a distinct region of the IR color-color diagrams where the gamma-ray emitting blazars are separated from the other Galactic and extragalactic sources. This IR non-thermal region of the parameter space, so called WISE Gamma-ray Strip (WGS), it is a powerful new diagnostic tool that can be used to extract new blazar candidates, to identify those of uncertain type and also to search for the blazar-like counterparts of unidentified gamma-ray sources. First, I will show the relation between the infrared and gamma-ray emission for a selected sample of blazars associated with Fermi sources, for which WISE archival observations are available. Then, for the first time, I will present a low-energy candidate counterpart for 156 out of 313 UGSs analyzed. Finally, I will show the physical origin of the IR - gamma-ray connection and comparing this new association method with the previous ones.
15:15-15:30 **Matthew Baring**, (Rice University) Markus Boettcher (Ohio University) and Errol J. Summerlin (NASA/GSFC) *Probing the Relativistic Shock Environs of Blazar Jets in the Fermi Era*	Diffusive shock acceleration (DSA) at relativistic shocks is very likely to be an important acceleration mechanism in various astrophysical jet sources, including radio-loud AGN. An important aspect of the Fermi legacy for blazar science is the ability of the LAT to pin down the power-law index of the high energy portion of emission in these sources, and therefore also the index of the underlying non-thermal particle population. This diagnostic potential was not possible prior to Fermi launch, when gamma-ray information was dominated by the highly-absorbed TeV band. This paper highlights how multiwavelength spectra including Fermi data can be used to probe diffusive acceleration in relativistic, oblique, MHD shocks in blazars. A brief summary of recent results of Monte-Carlo simulations of DSA at relativistic shocks is given. The spectral index of the resulting nonthermal particle distributions and the fraction of thermal particles accelerated to non-thermal energies, depend sensitively on the particles' mean free path scale, and also on the shock obliquity. We investigate self-consistently the radiative (synchrotron + Compton) signatures of the resulting thermal + nonthermal particle distributions. Important constraints on the frequency of particle scattering and the level of field turbulence are identified for blazars such as Mrk 501 and the Bl Lac object AO 0235+164. The possible interpretation that turbulence levels decline with remoteness from the shock, and a significant role for non-gyroresonant diffusion, are discussed.

14:00-15:30 Parallel C. ii) Diffuse/CR/Solar — Wednesday October 31

14:00-14:15 **J. Eric Grove**, (Naval Research Laboratory) A. Chekhtman on behalf of the LAT team; M. S. Briggs, V. Connaughton, G. J. Fishman on behalf of the GBM team *A Four-Year Fermi Large Area Telescope Survey of Terrestrial Gamma-ray Flashes*	The Fermi LAT regularly detects Terrestrial Gamma-ray Flashes (TGFs) during its nominal astrophysical sky-survey observing program. Because of the LAT's flexible trigger logic, TGF emissions at and above 10 MeV are detected with high sensitivity despite their having arrived from outside the instrument's field of view. Bright TGFs can be imaged with good accuracy for comparison with VLF geolocations. A deep search of the first four years of LAT data reveals more than 200 TGFs with hard gamma-ray emission, of which many were independently detected by Fermi GBM. Here we present a summary of the spectral, temporal, diurnal, and geographic features of this sample of high-energy TGFs.
14:15-14:30 **Jean-Marc Casandjian**, (CEA Saclay) On behalf of the Fermi LAT collaboration *Precise Measure of HI Emissivity in the Solar Neighborhood*	Cosmic-ray electrons and nuclei interact with the Galactic interstellar gas and produce high-energy gamma rays. The production processes are mainly Bremsstrahlung and hadronic interactions. Their emission rate, called emissivity, provide a unique indirect probe of the cosmic-ray flux. We present a precise measure of the HI emissivity in the solar neighborhood performed by Fermi between 60 MeV and 40 GeV and the derived constraints on the interstellar cosmic-ray proton and alpha spectra.

14:30-14:45 **Katsuhiro Hayashi**, (Hiroshima University) Tsunefumi Mizuno and on behalf of the Fermi LAT collaboration *Fermi LAT Study of Cosmic-rays and the Interstellar Medium in Nearby Molecular Clouds*	We report an analysis of the interstellar gamma-ray emission from the Chamaeleon, R CrA, and Cepheus and Polaris flare regions with the Fermi Large Area Telescope (LAT). They are among the nearest molecular cloud complexes, within about 300 pc from the solar system. The gamma-ray emission produced by interactions of cosmic rays and interstellar gas in those molecular clouds is useful to study the CR densities and distributions of interstellar gas close to the solar system. At the interface between the atomic and molecular gas, a considerable amount of "dark gas" is inferred to be associated with cold dust but not traced by HI and CO lines. Thanks to the excellent performance of the LAT, we have obtained unprecedentedly high-quality emissivity spectra of the atomic and molecular gas in these regions in the 250 MeV - 10 GeV range. We carefully examined systematic uncertainties due to the optical depth correction of the atomic gas and backgrounds such as the inverse Compton scattering and isotropic components. The obtained emissivities indicate a variation of the CR density of about 20 % among three regions, even if we take into account the combined statistical and systematic uncertainties. The molecular mass calibration ratio, Xco, is found to be 0.6 –1.0 (x 10^{20} H_2-molecule cm^{-2} (K km s^{-1})$^{-1}$ in the three regions, suggesting a variation of Xco in the vicinity of the solar system. From the obtained values of Xco, we calculated masses of molecular gas traced by Wco in these molecular clouds. In addition, similar amounts of dark gas at the interface between the atomic and molecular gas are inferred.
14:45-15:00 **Fiorenza Donato**, (Physics Department, Turin University, Italy) Francesca Calore, Mattia Di Mauro *Gamma-ray Emission from Radio Galaxies*	We present a new calculation of the diffuse gamma-ray emission from the Fanaroff-Riley I and II radio galaxies, exploiting a possible correlation between gamma and radio emission. The latter is studied for a set of radio galaxies resolved by the Fermi LAT telescope and is tested against gamma-ray upper limits for a number of radio loud AGN. We estimate the gamma-ray flux for the unresolved radio galaxy population which can contribute to the isotropic diffuse gamma-ray background.
15:00-15:15 **Jennifer Siegal-Gaskins**, (Caltech) Brandon Hensley, Vasiliki Pavlidou *A Model-Independent Method to Identify and Constrain Source Populations Using Anisotropy Analysis*	The contribution of unresolved source populations to diffuse emission at all wavelengths can induce anisotropies on small angular scales. Several recent studies have focused on the potential for anisotropy analysis of the large-scale isotropic gamma-ray background (IGRB) to identify the origin of this emission and to constrain the properties of known and proposed gamma-ray source classes. I will present a novel approach to identifying the source classes contributing to diffuse emission by combining the energy dependence of the total anisotropy and the total intensity, and demonstrate how this technique can be used in a model-independent way to extract the energy spectra of the contributing populations directly from the data, without making a priori assumptions about the spectra of any contributors. While this approach is applicable for any diffuse background at any wavelength, I will focus on its potential for understanding the IGRB. I will also discuss the implications for various source populations of the recent Fermi LAT measurement of the angular power spectrum of the IGRB.
15:15-15:30 **Nicola Giglietto**, (INFN-Bari) Mazziotta *Lunar Gamma-ray Emission Observed by Fermi LAT as a Probe to Study the Solar Cycle*	The gamma-ray emission from the Moon comes from the secondary interactions of cosmic-rays with the lunar surface and the flux intensity is therefore linked to the flux of cosmic rays on the Moon. Since the flux of cosmic rays is affected by the solar modulation, we expect to observe higher fluxes at the solar minimum and lower flux levels going toward the solar minimum. Moreover the knowledge of the lunar emission is important for studies of any weak and transient sources near the ecliptic, and therefore the lunar flux has to be studied carefully. In this work the Fermi LAT observation of the observed lunar emission during the first 4 years are presented.

16:00-17:30 Parallel D. i) AGN II — Wednesday October 31

16:00-16:15 **Benoit Lott**, (CENBG) S. Larsson on behalf of the Fermi LAT Collaboration *Revisiting Variability of Bright Active Galactic Nuclei in the High-Energy Gamma-Ray Band*	We investigate the variability properties of 84 of the brightest blazars detected by the Fermi LAT using 44 months of Fermi LAT gamma-ray data. We generated light curves with the recently-developed adaptive-binning method (ABM) using constant flux relative uncertainties as well as with fixed binnings. The ABM light curves are free of upper limits and enable more accurate assesments of different parameters, e.g, the duty cycle, the flares' rise and fall times and the correlation between flux and spectral hardness.

16:15-16:30 **Giovanni Fossati**, (Rice University) Eileen T. Meyer (STScI), Markos Georganopoulos (UMBC) *The Broken Sequence and the Torn Blazar Envelope*	We present the latest developments of our work on the "blazar envelope" and the emerging hypothesis of the existence of a dichotomy of jet properties, with "strong" and "weak" jets, associated with jet (velocity) structure. The jet dichotomy does not match well with jet power being the sole fundamental parameter: differences in accretion mode (manifested observationally in the disc radiative efficiency) and BH mass play an important role. However, accretion power may only set an upper limit on the jet power. Observations are consistent with a change in accretion mode at some critical value (in Eddington units) of around 0.01, linked to a transition in jet SED properties. A spectral sequence may exist in a "broken" form, and depending on the mass of the BH, jet of similar kinetic power may be "strong" or "weak". The highest power "strong" jets exhibit collective evidence that their gamma-ray component external Compton (EC), i.e. they become dissipative within the first parsec. Lower power jets, though still very powerful and largely FSRQs (i.e. with luminous sources of soft thermal radiation around the jet), don't exhibit a clear signature and may be consistent with SSC origin of their gamma-ray emission, hence larger dissipation distances.
16:30-16:45 **Paola Grandi**, (INAF-IASF) Torresi E., Fermi LAT Collaboration, De Rosa A. *Constraining the Size and the Flare Activity of the Gamma-ray Regions in Misaligned AGN*	Gamma-ray time variability studies are powerful tools for constraining the dimensions of the regions where high-energy emission occurs. This analysis is particularly useful for AGN with jets not directly pointing towards the observer (Misaligned AGN; MAGN). Indeed, for GeV-emitting AGN, the origin of the high-energy photons is still unclear. They could be produced in the compact core, in knots along the jet, or in the extended radio lobes. In the nearby radio galaxy Centaurus A, the gamma-ray flux in the lobes and core are roughly the same, and in the Fanaroff-Riley (FR) type I radio galaxy M 87, multiwavelength campaigns seem to indicate multiple emitting regions in the jet. Finally, a recent variability study of the FR type II radio galaxy 3C 111 has excluded a significant GeV contribution from radio lobes and/or hotspots and localized the dissipation region, at least during a flare, to a distance of < 0.3 pc from the black hole. In order to further explore this issue, we began a systematic gamma-ray variability study of all the MAGN listed in the published LAT catalogs with the addition of 3C 120 and Pictor A. Four years of LAT data are analyzed using different time bin intervals in order to constrain a minimal time scale of variability for each source. On the basis of simple causality arguments, an estimation of the maximal dimension of the high-energy emitting regions is provided. Finally, we attempt to quantify the fraction of time that MAGN spend in the flare state in order to determine if the paucity of MAGN emitting in the GeV range could be due to variability effects.
16:45-17:00 **Giulia Migliori**, (SAO) A. Siemiginowska (SAO), B.C. Kelly (UCSB) *Gamma-ray Emission in Young Radio Sources: Fermi LAT Observations*	Theory has shown that in young and compact extragalactic radio sources lobes and jets can produce gamma-ray flux, via Compton scattering of different seed photons, to levels potentially detectable by Fermi LAT. Being contributed only by the non-thermal emission, the gamma-ray band is important to ascertain the origin of the whole high-energy (X- to gamma-ray) output in this class of sources. This is a crucial aspect for our understanding of the radio sources' evolution and the feedback mechanism with the host galaxy during the initial stage of evolution. We report the results of our investigation on the gamma-ray emission of a sample of young quasars and radio galaxies, already observed in the X-rays, using >3 yrs of Fermi LAT data. LAT data are used to test theoretical models predicting beamed and unbeamed high energy emission in such objects.
17:00-17:15 **Filippo D'Ammando**, (Dip. Physics Univ. Perugia and INFN) G. Tosti, M. Orienti, J. Finke on behalf of the Fermi LAT Collaboration *Four Years of Fermi LAT Observations of Narrow-Line Seyfert 1 Galaxies*	Before the launch of the Fermi satellite only two classes of AGN were known to generate relativistic jets and thus emit up to the gamma-ray energy range: blazars and radio galaxies, both hosted in giant elliptical galaxies. The first two years of observations by the Large Area Telescope (LAT) on board Fermi confirmed that these two are the most numerous classes of identified sources in the extragalactic gamma-ray sky, but the discovery of variable gamma-ray emission from 5 radio-loud Narrow-Line Seyfert 1 galaxies (NLS1s) revealed the presence of a possible emerging third class of AGN with relativistic jets. Considering also that NLS1s are typically hosted in spiral galaxy, this finding poses intriguing questions about the nature of these objects, the onset of production of relativistic jets, and the cosmological evolution of radio-loud AGN. Here, we report on a first systematical investigation of the properties of a large sample of radio-loud NLS1 at MeV-GeV photon energies, utilizing the four-year accumulation of Fermi LAT data. In addition we discuss the radio-to-gamma-rays properties of the gamma-ray emitting Narrow-Line Seyfert 1 in the context of the blazar scenario, in particular of the two flaring NLS1s PMN J0948+0022 and SBS 0846+513.
17:15-17:30 **Raffaele D'Abrusco**, (Harvard-Smithsonian CfA) F. Massaro, A. Paggi *A Method for the Extraction Mid-infrared Gamma-ray Emitting Candidate Blazars*	The mid-infrared properties of gamma-ray emitting blazars have emerged as a distinctive features of such sources that rival with other more classical features of blazars. The gamma-ray emitting blazars occupy a narrow and peculiar region of the WISE color space, the so called WISE blazars locus. Such unique pattern has been shown to be effective as a tool to associate unidentified Fermi sources to candidate blazars extracted from the WISE photometric catalog. In this talk I will discuss another use of the blazars locus, namely the extraction of a list of candidate blazars from the WISE all-sky photometric catalog. I will discuss the new modelization of the locus that employs three different regions, respectively dominated by BL Lacs, FSRQs and mixed, in the Principal Component space generated by the WISE mid-infrared colors space of a sample of confirmed gamma-ray emitting blazars. This new extraction method is also capable of taking into account the local contamination to the WISE locus from non-blazars in the WISE catalog, and can be fine-tuned to achieve distinct efficiency/completeness trade-offs. FInally, I will discuss the application of this method to the All-Sky WISE catalog and will give some details about the statistical properties of the catalog of candidate blazars extracted.

16:00-16:15 **Brian Morsony**, (University of Wisconsin-Madison) Davide Lazzati, Mitchell C. Begelman *Photospheric Emission from Long-Duration Gamma-ray Bursts*	We present new simulations of GRB photospheric emission that are able to quantitatively reproduce important observational correlations. Two key observational constraints on GRB emission are that the more energetic events are characterized by photons of higher frequency (Amati et al. 2002) and they are produced by outflows with higher velocity (Liang et al. 2012, Ghirlanda et al. 2012). Earlier work indicated that photospheric emission can qualitatively account for the former constraint but is unable to quantitatively reproduce the photon frequency of a burst of given energy. Simulated bursts were found to be softer than their observed counterparts. Here we report simulations that produce both the observed relations. The key physics not previously captured is that the photospheric spectrum is formed at the surface of last energy exchange between the radiation and the electrons rather than at the surface of last scattering (Giannios 2011). We find that simulated GRBs are relatively insensitive to the details of the progenitor star and injected jet. However, their characteristics are strongly dependent on the angle between the jet axis and the line of sight to the observer. This implies that the observed correlations are mainly due to the polar stratification of the outflow induced by its interaction with the progenitor star. We also find that the radiative efficiency of simulated bursts is correlated to the burst energetics, a prediction that can potentially be tested against observations.
16:15-16:30 **Veronique Pelassa**, (University of Alabama in Huntsville) M. S. Briggs, V. Connaughton (on behalf of the Fermi GBM and LAT teams) *On the Origin of the High-Energy Emission from Short Gamma-ray Bursts Observed by the Fermi GBM*	We present a study of the properties of short Gamma-Ray Bursts (GRB) as observed by the Gamma-Ray Burst Monitor (GBM) on-board the Fermi space telescope. The GBM observes about 45 short GRB per year, five of which have been detected above 100MeV by the Large Area Telescope (LAT) over the first three years of Fermi operations. In this work, we aim to understand if the high-energy emission observed in short bursts is related to a hard spectral component in the prompt phase and/or to a long-lasting emission, two properties of bright long and short GRB observed by Fermi (e.g. 090510A, 090926A, 090902B). We consider short GRB from the first two GBM catalogs, covering four years of observations, and compare GRBs with LAT detections to those with non-detections. We will also study the link between this high-energy emission and the spectral characteristics measured in the energy range covered by the GBM.
16:30-16:45 **Elisabetta Bissaldi**, (UIBK) *Duration-Energy Analysis of Bright High-Energy GRBs Detected with Fermi GBM and LAT*	Duration-Energy Analysis of Bright High-Energy GRBs Detected with Fermi GBM and LAT
16:45-17:00 **Ken-Ichi Nishikawa**, (UAH/CSPAR) K.-I. Nishikawa, B. Zhang, M. Medvedev, P. Hardee, E. J. Choi, K. W. Min, J. Niemiec, Y. Mizuno, A. Nordlund, J. T. Frederiksen, H. Sol, M. Pohl, D. H. Hartmann, I. Dutan, & G. J. Fishman *Radiation from Accelerated Particles in Relativistic Jets with Shocks, Shear-low, and Reconnection*	We investigated particle acceleration and shock structure associated with an unmagnetized relativistic jet propagating into an unmagnetized plasma. Strong magnetic fields generated in the trailing shock contribute to the electron's transverse deflection and acceleration. We have calculated, self-consistently, the radiation from electrons accelerated in these turbulent magnetic fields. We found that the synthetic spectra depend on the bulk Lorentz factor of the jet, its temperature and strength of the generated magnetic fields. We also investigate synthetic spectra from accelerated electrons in strong magnetic fields generated by kinetic shear (Kelvin-Helmholtz) instabilities. The calculated properties of the emerging radiation aid our understanding of the complex time evolution and/or spectral structure in gamma-ray bursts, relativistic jets in general, and supernova remnants.
17:00-17:15 **Daniel Kocevski**, (Stanford/SLAC) *Fermi LAT Stacking Analysis of Swift Localized GRBs*	Fermi LAT Stacking Analysis of Swift Localized GRBs
17:15-17:30 **Gerard Fitzpatrick**, (University College Dublin) S. McBreen, V. Connaughton on behalf of the Fermi GBM Team *A Search for Extended Emission in Fermi GBM GRBs*	Gamma-Ray Bursts (GRBs) are characterized at high energies in their prompt emission by impulsive peaks with sharp rises, often highly structured, and easily distinguishable against instrumental backgrounds. The longer-lived afterglow radiation seen at lower energies is much smoother and would be difficult to detect in a background-limited instrument such as the Gamma-ray Burst Monitor (GBM) onboard Fermi. Observations above 100 MeV of this type of long-lived emission from bright GBM-detected GRBs by the Fermi Large Area Telescope (LAT) suggest the possibility of extended lower-energy gamma-ray emission. We report the results of a search for such emission in GBM GRBs from the first 4 years of operation.

Thursday November 1

8:30-9:00 **Elizabeth Ferrara**, (GSFC/ UMCP/CRESS) on behalf of the Fermi LAT Collaboration *The Fermi Census: Innovation, Challenge, And Discovery In The Fermi All-Sky Survey*	The Fermi mission has provided the deepest and most comprehensive view of the gamma-ray sky to date. This report summarizes the ongoing efforts to catalog and associate these sources. We also discuss unexpected detections and the resulting increase in gamma-ray source classes.
9:00-9:15 **David Paneque**, (Max Planck Institute for Physics) Pascal Fortin, Jean Ballet, Toby Burnett, Juergen Knoelseder, on behalf of the Fermi LAT *The First Fermi LAT Catalog of Sources Above 10 GeV*	We searched for gamma-ray sources at energies above 10 GeV using data from the Large Area Telescope (LAT) accumulated during the first 3 years of the Fermi Gamma-ray Space Telescope mission. We detected 516 sources with a Test Statistic (TS) larger than 25, measured their spectra, quantified their variability, and studied their associations with cataloged sources at other wavelengths. We found that 453 (88%) objects could be associated with known sources, out of which 393 (76%) are AGNs. This list complements the Second Fermi LAT catalog, which was based on 2 years of data extending down to 100 MeV and so included many sources with softer spectra. In the conference we will also report on the population implications and highlight the subset of sources that are good candidates for detection at energies above 50-100 GeV with currently operating and future Cherenkov telescope facilities.
9:15-9:30 **Alice Allafort**, (SLAC / Stanford University) Rolf Buehler, Marco Ajello on behalf of the Fermi Large Area Telescope Collaboration *A Catalog Of Flaring Gamma-Ray Sources*	The Fermi All-sky Variability Analysis (FAVA) is a procedure developed to systematically study the variability of the gamma-ray sky measured by the Large Area Telescope (LAT) on board the Fermi Satellite. FAVA compares the number of observed gamma rays in a weekly time interval at any point in the sky to the number of gamma rays expected from the average emission detected in the entire period of LAT observations. The main strength of this approach is that it is not sensitive to the modeling of the Galactic diffuse emission, which is the largest source of systematic uncertainty for the standard LAT analysis. We applied the analysis to the first 47 months of LAT data and derived a catalog of flaring gamma-ray sources. The catalog has a total of 218 sources, out of which 27 are located at Galactic latitudes smaller than 10°.
9:30-9:45 **Andreas von Kienlin**, (Max Planck Institute for Extraterrestrial Physics) David Gruber, Adam Goldstein, Chip Meegan and Bill Paciesas on behalf of the Fermi GBM team *The Fermi GBM Gamma-Ray Burst and Spectral Catalogs: Years Three & Four*	The Fermi Gamma-ray Burst Monitor (GBM) has triggered on 953 cosmic gamma-ray bursts in the first four years since trigger enabling on July 12, 2008. The year three and four gamma-ray burst and spectral catalogs are the continuation of the first GBM GRB catalogs (Paciesas et al. 2012, Goldstein et al. 2012). They will summarize the basic characteristics of the triggered GRBs, like sky location, duration, peak flux, fluences and spectral properties. The statistical analyses of these quantities of the entire four year GRB sample will be presented. These catalogs will be an official product of the Fermi GBM science team, and the data files containing the complete results will be available from the High-Energy Astrophysics Science Archive Research Center (HEASARC).
9:45-10:00 **Michael Shaw**, (Stanford) Romani, Roger W.; Cotter, Garret; Michelson, Peter F.; Readhead, Anthony C. S.; Richards, Joseph L.; Max-Moerbeck, Walter; King, Oliver G.; Healey, Stephen E.; Potter, William J. *The Largest Ever Optical Spectroscopic Survey of Blazars*	We report on optical spectroscopy of 459 Fermi blazars—164 Flat Spectrum Radio Quasars (FSRQs) and 295 BL Lacertae Objects (BL Lacs) drawn from the First and Second Fermi LAT AGN Catalogs. In this largest ever optical spectroscopic study of blazars, we show that Fermi FSRQs have smaller virial estimates of black hole mass than the optical quasar sample. This appears to be largely due to a preferred (axial) view of the gamma-ray FSRQ and non-isotropic (H/R ~0.4) distribution of broad-line velocities. Even after correction for this bias, the Fermi FSRQs show higher mean Eddington ratios than the optical quasar population. We further report on the non-thermal dominance of the optical spectrum in both FSRQs and BL Lacs, the degree depending on the gamma-ray hardness. We detect (or constrain the amplitude of) host galaxies for the BL Lacs. We find systematically fainter galaxy hosts for BL Lacs than previous studies, suggesting that this gamma-ray selected sample probes a less luminous population than optically selected samples. These data give redshifts for many of the BL Lacs and significant redshift constraints for the remainder of the population. These extend to substantially higher z than the previously measured subset of this sample. Finally, we discuss the black hole masses of Fermi blazars, and comment on the use of this sample for studies of BL Lac evolution and the extragalactic background light.
10:30-11:00 **Keith Bechtol,** (Stanford/ SLAC / KIPAC) and the Fermi LAT Collaboration *Non-thermal Emission of Star-forming Galaxies--Status and Outlook from keV to TeV Energies*	Star-forming galaxies are an emerging extragalactic gamma-ray source class powered by cosmic-ray interactions in the interstellar medium. Recent observational results and outlook for further studies of non-thermal emission at keV to TeV energies will be presented.

11:00-11:30 **Douglas Finkbeiner,** (Harvard) *Lobes, Jets and Cocoons in the Milky Way*	Lobes, Jets and Cocoons in the Milky Way
11:30-11:45 **Charles Dermer**, (Naval Research Laboratory) A. Strong, T. Kamae, E.Orlando, F.W. Stecker, L. Tibaldo *Interstellar Cosmic-Ray Spectrum From Gamma Rays And Synchrotron*	Gamma-ray emission from interstellar gas can probe Galactic proton and helium spectra down to 400 MeV, while solar modulation restricts the use of direct cosmic-ray measurements to energies above 10 GeV. We use the latest gas emissivity measurements by the Fermi LAT to determine the flux of the local interstellar cosmic-ray spectrum. Particular attention is paid to uncertainties in our knowledge of the hadronic gamma-ray production processes. A further complication is the flux of bremsstrahlung emitted by primary cosmic-ray electrons and lepton secondaries, which is constrained by synchrotron emission at low energies and direct measurements at high energies. We use the results to verify whether the momentum spectrum is a power-law over the energy range accessible by gamma-ray experiments, and whether there is evidence from the gamma-ray spectrum above 20 GeV for the hardening of the proton and helium spectra above 200 GeV reported by PAMELA. Implications for the physics of Galactic cosmic-ray production and propagation are discussed.
11:45-12:00 **Matt Kistler**, (Lawrence Berkeley National Laboratory) *Revealing Aspects of Cosmic-ray Electrons and Positrons*	Using simulations of cosmic-ray propagation in the vicinity of Earth, we find that high-energy electrons and positrons should display unique features in their angular and energy distribution. Finding these would elucidate their origins and thus the positron excess and electron spectrum measured by Fermi.
14:00-14:30 **Markus Ackermann**, (DESY) *Fermi Lat Results On The Intensity And Origin Of The Diffuse Extragalactic Gamma-Ray Background*	The data collected by the Fermi Large Area Telescope (LAT) for more than four years enable a huge step forward in measuring and understanding the origins of the extragalactic diffuse gamma-ray background (EGB). The EGB originates from the superposition of different populations of unresolved sources with possible contributions from genuinely diffuse and exotic processes. In most parts of the sky it is sub-dominant to the Galactic diffuse emission, which represents a foreground to be subtracted to allow a measurement of the EGB intensity. Due to the long exposure, an improved event selection, better understanding of the Galactic diffuse foregrounds and the charged particle backgrounds, we can now extend the measurement of the spectrum of the EGB to the energy range between 200 MeV and several hundred GeV. Furthermore, population studies based on resolved LAT sources allow to constrain the contribution of individual classes of unresolved sources to the EGB.
14:30-14:45 **Alberto Dominguez**, (University of California, Riverside) Justin Finke, Joel Primack on behalf of the Fermi LAT collaboration, Francisco Prada, Francisco Kitaura, Brian Siana *The Extragalactic Background Light And The Detection Of The Cosmic Gamma-Ray Horizon*	The first statistically significant detection of the cosmic gamma-ray horizon (CGRH) that is independent of any extragalactic background light (EBL) model is presented in this talk. The CGRH is a fundamental quantity in cosmology. It gives an estimate of the opacity of the Universe to very-high energy (VHE) gamma-ray photons due to photon-photon pair production with the EBL. The only estimations of the CGRH to date are predictions from EBL models and lower limits from gamma-ray observations of cosmological blazars and gamma-ray bursts. Here, we present synchrotron/synchrotron self-Compton models (SSC) of the spectral energy distribution of 15 blazars based on (almost) simultaneous observations from radio up to the highest energy gamma-rays taken with the Fermi satellite. These synchrotron/SSC models predict the unattenuated VHE fluxes, which are compared with the observations by imaging atmospheric Cherenkov telescopes. This comparison provides an estimation of the optical depth of the EBL, which allows a derivation of the CGRH through a Monte Carlo analysis that is EBL-model independent. We find that the observed CGRH is compatible with the current knowledge of the EBL. We conclude showing that the detection of the CGRH allows us to estimate the expansion rate of the Universe from gamma-ray attenuation.
14:45-15:00 **Marco Ajello**, (SLAC, KIPAC) A. Reimer, R. Buehler on behalf of the Fermi LAT collaboration *The Imprint of the Extragalactic Background Light in the Gamma-ray Spectra of Blazars*	The light emitted by stars throughout the history of the Universe is encoded in the intensity of the extragalactic background light (EBL). Knowledge of the EBL is important for understanding the nature of star formation and galaxy evolution. Direct measurements of the EBL are very difficult due to the intense zodiacal light and the Galactic foreground emission. High-energy gamma rays may interact with photons of the EBL and generate positron-electron pairs. This introduces an attenuation feature in the spectra of distant gamma-ray sources that has been used in the past to set upper limits on the opacity of the Universe and the energy density of the EBL. In this talk, we will report the first detection of an absorption feature seen in the combined spectra of a sample of gamma-ray blazars detected by Fermi out to a redshift of z ~1.6. This feature is caused by attenuation of gamma rays by the EBL at optical to UV frequencies, and points to a minimal level of EBL, consistent with the observed star formation rate and with low-opacity EBL models. We will present the Fermi observations and discuss the implications for the generation of a diffuse UV background at high redshifts. The prospects for a refined measurement of the EBL extending to redshifts higher than z ~1.6 will also be discussed.

15:00-15:15 **Yoshiuky Inoue,** (SLAC, KIPAC) Susumu Inoue, Masakazu A. R. Kobayashi, Ryu Makiya, Yu Niino, Tomonori Totani *Extragalactic Background Light from Hierarchical Galaxy Formation: Gamma-ray Attenuation up to the Epoch of Cosmic Reionization and the First Stars*	We present an extragalactic background light (EBL) model based on a hierarchical galaxy formation model and make predictions for the gamma-ray attenuation up to z = 10. For the EBL model. We employ a semi-analytical galaxy formation model incorporating Population III stars. Although many aspects of EBL have been previously studied, a formulation together with Population III stars has been lacking. Our model successfully reproduces various observations of cosmic star and galaxy formation history and is consistent with cosmic reionization data including the WMAP Thomson scattering optical depth constraints as well. Our model predicts the relatively transparent Universe to gamma-rays comparing to previous studies. We also find that the gamma-ray opacity of the Universe at z > 4 for gamma-ray photons below 60 GeV is still transparent. Future high-z gamma-ray observations by Fermi and CTA will provide a new window for understanding the cosmic early star formation history and cosmic reionization epoch.
15:15-15:30 **Ievgen Vovk**, (ISDC, University of Geneva) *Review Of The Present State Of The Observational Constraints On The Extragalactic Magnetic Field*	The recent evidences for the presence of the Extragalactic magnetic fields (EGMF) from the gamma-ray observations of distant blazars have started an ongoing debate about the role the electromagnetic cascades play in the extragalactic space. With the lower bound on the strength of the EGMF at the level of $10^{-17)}$G, these fields could have served as seeds for the magnetic fields now present in galaxies and their clusters. However, the origin of the EGMF is largely uncertain. Here I review the current state of the observational constraints on the EGMF, as well as different theoretical scenarios, in which they could have formed, and give some prospects for the future space and ground-based gamma-ray instruments.
15:30-15:45 **Rodrigo Nemmen**, (NASA/GSFC) *Unifying Black Hole Jets Across the Mass Scale*	AGNs and GRBs produce powerful relativistic jets and their central engines share the same basic astrophysical ingredients, despite the vastly different mass scales. An outstanding question is how the jet physics scales from GRBs up to AGNs. Using Fermi and Swift observations, we find evidence that the jets produced by blazars and long-duration GRBs follow the same correlation between the intrinsic gamma-ray luminosity and kinetic power. This result suggests that jet production and energy dissipation mechanisms are remarkably similar over 10 orders of magnitude in jet power, establishing a physical analogy between AGN and GRBs. We will discuss the implications of these results in terms of the properties of the central engines of AGNs and GRBs such as the radiative efficiency, bulk Lorentz factor and jet opening angles.
16:00-17:30 Poster session	*Poster Viewing: AGN, Dark Matter and New Physics, GRB, Other Extragalactic*

Friday November 2

8:30-9:00 **Lars Bergstrom,** (University of Stockholm) *Dark Matter and New Physics*	Dark Matter and New Physics
9:00-9:15 **Alex Drlica-Wagner**, (SLAC-KIPAC-Stanford University) Maja Llena Garde, Elliott Bloom, Johann Cohen-Tanugi, and Jan Conrad on behalf of the Fermi LAT Collaboration *Searching for Dwarf Spheroidal Galaxies with the Fermi LAT*	The dwarf spheroidal satellite galaxies of the Milky Way are the most dark-matter-dominated objects known. Their proximity, high dark matter content, and lack of astrophysical backgrounds make them one of the most promising targets for the indirect detection of dark matter via gamma-rays. Indeed, two-year LAT observations of dwarf spheroidal galaxies were able to place tight constraints on the velocity-averaged dark matter annihilation cross section. Here we extend the combined likelihood analysis treatment of local dwarf galaxies to four years of LAT data. This extended analysis includes improved treatments of the LAT instrument and the dark matter distributions of the dwarf galaxies.
9:15-9:30 **Gabrijela Zaharijas**, (ICTP, Italy; INFN, TRieste) Jan Conrad, Alessandro Cuoco, Zhaoyu Yang (for the Fermi LAT collaboration) *Constraints On Dark Matter Annihilation And Decay In The Milky Way Halo*	Indirect DM searches through gamma rays produced in DM annihilation/decay in the Milky Way halo are promising means to test the WIMP paradigm due to the high DM density in the inner Galaxy and proximity of the target. Propagation of Galactic cosmic rays also produces diffuse gamma rays which represent a major foreground for these searches. In this talk we report results of an analysis in which we test the Fermi LAT diffuse data for a contribution from a DM annihilation/decay signal by marginalizing over several parameters that determine the contribution from cosmic-ray-induced diffuse gamma-ray emission. We present competitive constraints on the DM annihilation cross section and decay lifetime for several DM channels and discuss an improved treatment of the uncertainties due to the DM density profile.

9:30 - 9:45 **Christoph Weniger,** (Grappa Institute, Amsterdam) *A Tentative Gamma-ray Line from Dark Matter Annihilation at the Fermi Large Area Telescope*	Using 43 months of Fermi LAT data, we find close to the galactic center a line-like excess of 130 GeV photons with 4.6 (3.2) σ significance before (after) trial correction. The observations are not inconsistent with dark matter annihilation into photon pairs. We will discuss details of the statistical analysis, caveats and prospects.
9:45-10:00 **Andrea Albert**, (The Ohio State University) The Fermi LAT Collaboration, Andrea Albert, Brian Winer, Richard Hughes, Elliott Bloom *Search for Gamma-ray Spectral Lines in the Milky Way Diffuse with the Fermi Large Area Telescope*	There is overwhelming evidence that non-baryonic dark matter constitutes 23% of the energy density of the universe. Weakly Interacting Massive Particles are promising dark matter candidates that may produce monochromatic gamma rays via annihilation or decay. Such interactions would give a narrow spectral line in the Galactic diffuse gamma-ray energy spectrum. Our analysis searches for spectral lines from 5 GeV to 500 GeV using 4 years of Fermi LAT data. For the detector response to a signal, we use a new two-dimensional probability distribution function that incorporates the quality of the gamma-ray energy measurement. In addition, given the many uncertainties associated with the galactic dark matter density distribution, we search in several different regions of interest optimized for various dark matter density profiles. Our results include 95% CL limits on the presence of gamma-ray lines as well as studies of systematic uncertainties and an evaluation of the robustness of the analysis method.
10:30 - 10:45 **Tim Linden**, (UCSC) Dan Hooper, Elizabeth Lovegrove, Stefano Profumo, Farhad Yusef-Zadeh *Understanding the Gamma-Ray Source at the Galactic Center: 3 Convincing Stories*	Recent data taken at TeV energies (by Atmospheric Cherenkov Telescopes) and at GeV energies (by the Fermi LAT) have opened a new window into studies of the Galactic center, and studies over the past several years have already discovered several new phenomena such as the Fermi bubbles and an apparent excess in gamma-rays with a typical energy of approximately 1 GeV which is strongly peaked around the galactic center. In this talk, I will discuss several convincing models for the emission from this region, including the annihilation of particle dark matter, a yet-undiscovered population of millisecond pulsars, and finally proton emission from the central black hole. Finally, I will look at the potential for future experiments, such as the Cherenkov Telescope Array (CTA) to distinguish between these models.
10:45 - 11:00 **Vlasios Vasileiou**, (CNRS/IN2P3 & LUPM/Universite Montpellier 2) J. Bolmont, C. Couturier, A. Jacholkowska, F. Longo, F. Piron, F. Stecker. *Constraining Lorentz Invariance Violation with Fermi LAT Observations of GRBs*	Some quantum-gravity theories allow for the violation of Lorentz invariance (LIV), predicting a dependence of a photon's speed on its energy in vacuum. Because of this dependence, two photons of different energy emitted simultaneously from a distant astrophysical source may not arrive the same time at the Earth. The Fermi LAT and GBM collaborations have already placed tight constraints on LIV-induced dispersions using observations of GRBs 090510 and 080916C. In this work, using Fermi LAT observations of four selected bright GRBs and three different analysis techniques, we place stronger and more robust constraints. We will summarize the analysis and any underlying astrophysical assumptions, and present our preliminary results.
11:00 - 11:30 **Seth Digel** , (SLAC) *Summary*	Summary

Poster List

Mon 29 Oct - Tue 30 Oct

Diffuse Emission/ CR (DCR)

Biagi, Simone (University of Bologna and INFN) *Search for a neutrino emission from the Fermi Bubbles with the ANTARES telescope*	7	The first search for neutrinos from the Fermi Bubbles is presented using data collected by the ANTARES telescope. No evidence of a neutrino signal from the Fermi Bubbles region was found; upper limits were calculated for different energy cutoffs.
Dobler, Gregory, (Kavli Instutute for Theoretical Physics) *A Multiwavelength View of the Galactic Haze/Bubbles*	6	Using WMAP (and Planck) data, I will demonstrate explicitly that there is an “edge” in the microwave haze which coincides with the edge in the Fermi Bubbles and discuss the consequences including constraints on the origin of the bubbles as well as the significance of the edges in the gamma-ray data.
Franckowiak Anna, (SLAC, KIPAC) *Studying the Fermi Bubbles via a Template Fitting and a Spectral Components Analysis*	5	We use two independent data analysis methods to study the spatial distribution and the energy spectrum of the Fermi bubbles. We check the consistency between the two methods and compare our results with recent works.
Green, David, (UMD/NASA/GSFC) *Heavy Cosmic Rays in the Fermi LAT ACD*	1	Improving charge resolution of the Anti-Coincidence Detector of the Fermi Large Area Telescope for use of heavy cosmic-ray analysis.
Huentmeyer, Petra, (Michigan Technological University) *Diffuse Multi-TeV Gamma-Ray Emission from Large Regions in our Galaxy with the HAWC Experiment*	9	We will review previous diffuse gamma-ray emission results and present estimations of HAWC sensitivities to diffuse Multi-TeV gamma-ray emission.
Kurahashi, Neilson Naoko, (University of Wisconsin, Madison) *IceCube Neutrino Analyses Motivated By Fermi LAT Observations*	8	Diffuse neutrino sources predicted by gamma-ray observations such as the galactic plane and Fermi bubbles are searched in neutrinos to constrain the emission mechanism. Other gamma-ray motivated searches are stacking analyses of different categories of Fermi LAT point sources.
Mazziotta, Mario, (INFN-Bari) - 2 *Study of the cosmic-ray proton spectrum from the lunar gamma-ray emission observed by the Fermi LAT*	2	In the present work we study the cosmic-ray proton spectrum starting from the energy spectra of gamma-rays emitted from the Moon, reconstructed using a sample of data taken by the Fermi LAT instrument.
Mitthumsiri, Warit, (Stanford University/ SLAC *Inferred cosmic-ray spectrum from Fermi LAT gamma-ray observations of the Earth limb*	3	The Earth-limb gamma-ray emission is used as an indirect measurement of the local cosmic-ray proton spectrum.
Orlando, Elena, (HEPL and KIPAC, Stanford University) *Diffuse radio emission from the Galaxy*	4	Implication for cosmic rays and magnetic fields

Instrumentation/Analysis (INS)

Baldini, Luca, (Università di Pisa and INFN-Pisa) *Pass 8: toward the full realization of the Fermi LAT scientific potential*	5.2 *	Overview and prospects for the Fermi LAT Pass 8 event-level analysis.
Bregeon, Johan, Dr., (INFN Pisa) *Fermi LAT data reprocessed with updated calibration constants: Pass7 P202 data Abstract*	5.4 *	The Fermi LAT data have recently reprocessed all available data with updated calibration constants, producing higher quality data (in particular a better PSF at high energy) and reduced systematic uncertainties for high level analysis.
Bruel, Philippe, (Laboratoire Leprince-Ringuet (Ecole Polytechnique - CNRS/IN2P3)) *Extending the Fermi energy range above 1 TeV*	2.1	The on-axis total depth of the calorimeter of Fermi is only 8.6 radiation lengths. Performing a detailed fit of the shower profile allows us to extend the Fermi energy range up to 3 TeV.
Chaplin, Vandiver, (UA Huntsville) *Analytical modeling of pulse-pileup energy distortion in GBM, for spectroscopy of highly intense sources*	3.3	We develop a model to predict the effects of pulse-pileup on measured energy spectra with GBM. We demonstrate how this technique is useful for analysis of high-rate sources such as solar flares, SGRs, TGFs.
Ciprini, Stefano, (NASA/GSFC/UMD) *Spectral-Temporal Online Tools for Fermi LAT Data Analysis at ASDC*	4.3	Highlights and recent updates about the ASDC web-based analysis tools, interactive data archives and source catalogs dedicated to Fermi LAT mission data and the related multifrequency archives are here reported.
Cominsky, Lynn, (Sonoma State University) *Twelve Years of Education and Public Outreach for Fermi*	5.1*	A summary of the Education and Public Outreach program activities for NASA's Fermi Gamma-ray Space Telescope.
Corbet, Robin, (UMBC/NASA GSFC) *Looking for Stars and Finding the Moon: Effects of Lunar Emission on LAT Light Curves*	4.5	Searches for gamma-ray binaries using power spectra of LAT light curves show the effects of lunar contamination on sources near the ecliptic. This can be removed by excluding times when the Moon is close to a source.
Drlica-Wagner, Alex, (SLAC-KIPAC-Stanford University) *Correcting for Pile-up Effects in the LAT Anticoincidence Detector*	2.8	We have developed a technique to utilize information from the ACD fast hardware trigger, rather than from the slower analog electronics, to identify and mitigate ghost effects in the ACD and improve gamma-ray efficiency
Fitzpatrick, Gerard, (University College Dublin) *A tool for background estimation with GBM*	3.1	We have developed a background estimation tool for the Gamma-ray Burst Monitor (GBM) which uses the rates from adjacent days when the satellite has approximately the same geographical coordinates. An overview of the capabilities and features of this tool will be presented.
Jung, Ira, (Erlangen Centre for Astroparticle Physics, Germany) *Deconvolution of VHE gamma-ray images using the Richardson-Lucy algorithm*	4.2	Detailed studies of the Richardson-Lucy deconvolution algorithm to VHE gamma-ray images shows that amgular resolutions well below the angular resolution of the very high-energy gamma-ray experiment can be reached.
Kieda, David, (University of Utah) *VERITAS Upgrade: Sensitivity and Status*	1.4	Description of the scientific capabilities of the upgraded VERITAS gamma-ray observatory, and the joint FERMI-VERITAS GI program.
McEnery, Julie, (NASA/GSFC) *Survey and Pointed Observations with the Fermi Gamma-Ray Space Telescope*	5.3*	We will describe the types of observations that Fermi can make, their relative advantages and disadvantages, and provide guidelines for planning and evaluating non-standard observations.

**** Posters displayed Mon 29 Oct - Thu 1 Nov***

Orr, Matthew, (Iowa State University) *Design of a Topological Array Trigger for the Cherenkov Telescope Array*	1.2	Here we present the design of a topological array trigger for the Cherenkov Telescope Array (CTA), a next generation ground-based very high energy gamma-ray observatory. A topological array trigger is a powerful tool for reducing and stabilizing the high trigger and data rates associated with CTA.
Perkins, Jeremy, (CRESST/UMBC/GSFC) *The TeVCat VHE Observer's Tools*	4.1	This contribution will detail how to use the VHE Observer's Tools and describe the algorithms and data behind the TeVCat interface.
Razzano, Massimiliano, (INFN/University of Pisa) *Simulating the Fermi sky: new results after 4 years in orbit*	2.2	We report on the latest developments of detailed simulations of the sky observed by the LAT, which are very useful to support many activities of Fermi today and in the near future.
Rochester, Leon, (SLAC) *Tests of an improved readout configuration for the Fermi LAT Tracker*	2.7	A modified readout configuration for the Fermi LAT Tracker could yield better data without compromising the existing event-processing pipeline. Tests using simulated and actual data are being performed.
Rodi, James, (Louisiana State University) *All-Sky Imaging With the Fermi Gamma-ray Burst Monitor*	3.2	We present results from all-sky images in the 12-25 keV, 25-50 keV, 50-100 keV, and 100-300 keV bands for ~3 years of data from GBM. We also discuss the spectra for sources seen by both GBM and LAT.
Scargle Jeffrey, (NASA Ames Research Center) *Bayesian Block Time Series Analysis*	4.6	An exact Bayesian Block algorithm for time series data and a number of its extensions are presented.
Sgro', Carmelo, (INFN-Pisa) *Overview of the Calorimeter Reconstruction for the Fermi LAT in Pass 8*	2.3	We present a comprehensive overview of the Pass 8 calorimeter reconstruction, provide a summary of the current performance and discuss the prospects for using the LAT calorimeter as a stand-alone gamma-ray telescope.
Usher, Tracy, (SLAC) *Performance of the track reconstruction for the Fermi LAT in Pass 8*	2.5	We present a brief description of the track reconstruction in Pass 8 and then provide a summary of the current performance in comparison to Pass 7.
Van der Horst, Alexander, (University of Amsterdam) *Fermi in the New Era of Radio Astronomy*	4.4	In the next few years a suite of new facilities will start observing the radio sky with fields of view, sensitivities and bandwidths which have not been available before. Some observatories will explore the low-frequency radio sky down to tens of Megahertz with unprecedented sensitivity and high spatial, spectral and temporal resolution. I will discuss the synergy of these new radio telescopes with Fermi and what we can learn from observing some of the most extreme objects in the Universe at the two extremes of the electromagnetic spectrum.
Vercellone, Stefano, (INAF/IASF Palermo) *The ASTRI project: prototype status and future plans for a dual-mirror Cherenkov mini-array*	1.3	ASTRI is a flagship project of the Italian Ministry of Education, University and Research. Within this framework, INAF is currently developing a wide field of view end-to-end prototype of the CTA small-size telescope.
Wisher, Ian, (University of Wisconsin - Madison) *Enhancing the Low-Energy Sensitivity of the HAWC Observatory to Localized Transient Sources*	1.1	We explore the possibility of enhancing the sensitivity of the HAWC gamma ray observatory to transient phenomena in the sub-TeV range by applying a fast and simple track finder on very low-energy, low-multiplicity events.
Wood, Matthew, (SLAC) 2.4 Adapting the Event-Level Analysis to Pass 8 Reconstruction 2.6 Calibration of the Fermi LAT Point-Spread Function	2.4 2.6	2.4 The event-level analysis is the final stage of the analysis chain in which high-level variables such as energy, direction, and photon class are assigned. We present the performance of a preliminary version of the Pass 8 event-level analysis. 2.6 The characterization of the Fermi LAT point-spread function (PSF) is critical for the accurate analysis of point sources in LAT data. We report on the verification of the LAT PSF and a new methodology for deriving the on-orbit PSF model.

Case, Gary, (La Sierra University) *Monitoring the Recent Cygnus X-1 Activity with GBM*	1.6	GBM has been monitoring Cyg X-1 during its recent activity and we present light curves showing the transitions and spectra of the subsequent hard and soft states.
Collazzi, Andrew, (NASA/ORAU) *A Comprehensive Study of GBM Bursts of SGR J1550-5418*	1.14	Starting in October of 2008 and continuing through April of 2009, the Fermi Gamma-ray Burst Monitor (GBM) observed three periods of activity from SGR J1550-5418. We present a comprehensive review of all temporal and time-integrated spectral analyses of the entire set of GBM bursts from this source.
Dubus, Guillaume, (IPAG CNRS/Université Grenoble I) *What caused the gamma-ray flare of PSR B1259-63?*	1.4	The strong gamma-ray flare from the binary PSR B1259-63 detected by the Fermi LAT a month after periastron passage was unexpected. We propose a solution to the puzzle.
Finger, Mark, (USRA) *Observations of Torque Switching in Accreting Pulsars*	1.12	Torque switching is a behavior seen in accreting pulsars where intervals of steady spin-up alternate with intervals of steady spin-down, with the transitions between these intervals being rapid compared to the their duration. This behavior was first noted in the BATSE/GRO data in the 1990's. Surprisingly it is seen in both Roche-lobe overflow and wind-outflow systems. We present observations from Fermi GBM and other instruments, and discuss some of their implications.
Hill, Adam, (SLAC & The University of Southampton) *1.1 The discovery of gamma-ray emission from Nova Sco 2012* *1.11 The hunt for GeV emission from the binary HESS J0632+057*	1.1 1.11	1.1 In June 2012 the LAT discovered a new gamma-ray transient which is coincident with a new nova, Nova Sco 2012. This is second gamma-ray nova discovered by the Fermi LAT. 1.11 To date only 6 high mass X-ray binaries have been definitively shown to emit at >100 MeV energies. One TeV binary, HESS J0632+057 has yet to be detected at GeV energies my the Fermi LAT.
Holder, Jamie, (University of Delaware) *TeV Binaries Observed with VERITAS*	1.8	We summarize recent observations of TeV binary systems with VERITAS, including LS I +61 303 and HESS J0632+057.
Hui, Chiumun, (Michigan Technological University) *Studying Extended TeV Gamma-Ray Sources with HAWC and Milagro*	2.3	The morphologies and spectral analyses of extended TeV sources using Milagro data will be presented, along with the extended source sensitivity of the HAWC observatory, which is scheduled to come online this Fall with a partial array.
Leyder, Jean-Christophe, (NASA/GSFC & USRA) *Iron-line diagnostics in the extreme colliding-wind binary Eta Carinae*	1.15	High-resolution X-ray spectra of Eta Carinae are discussed, offering insights into the shock physics and mechanisms responsible for particle acceleration -up to the GeV energy range- in this peculiar binary system.
McSwain, M. Virginia, (Lehigh University) - *1.2 New Results on the Variabilty of the Gamma-ray Binary LS I +61 303* *1.3 Multiwavelength Observations of Gamma-ray Binary Candidates*	1.2 1.3	1.2, We present new KPNO Coude Feed spectra and Fermi light curves of the gamma-ray binary LS I +6 303 to study its variability. 1.3 We present results from our multiwavelength study of two gamma-ray binary candidates.
Mori, Masaki, (Ritsumeikan University) *Fermi LAT study of two gamma-ray binaries, HESS J0631+057 and AGL J2241+4454*	1.9	Fermi LAT studies of gamma-ray binaries, HESS J0631+057 and AGL J2241+4454, are reported using archival data.
Oya, Igor, (Humboldt University) *Discovery of the VHE gamma-ray source HESS J1641-463*	2.4	A new TeV source, HESS J1641-463, has been discovered in the Galactic plane by the High Energy Stereoscopic System (H.E.S.S.). HESS J1641-463 has a moderate flux level of 1.7 of the Crab Nebula flux at E > 1 TeV and a rather hard photon index of 1.99 +/- 0.13(stat) +/- 0.20(sys). HESS J1641-463 is positionally coincident with the radio supernova remnant SNR G338.5+0.1, but a clear counterpart could not be identified at lower energies. Different possible VHE production scenarios will be discussed in this contribution.
Razzano, Massimiliano, (INFN/University of Pisa) *Fermi LAT observations of the Gamma Cygni complex*	2.2	We report the latest results on PSR J2021+4026 and the Gamma Cygni SNR, based on 4 years of LAT observations
Sabatini, Sabina, (INAF-IAPS) *Gamma-ray monitoring of Galactic Microquasar*	1.5	Gamma-ray monitoring of Galactic Microquasar carried out by the AGILE satellite will be presented, discussing briefly the case of Cygnus X-3 and concentrating on Cygnus X-1. The gamma-ray activity will be put in context with multi-wavelength behaviour and interpreted in terms of spectral emission models.

Shrader, Chris, (NASA/GSFC) *A Search for Gamma-Ray Emission from Variable or Transient Galactic Radio Sources*	1.7	We report on our ongoing search for gamma-ray emission from galactic radio variable and transients sources.
Sushch, Lurii, (Humboldt University of Berlin) H.E.S.S. Observations of the Binary System PSR B1259-63/LS 2883 around the 2010/2011 Periastron Passage	1.10	New H.E.S.S. observations of the binary system PSR B1259-63/LS 2883 taken from 9th to 16th of January 2011, i.e., 25-32 days after the most recent periastron passage of the system on December 15th 2010 are presented.
Weinstein, Amanda, (Iowa State University) *VERITAS observations of the vicinity of the Cygnus Cocoon and MGRO J1908*	2.1	We report here on observations by the VERITAS Observatory of two regions that show complex emission in the GeV and TeV gamma-ray regime: the vicinity of the cocoon of freshly accelerated cosmic rays reported by Fermi, which lies between potential accelerators in the Cygnus OB2 association and the gamma Cygni SNR, and recent observations of complex TeV emission from MGRO J1908+06.
Zhang, Yuan (Louisiana State University) *Earth Occultation Imaging Applied to BATSE -- Application to a Combined BATSE-GBM Survey of the Hard X-Ray Sky*	1.13	A combined BATSE-GBM hard X-ray catalog is presented based on Earth Occultation Imaging applied to reanalysis of BATSE data.

(PSR) Pulsars

Arka, Ioanna, (IPAG Grenoble) *Gamma rays by synchrotron radiation in pulsar winds*	2.6	We explore the possibility that gamma-ray pulsations can originate in the current sheet of a pulsar's striped wind, close to the light cylinder. The radiation is emitted by the thermal populations in the current sheet through the synchrotron process.
Baring, Matthew, (Rice University) *Magnetospheric Pair Creation Attenuation in the Crab Pulsar*	1.12	This paper demonstrates that two-photon pair creation in Crab pulsar's magnetosphere can potentially explain the spectral shape in the Fermi/VERITAS band.
Craig, Helen, (Stanford University) *Multi-component, Multi-altitude Radio Emission Fitting of Fermi-detected Pulsars*	2.1	We have developed a numerical polarization angle model incorporating multi-component, multi-altitude radio emission, along with interstellar scattering and emission mode jumps. We show viable fits for several Fermi-detected MSP; the resulting geometry constraints help understand the gamma-ray light curve.
DeCesar, Megan, (University of Maryland) *1.3 Discovery of an Eccentric Binary Millisecond Pulsar in the LAT-Detected Globular Cluster NGC 6652* *2.5 Light Curve Modeling and Phase Resolved Spectroscopy of Fermi LAT Pulsars*	1.3 2.5	1.3 We have searched for pulsars with the Green Bank Telescope in two globular clusters that were detected in gamma rays by the Fermi LAT, and discovered one millisecond pulsar in NGC 6652. This pulsar is in a very eccentric orbit, with eccentricity between 0.4-0.9; this is uncommon for millisecond pulsars, and implies that the pulsar underwent a violent stellar interaction and/or a companion exchange after it was spun up by accretion. 2.5 We have performed phase resolved spectroscopy on a selection of bright Fermi LAT pulsars, and have modeled their light curves within the vacuum retarded dipole and force-free fields to estimate their emission geometry. With this information, we constrain the model-dependent magnitude of the local electric field that accelerates particles in the magnetosphere, and find that the force-free field yields more physically realistic electric field strengths than the vacuum field.
den Hartog, Peter, (Stanford University) *The remarkable spectrum of PSR J1513-5908*	1.9	PSR J1513-5908 is a young energetic pulsar which exhibits a hard power-law like spectrum in the hard X-ray band (10-300 keV) with a peak energy (in vFv) at a few MeV. We present the broad-band SED and pulse profiles from keV to GeV energies, exploiting the 30-100 MeV capabilities of the Fermi LAT, and discuss possible emission mechanisms responsible for its remarkable spectrum.
Grégoire, Tristan, (IRAP/Université Toulouse/CNRS) *Constraining the Galactic millisecond pulsar population using Fermi Large Area Telescope*	2.2	We developed a Monte Carlo model to predict the spatial and gamma-ray luminosity distribution of the Galactic millisecond pulsar population and estimate their number in the Milky Way.
Harding, Alice, (NASA/GSFC) *Gamma-Ray Light Curves From Pulsar Magnetospheres with Finite Conductivity*	2.10	We investigate the shapes of pulsar gamma-ray light curves using 3D magnetosphere models with finite conductivity, using both geometric emission models and electric fields of the dissipative solutions.

Johnson, Tyrel, (NRC Fellow at NRL) *Modeling the Pulse Profiles of Millisecond Pulsars in the Second LAT Catalog of Gamma-ray Pulsars*	2.3	We outline techniques for simulating and fitting MSP pulse profiles and present preliminary results using light curves from the second LAT pulsar catalog.
Kalapotharakos, Constantinos, (University of Maryland CP / GSFC NASA) *Dissipative Pulsar Magnetosphere*	2.9	We present the magnetic and electric field structures as well as the currents, charge densities, spin down rates and potential drops along the magnetic field lines of pulsar magnetospheres which do not obey the ideal MHD condition **E** • **B** = 0.
Kataoka, Jun, (WasedaUniversity) *X-ray and Optical Studies of the Candidate Radio-Quiet MSP 1FGL J1311.7-3429*	1.5	We present deep optical and X-ray follow-up observations of the candidate radio-quiet MSP 1FGL J1311.7-3429. Not only large-amplitude quasi-sinusoidal optical modulation with a binary (1.56 hr) period, but flaring X-ray and optical variability has been detected thanks to high quality data.
Kong, Albert, (National Tsing Hua University, Taiwan) *Multi-wavelength observations of radio-quiet gamma-ray millisecond pulsars*	1.6	We will present our new Suzaku and JVLA follow-up observations of the first radio-quiet gamma-ray emitting millisecond pulsar candidate, and initial results of our multi-wavelength campaign for searching radio-quiet gamma-ray MSPs by using the Palomar Transient Factory.
Li, Jason, (Princeton University) *Resistivity and Dissipation in Pulsar Magnetospheres*	2.8	We formulate a resistive force-free scheme for pulsars and produce a continuum of solutions that smoothly bridges the gap between the vacuum and the force-free magnetosphere solutions. We apply our method to model intermittent pulsars and gamma-ray emission from reconnecting current sheets in pulsar magnetospheres.
Majid, Walid, (JPL/Caltech) *A Multi-wavelength Campaign to Study Crab Giant Pulses*	1.10	We report on our correlation study of giant pulse emission from the Crab pulsar at radio frequencies with pulsed emission from the Crab pulsar with Fermi photons.
McCann, Andrew, (Univeristy of Chicago) *VERITAS Observations of the Crab Pulsar*	1.11	The Crab pulsar is the only pulsar known to exhibit pulsed emission above 100 GeV. We present an update on observations of the Crab pulsar above 100 GeV with VERITAS.
Renault-Tinacci, Nicolas, (Laboratoire AIM - Université Paris Diderot/Paris 7, CEA/SAp) *Phase-Resolved Spectroscopy of Millisecond Gamma-ray Pulsars*	2.4	We have used Fermi LAT observations to obtain phase-resolved spectra of the emission from 11 bright millisecond pulsars. Spectral evolution is observed within the pulses and from one pulsar to another with age and geometry.
Sanpa-arsa, Siraprapa, (University of Virginia) *Green Bank Telescope (GBT) Radio Millisecond Pulsars Searches in Fermi unassociated LAT sources*	1.2	In less than 3 years, the Pulsar Search Consortium (PSC) has discovered 44 new radio millisecond pulsars (MSPs) from Large Area Telescope (LAT) unassociated gamma-ray sources. Here we report the properties and timing analysis of the 2 MSPs most recently discovered with the Green Bank Telescope (GBT): PSR J0621+25 and PSR J2042+02.
Saz Parkinson, Pablo, (SCIPP/UCSC) *Enhancing Searches for Gamma-ray Pulsars around the Galactic Center with Fermi LAT*	1.1	We present the latest results on searches for gamma-ray pulsars around the Galactic Center. We also propose a modified observing profile that would enhance the exposure in this region to facilitate further pulsar discoveries.
Schroeder, Joshua, (Columbia University) *Companions to Black Widow Pulsars Discovered with the Fermi LAT.*	1.4	Optical counterparts of black widow pulsars are detected and photometric light curves measured to constrain the parameters of the system.
Wang, Yu, (The University of Hong Kong) *Radiation Mechanism of the Soft Gamma-ray Pulsar PSR B1509*	2.7	We use the Outer Gap model to explain the spectrum and the energy dependent light curves of the X-ray and soft gamma-ray radiations of the spin-down powered pulsar PSR B1509.
Wolff, Michael, (Naval Research Laboratory) *X-Ray Pulsations in the Gamma-Ray Pulsar PSR J2214+3000 Discovered with XMM-Newton*	1.8	We report the detection of X-ray pulsations from the gamma-ray pulsar PSR J2214+3000 using the XMM-Newton EPIC-pn instrument in Fast Timing Mode.
Wu, Eric, (The University of Hong Kong) *Exploration of orbital phase-dependent gamma-ray emission from the Black Widow Pulsar*	1.7	We report evidence on orbital phase-dependent gamma-ray emission from the Black Widow Pulsar PSR B1957+20 observed by the Fermi Large Area Telescope. It is suggested that the extra component observed at above ~ 2.7 GeV at certain orbital phases is produced in the intra-binary region via the inverse-Compton process.

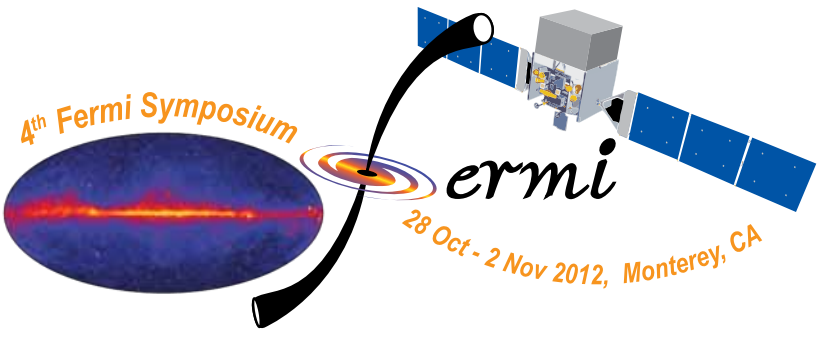
Supernova Remnants and Pulsar Wind Nebulae (SNP)

Acero, Fabio, (NASA GFSC/ORAU) *Is the gamma-ray emission from the SNR HESS J1731-347 leptonic dominated?*	4.4	HESS J1731-347 is a newly discovered SNR sharing many similarities with RX J1713-3946. The GeV of the SNR is investigated with Fermi.
Caragiulo, Micaela, (University and INFN Bari) *Development of a simple multiwavelength modeling for the first Fermi SNR catalog*	3.3	A simple model for SED study of SNRs detected in the first fermi SNR catalog has been developed in order to estimate particle acceleration efficiency, the role of the environment in the observed GeV spectrum and case by case also the electron/proton ratio.
Cardillo, Martina, (INAF-IAPS Roma & Università di Roma Tor Vergata) *W28 and W44:understanding CR acceleration and propagation mechanisms with AGILE and Fermi LAT data*	4.7	Two old SNRs, W28 and W44, seem to be very interesting sources in the context of CR acceleration and propagation.We will do a theoretical and experimental comparison between these important SNRs in order to have a clearer idea of processes that could affect CR acceleration and propagation, and their mutual influence.
Cohen, Jamie, (NASA/GSFC) *Fermi LAT Observations of Supernova Remnants Interacting with Molecular Clouds*	3.4	We present here preliminary results of an automated method for characterizing source regions and identifying extended sources, developed in support of the LAT supernova remnant catalog. We present results for some candidate LAT supernova remnant known to be interacting with molecular clouds, as well as the gamma Cygni SNR and its complex surroundings.
de Palma, Francesco, (INFN Bari) *A Method for Exploring Systematics Due to Galactic Interstellar Emission Modeling: Application to the Fermi LAT SNR Catalog*	3.2	We have developed a method to explore some systematic effects on Galactic Supernova Remnant regions caused by interstellar emission modeling. We will compare the results obtained with eight new GALPROP models with those obtained with the official LAT interstellar emission model.
Dwakardas, Vikram, (University of Chicago) *Exploring the Evolution and Properties of Gamma-Ray Supernova Remnants*	2.1	We explore the properties of gamma-ray SNRs. Using simple semi-analytic arguments coupled with realistic approximations of SNR evolution, we study the gamma-ray emissivity of SNRs, investigate the time evolution of the gamma-ray luminosity due (mainly) to pion decay and leptonic processes for various SN types, and explore the dependence of the flux on SN and ambient medium properties.
Ergin, Tülün, (Bogazici University, Physics Department) *Studying the Supernova Remnant G31.9+0.0 in Gamma and X-Rays*	4.3	G31.9+0.0 (3C 391) gamma-ray and X-ray data collected by Fermi and Suzaku satellites was analyzed. Results of this analysis and discussion of possible emission mechanisms will be shown.
Giordano, Francesco, (University and INFN Bari) *The Analysis Pipeline for the LAT Supernova Remnant Catalog*	3.1	Using the Fermi LAT science tools, a dedicated pipeline has been developed to survey the radio SNR catalog for identify possible GeV emission associated with that.
Hays, Elizabeth, (NASA/GSFC) *Studies of Crab variability in simulated Fermi LAT data*	1.1	We examine the gamma-ray variability of the Crab Nebula by comparing actual LAT data with simulated data generated using different scenarios for the time dependence of the flux and spectrum.
Hewitt, John, (NASA/GSFC) *Fermi LAT and WMAP observations of the Puppis A Supernova Remnant*	4.2	Fermi LAT detects spatially extended GeV gamma-ray emission from the Puppis A SNR. Spectral models that include radio and WMAP data somewhat favor a hadronic model, and require a few percent of the initial explosion energy to be converted to cosmic rays, regardless of the dominant emission mechanism.
Lande, Joshua, (SLAC/Stanford) *Search for Pulsar Wind Nebulae in the Off-Peak Regions of Pulsars in the Second Fermi LAT Pulsar Catalog*	1.3	We perform a search for new Pulsar Wind Nebulae (PWNe) in the regions surrounding LAT-detected pulsars. To do this, we performed a combined spectral and spatial analysis of the regions to determine if the emission is due to a pulsar wind, is magnetospheric in nature, or is undetermined.
Leahy, Denis, (University of Calgary) *HI absorption distances to GeV and TeV emitting supernova remnants*	2.3	Neutral hydrogen (21 cm line) observations are analyzed to obtain kinematic distances for high energy gamma-ray emitting supernova remnants.
Pivato, Giovanna, (University and INFN padova) *Fermi LAT gamma-ray observations of the Supernova remnant HB21*	4.5	We report the results of morphological and spectral analysis of the Supernova Remnant HB21. We also model possible hadronic and leptonic emission mechanisms.

Saha Lab, (Saha Institute of Nuclear Physics) *A Multi-wavelength Study of the Shell of Cas A*	4.1	We present here the analysis results of X-ray and gamma-ray, as well as the multi-wavelength modeling of Cassiopeia A considering archival radio and TeV data along with Chandra and Fermi LAT data.
Uchiyama, Yasunobu, (SLAC) *Discovery of bipolar cosmic rays escaped from SNR W44*	4.6	The discovery of GeV gamma-ray emission from molecular clouds that surround SNR W44 is reported and discussed in light of recent theoretical study.
Weinstein, Amanda, (Iowa State University) *Methods of establishing correlation between extended GeV and TeV emission*	2.2	Establishing the degree to which colocated extended gamma-ray sources detected by Fermi and by ground-based TeV gamma-ray instruments (such as the VERITAS Observatory) share structure is a challenging task. We report here on preliminary studies of a likelihood-based method for establishing correlation, using simulated Fermi and VERITAS observations of spatially extended sources.
Wilson-Hodge, Colleen, (NASA/MSFC) *Hard X-ray Variations in the Crab Nebula*	1.2	We present results of long-term monitoring of the Crab nebula with Fermi GBM, INTEGRAL, MAXI, RXTE/PCA, Swift/BAT, before and after its 7% flux decline in hard X-rays in 2008-2010.

Solar System

Allafort, Alice, (SLAC / Stanford University) *Fermi LAT observations of Long Duration Solar Gamma-ray Flares*	1	With the solar activity ramping up, the Fermi LAT has observed more than a dozen long duration solar gamma-ray flares.
Chernenko, Anton, (IKI) *TGF Spectroscopy Using Multi-Scale Running Correlation Analysis*	4	Spectral analysis of TGFs recorded by GBM instrument is presented, based on Multi-Scale Running Correlation approach.
Cherry, Michael, (Louisiana State University) *Ground Level Observations of Terrestrial Gamma Flashes*	3	Observations are presented of terrestrial gamma flashes detected at ground level in association with nearby lightning.
Orlando, Elena, (HEPL and KIPAC, Stanford University) *Solar and stellar inverse Compton emission: a software package*	2	Software to compute inverse-Compton scattering emission from the heliosphere and the photosphere of stars.
Vandenbroucke, Justin, (Stanford University) *A search for gamma rays from asteroids*	5	We present results of a search for a diffuse gamma-ray glow about the ecliptic plane, produced by small solar system bodies. The method is sensitive to asteroids of size ~1 m, well below the ~km sensitivity limit of other methods.



Agudo, Ivan, (Instituto de Astrofísica de Andalucía (CSIC) & Boston University) *Locating the gamma-ray flaring emission in the jet of blazar AO 0235+164 at >12pc from the central engine*	4.5	We combine the Fermi LAT light curve of the BL Lacertae type blazar AO 0235+164 with time-dependent multi-waveband flux and linear polarization observations and submilliarcsecond-scale polarimetric images at λ = 7 mm to locate the gamma-ray emission in prominent flares in the jet of the source > 12 pc from the central engine.
Aller, Margo, (University of Michigan) *Probing Jet Conditions with Multi Frequency Centimeter Band Linear Polarization: PKS 0420-01*	3.1	Multifrequency radio band linear polarization variability combined with simulations incorporating propagating shocks probes jet conditions in gamma-ray-flaring blazars. Using PKS 0420-01, we illustrate a method for separating blended flares.
Benbow, Wystan, (Harvard-Smithsonian Center for Astrophysics) *Highlights from the VERITAS Blazar Observation Program*	9.2	Blazars are a major focus of the VERITAS collaboration, and nearly 2000 hours of observation, of approximately 130 targets, have been devoted to these objects. Recent highlights of the VERITAS blazar observation program, and the collaboration's long-term blazar observation strategy, will be presented.
Boettcher, Markus, (Ohio University) *Magnetic-Field Generation and Particle Acceleration in Relativistic Shear Layers*	1.3	PIC simulations of relativistic shear layers in radially stratified jets, lead to self-generated magnetic fields and anisotropic particle distributions, resulting in polarized emission, beamed beyond the bulk Doppler boosting.
Bottacini Eugenio (Stanford University) *AGNs with the SIX survey: evolution and circum-nuclear environment*	2.2	The SIX survey is the most sensitive survey at hard X-ray energies. We study the evolution of AGNs and the circum-nuclear environment.
Buson, Sara, (INFN & University of Padova) *Fermi LAT View of a sample of Flaring Gamma-Ray AGN*	8.3	During the first 3.5 years of Fermi observations (i.e 2008 August 4 - 2012 February 4) 91 sources underwent at least one flaring episode at gamma rays. The present work discusses a list of AGNs with daily fluxes brighter than F(E >100 MeV) = 10^{-6} ph cm^{-2} s^{-1}, along with their general characteristics.
Cabrera, Jose Ignacio, (Insatituto de Astronomia Universidad Nacional Autonoma de Mexico) *Modeling the gamma-ray light curve of blazar PKS 1510-089*	1.2	We model the gamma-ray light curve of blazar PKS1510-089 with a uncomplicated shock model
Chatterjee, Ritaban, (University of Wyoming) *An Optical-Near IR Outburst with No Accompanying Gamma-Rays in the Blazar PKS 0208-512*	6.3	The blazar PKS 0208-512 underwent 3 outbursts at optical--near IR wavelengths during 2008-2011 among which the second outburst does not have a contemporaneous brightening in the gamma-rays although it is comparable in brightness and temporal extent to the earlier and later optical flares which do have gamma-ray counterparts. By analyzing its multi-wavelength variability data in details, we speculate that the second optical--near IR outburst was caused by a change in the magnetic field in the emitting region without any change in the total number of emitting electrons or Doppler factor of the emitting region.
Collins-Hughes, Eddie, (University College Dublin) *Observations on Markarian 421 and 501 with the Whipple 10m Telescope and the Fermi LAT*	9.6	The poster will present temporally coincident observations taken from January 2010 to June 2011 with the Whipple 10m Telescope and the Fermi LAT, with an emphasis on Markarian 421 and 501. The results of a search for correlated emission and time-averaged spectral energy distributions will be shown.
D'Abrusco, Raffaele, (Harvard-Smithsonian CfA) *The mid-infrared spectral properties of gamma-ray emitting blazars as an alternative to association through radio-loudness*	5.3	The properties of the gamma-ray emitting blazars in the WISE spectral space seem to be as effective as the presence of radio counterparts for the association of gamma-ray sources. We study the radio and mid-infrared features of a sample of CRATES radio source selected as candidate blazars and compare the subset associated to 2FGL sources to the remaining subset containing unassociated sources.
Dermer, Charles, (NRL) *Radiation Environment and Location of Gamma-ray Emission Regions in Jets from Multiwavelength Spectral Modeling of Flat Spectrum Radio Quasars*	1.1	We use a new technique to model the spectral energy distributions of flat spectrum radio quasars, which returns values of the Doppler factor, magnetic field, and energy densities of the external radiation environment. We compare the spectra and implied radiation energy density to infer the target photon source and the location of the gamma-ray emission site.
Dorner Daniela, (Universität Würzburg) *FACT - on our way to monitor bright TeV blazars*	9.7	With its observations of TeV blazars, the First G-APD Cherenkov Telescope (FACT) provides monitoring results complementary to those of Fermi.

Errando, Manel, (Barnard College - Columbia University) *Simultaneous VERITAS and LAT observations of a BL Lacertae flare in June 2011*	9.4	VERITAS observed a bright BL Lacertae flare in June 2011, exhibiting the shortest variability timescale ever observed in this class of objects and allowing a simultaneous measurement of the GeV flux with Fermi LAT. The size, location, and emission processes responsible for the gamma-ray emission are strongly constrained by these observations.
Falcone Abe, (Penn State University) *Two Swift Public Monitoring Programs on Fermi Blazars and Fermi Unassociated Sources*	7.1	We describe two Swift programs providing valuable, near real-time data on Fermi blazars and unassociated sources.
Fossati, Giovanni, (Rice University) *Time-dependent multi-zone simulations of multiwavelength variability of the powerful FSRQ PKS 1510-089 for external Compton and SSC models.*	1.5	Testing the alternative possible origins of the gamma-ray component and in turn of the location of the dissipation region.
Fukazawa, Yasushi, (Hiroshima University) *2.6 X-ray and Optical observations of GeV gamma-ray emitting Radio galaxies* *10.1 Optical and X-ray observations of unassociated Fermi LAT sources at low Galactic latitude*	2.6 10.1	2.6 We present the X-ray and/or optical observations of GeV radio galaxies, especially for Cen A and NGC1275. 10.1 We performed X-ray and optical observations of three Fermi LAT unassociated sources at low Galactic latitude.
Furniss, Amy, (UCSC) *9.3 VERITAS Observations of Six Bright, Hard-Spectrum Fermi LAT Blazars* *9.5 VERITAS Results from a Deep Exposure on the Distant FSRQ 4C +55.17*	9.3 9.5	9.3 We report on VERITAS very-high-energy observations of six blazars selected from the Fermi LAT 1FGL catalog. TeV upper limits are presented with the contemporaneous Fermi observations and non-concurrent Swift UVOT and XRT data. 9.5 We present upper limit results from a deep VERITAS exposure of the distant flat-spectrum radio quasar 4C +55.17. The high flux, hard index and steady emission found by Fermi LAT observations make this blazar a promising VHE candidate.
Giroletti, Marcello, (INAF Istituto di Radioastronomia) - *2.5 HST-1 kinematics and gamma-ray emission in M87, clues from VLBI dense monitoring* *4.1 The radio properties of the jets in BL Lacs: an unbiased perspective*	2.5 4.1	2.5 We studied with a high resolution and dense monitoring the radio jet of M87. We detect structural variations in the knot HST-1, which may be connected to the very high energy flares in 2005, 2008, and 2010. 4.1 Fermi has revolutionized our knowledge of the high energy properties of BL Lac objects. We present high resolution images of an unbiased sample of BL Lacs to complete the MWL view of this population.
Isler Jedidah, (Yale University) *Understanding the Disk-Jet Connection in Blazars*	6.5	We report on the interplay between the broad emission line region and the relativistic jet in blazars using simultaneous, multi-wavelength data obtained using Fermi and the ground-based SMARTS optical/infrared photometry (1.3m+ANDICam) and optical spectroscopy (1.5m+RCSpec).
Jacobs, Christopher (JPL) *Dual Frequency VLBI Monitoring of a Large Sample of Fermi Sources at 8 and 32 GHz*	4.3	We describe a VLBI program to monitor over 450 Active Galactic Nuclei (AGN) using NASA's Deep Space Network at X and Ka-bands (8 & 32 GHz). This program is sensitive to parsec scale activity in the AGN cores.
Joshi, Manasvita, (Boston University) *Exploring the Location of Gamma-ray Emission in Blazar jets*	1.7	We study the effects of varying the accretion disk and the BLR seed photon fields on a multi-zone time-dependent leptonic jet model, with radiation feedback, to explore the dependence of multiwavelength characteristics of a SED on the location of a particular gamma-ray flare.
Katsuta, Junichiro, (SLAC National Accelerator Laboratory / KIPAC) *Fermi LAT and Suzaku Observations of the Radio Galaxy Centaurus B*	2.8	We present a detailed analysis of about 43 months of accumulated Fermi LAT data and of newly acquired Suzaku X-ray data for a nearby radio galaxy, Centaurus B. A system (an unresolved core and jets) of the source is discussed using the observed data combined with the multiwavelength archived data.
Kazanas, Demosthenes, (NASA/GSFC) *AGN Unification and the Blazar Divide*	1.8	A 2D MHD accretion disk wind model that accounts for AGN Unification and X-ray absorption can explain the difference in the BL Lac-FSRQ Fermi spectra phenomenology
Larionov, Valeri, (Ohio University) *The Outburst of the Blazar S5 0716+71 in 2011 October: Shock in Helical Jet*	6.7	We present the results of gamma-ray monitoring along with optical (R band) photometric and polarimetric observations of the blazar object 5 0716+714 during the outburst in 2011 October. We observed monotonic rotation of the EVPA at a rate of >/~ 50° per night coinciding with a sharp maximum of gamma-ray and optical flux. We analyze the total and polarized intensity images of the blazar obtained with the VLBA at 43 GHz during and after the outburst.
Larsson, Stefan, (Stockholm University) - *3.3 APEX submillimeter monitoring of Fermi blazars: Variability and correlation properties* *8.2 Characteristics of Power Density Spectra for gamma-ray blazars*	3.3 8.2	3.3 APEX submillimeter lightcurves for 40 Fermi blazars are used to study variability and correlation properties with respect to gamma-rays for different types of blazars. 8.2 The properties of Power Density Spectra for Fermi blazars are described, including differences between source types and evidence for characteristic time scales.

Lindfors, Elina, (Finnish Centre for Astronomy with ESO (FINCA), University of Turku) *VHE gamma-ray emission from the flat spectrum radio quasars observed by the MAGIC telescopes*	9.8	MAGIC has observed and detected all the three FSRQs known to be VHE emitters and found that they exhibit very different behavior.
Majid, Walid, (JPL) *Using Parsec-scale VLBI to Improve the Association of Fermi Sources*	10.3	We have made VLBI measurements of 4 pairs of AT20G sources to disambiguate their association with Fermi sources.
Malmrose, Michael, (Boston University) *Investigating the Role of Infrared Emission from a Dusty Torus as a Source of Seed Photons for Gamma-Ray Emission*	6.1	We present NIR flux and polarization observations of several LAT monitored blazars to search the SEDs for evidence of thermal emission from a dusty torus that could be the source of seed photons that are inverse Compton scattered to gamma-ray energies.
Marscher, Alan, (Boston University) *Turbulent Extreme Multi-Zone Model for Multi-waveband Variations of Blazars*	1.6	The author presents a model of blazar variability involving a turbulent plasma that is compressed by a standing shock in a relativistic jet. The numerical results from the model reproduce many of the observed characteristics of the variable emission from blazars.
Massaro, Francesco, (Stanford University) *5.1 The origin of the WISE Gamma-ray Strip* *5.2 TeV blazars at infrared frequencies*	5.1 5.2	5.1 The tight connection found between the IR and the gamma-ray emission for the blazar population require a physical explanation. I will address and clarify this relation with the use of extensive Monte Carlo simulations. 5.2 I will explore the connection between the IR and the gamma-ray emission of the subsamples of TeV detected blazars. I will show that they lie in a distinct subregion of the WISE Gamma-ray Strip from which it is possible to extract new blazars candidates for TeV observations, and associate a low-energy counterpart to those TeV sources still unidentified.
Max-Moerbeck, Walter, (Caltech) *OVRO 40 meter blazar monitoring program: Location of the gamma-ray emission region in blazars by the study of correlated variability at radio and gamma-rays*	3.2	The location of the gamma-ray emission site is studied by investigating the existence of correlated variability between the 15 GHz radio emission and gamma-rays. Methods to study the significance of correlation and observational results are presented.
Miller, Hugh (Georgia State University) *The Variable Optical Polarization of J0948+0022*	2.1	We report the first evidence for rapid variations in the optical polarization for the gamma-ray loud NLSy1 galaxy, J0948+0022.
Mirabal Nestor, (Universidad Complutense de Madrid, Spain) *Machine Learning from Fermi*	10.4	We explore the use of machine-learning algorithms to predict class memberships for unassociated Fermi LAT sources.
Niedzwiecki, Andrzej, (Lodz University, Dept. of Astrophysics) *Gamma-ray emission from hot accretion flows*	2.7	We present a model of gamma-ray emission from ADAFs which can explain the Fermi LAT measurements of M87 and Cen A
Ojha, Roopesh, (NASA/GSFC) *Results from the TANAMI Program*	4.2	We will present key results from the TANAMI program which monitors southern hemisphere blazars at two radio frequencies at parsec scale resolutions.
Orienti, Monica, (Bologna University; INAF-IRA) *The radio and gamma-ray connection at low and high redshift: the case of PKS 1510-089 and TXS 0536+145*	4.4	We investigate the possible connection between high-energy and low-energy bands in two flaring blazars at low and high redshift: PKS 1510-089 and TXS 0536+145.
Orr, Matthew, (Iowa State University) *VERITAS Observations of HBLs*	9.1	Here we present highlights from VERITAS observations of HBLs -- with a particular emphasis on long-term monitoring of hard-spectrum HBLs such as 1ES 0229+200 and PG 1553+113. We also discuss multiwavelength monitoring programs put in place to facilitate the observation of these sources during flaring episodes.
Paggi, Alessandro (SAO) - *5.4 2FGLJ1823.8+4312: the first case of a radio faint gamma-ray blazar?* *5.5 On the cosmological evolution of gamma-ray blazars* *6.8 GALEX view of Fermi blazars*	5.4 5.5 6.8	5.4 One of the unsolved mysteries of gamma-ray astronomy concerns the nature of the unidentified gamma-ray sources. Using the WISE-Fermi association method I identify a source that can be a “radio faint blazar” or the prototype of a new class of extragalactic sources. 5.5 Infrared observations of blazars have proven to be a key tool to investigate the physical processes taking place in these sources. I will use these informations to study the signatures of cosmological evolution in different blazar class sources and their relations with gamma-ray emission. 6.8 Ultraviolet wavelengths represent an interesting and not yet deeply investigated field in blazar physics. Making use of GALEX observations I associate Fermi blazars with ultraviolet sources in order to investigate the relation between the physical processes responsible for the emissions in these energy bands.

Patiño-Álvarez, Victor, (National Institute of Astrophysics, Optics, and Electronics) - *6.2 A multiwavelength cross-correlation variability study of Fermi LAT blazars* *6.6 Optical spectrophotometric monitoring of a sample of Fermi LAT blazars*	6.2 6.6	6.2 We carried out a multiwavelenght cross-correlation analysis of a sample of 16 blazars detected by Fermi LAT using three different statistical methods discussed in literature. The purpose is to investigate if there exists correlations between the distinct bands we analyze in this work. 6.6 We present an optical spectroscopic monitoring of a continuum and broad lines for a sample of Fermi LAT blazars of prominent and variable gamma-ray emission, in order to physically locate the gamma-ray emission.
Poutanen, Juri, (University of Oulu) *Stacked Fermi LAT spectra of blazars confirm stable GeV breaks and the location of the gamma-ray emission zone within the broad-line region*	8.4	Stacked Fermi LAT spectra of blazars confirm stable GeV breaks and the location of the gamma-ray emission zone within the broad-line region.
Reimer, Anita, (University of Innsbruck) *Temporal properties of blazar emission models*	1.4	We present results of a self-consistent time-dependent blazar emission code with focus on the temporal properties of AGN emission.
Saxena Sheetal, (University of Wuerzburg and Barnard College Columbia University) *Analysis of 2FGL Radio Galaxies*	2.3	Of the 11 misaligned blazars in the Fermi Large Area Telescope Second Source Catalog less than half have publicly available Very High Energy data from Cherenkov telescopes. The analysis of this smaller sample is presented in identical time cuts.
Takeuchi, Yuto (Waseda University) *Multiband Diagnostics of Unidentified 1FGL Sources with Suzaku/Swift X-ray Observations*	10.2	We analyzed the X-ray data of 136 unidentified objects from 1FGL catalog. Several sources were particularly noteworthy showing anomalous spectral energy distributions and deeply observed with Suzaku and Swift. This is the first complete set of X-ray data to systematically discuss the natures of unidentified sources.
Tanaka,Yasuyuki, (Hiroshima University) *Fermi and Suzaku observations of candidate extreme blazar HESS J1943+213*	7.2	We report on the analysis of the most recent accumulation of the LAT data at the position of the TeV emitter; the source is still not detected in the GeV range, with the corresponding flux upper limits significantly below the VHE flux level. We also present new Suzaku data for the object obtained in 2011 November.
Thompson, David, (NASA/GSFC) *Long-Term Multiwavelength Studies of High-Redshift Blazar 0836+710*	8.1	High-redshift blazar 0836+710 multiwavelength variability exhibits some complex features. The largest variability is seen at gamma-ray wavelengths.
Torresi, Eleonora, (INAF/IASF Bologna) *Following the MAGN jets swing with the TANGO project*	2.4	Preliminary results from the TANGO (Timing Analysis of Non-Blazar Gamma-ray Objects) simultaneous multiwavelength campaign will be presented. Data from radio-to-gamma-rays are collected by using both ground-based and spatial observatories. The aim is to localize the gamma-ray emitting region(s) in Misaligned AGN (MAGN), a new class of GeV sources. Light curves in different wavebands will be compared seeking for simultaneous photon outbursts, a clear indication of the co-spatiality of the events.
Wagner, Stefan, (LSW Heidelberg) *GeV and synchrotron variations in 0716+714*	6.4	0716+714 varies on a wide range of time-scales. Optical observations since the launch of Fermi exhibit a close match of GeV and synchrotron variability on long and short time-scales, limited only by Fermi sensitivity on 1d timescales.

Dark Matter and New Physics (DMN)

Arvay, Zoltan, Dr. (SBC Cluster) *Evidence of Antimatter core in the center of extended Einstein Rosen Bridge Black Holes and Life on Mars originates from the galactic center of Milky Way*	10	Annihilation cross section is 3×10^{-26} cm^3/s. This is the amount of antimatter which we have seen in the WMAP haze experiment. We state that meteorite ALH84001 contains fossil of a nanosize living organism and so empirical signal of the life on Mars.
Gomez-Vargas, German (Universidad Autonoma de Madrid - IFT UAM/CSIC - INFN Roma Tor Vergata) *Dark matter constraints from the anisotropies of the gamma-ray background measured by the Fermi LAT*	3	The detailed origin of the diffuse gamma-ray background is still unknown. Recent studies have predicted the contributions to the angular power spectrum (APS) from extragalactic and galactic dark matter (DM) annihilation or decay. We have updated the APS measurement with the Fermi LAT using ~ 45 months data, and use accurate predictions for DM anisotropies from state-of-the-art cosmological simulations as presented in Fornasa et al. (arXiv:1207.0502). The new Fermi LAT APS measurements are then compared with their predictions to derive constraints on different DM candidates.
Loparco, Francesco, (Bari University /INFN) *Constraints on dark matter searches from a model independent analysis of Dwarf Spheroidal Galaxies and of the Galactic Halo*	5	We have developed a model independent technique to perform the collective spectral analysis of a sample of 10 dSph Galaxies and of the Galactic Halo using the data collected by the Large Area Telescope onboard the Fermi satellite. This analysis provides upper limits on the dark matter pair annihilation cross section that are well below those predicted by the canonical thermal relic scenario in a mass range from a few GeV to a few tens of GeV.

Ng, Kin-Wang, (Academia Sinica) *Polarized gamma rays and dark matter*	1	We explore the possibility of measuring polarized gamma rays to probe the nature of dark matter..
Ng, Kenny, Chun Yu, (The Ohio State Univeristy) *Searching for sterile neutrinos as decaying dark matter with the Fermi GBM*	2	We searched for decay signatures of sterile neutrinos as a warm dark matter candidate using the Fermi GBM. We report no detection of a signal and put constraints on the parameter space of this scenario.
Nieto, Daniel, (Columbia University) *Dark Matter Detection Prospects for the Cherenkov Telescope Array*	9	We present the dark matter detection prospects of the planned Cherenkov Telescope Array for different array layouts. We explore several observational strategies and classes of targets.
Sagar, Arvind, (University of Lucknow) *Theory of everything and absolutely nothing .....failure of big bang*	11	Theory Of Everything And Absolutely Nothing
Sanchez-Conde, Miguel, (KIPAC/SLAC, Stanford University) - *4 The viability of low mass subhalos as good targets for gamma-ray dark matter searches* *6 Constraints on Dark Matter Models from the Inner Galaxy gamma-ray emission measured by the Fermi LAT*	4 6	4 Cold dark matter (DM) halos have substructure with masses all the way down to a minimum mass ranging between 10^{-3} to 10^{-12} solar masses. Some of them might be amongst the best astrophysical candidates for gamma-ray DM searches. Using Via Lactea II and Aquarius, and extrapolating subhalo properties below the resolution of both simulations, we estimate that there might be up to thousands of low mass subhalos brighter than Draco in gamma-rays. We also perform some subhalo detectability predictions for the Fermi satellite. 6 Using the total fluxes (background+signal) measured by the Fermi LAT in regions around the Galactic Center (GC), we derive constraints on the parameter space of generic DM candidates simply requiring that the DM-induced gamma-ray emission does not overshoot the total flux measured by the Fermi LAT in an optimized region around the GC. We find limits on the annihilation cross section that are comparable to the ones previously reported by Fermi after a similar analysis of the Galactic halo. When adiabatic contraction is taken into account, the limits improve by almost three orders of magnitude, going below the thermal cross section for all annihilation channels (except μμ). Our limits improve when Inverse Compton scattering is also taken into account.
Spengler, Gerrit, (Humboldt University Berlin) *Strategies for the Detection of Gamma Rays from Dark Matter Annihilation Towards the Galactic Centre Region with the High Energy Stereoscopic System*	8	Strategies for the improvement of the sensitivity of imaging atmospheric Cherenkov telescopes for very high energy gamma rays from particle dark matter annihilation towards the galactic center region are presented.
Su Meng, (MIT/Harvard) *Strong Evidence for Gamma-ray Line Emission from Fermi LAT*	7	Fermi LAT data shows resolved gamma-ray line feature at 110-140 GeV from the inner Galaxy. Spectrum of unassociated point sources in the Second Fermi LAT catalog also show evidence of line emission at 111 GeV and 129 GeV.

(GRB) Gamma-Ray Bursts

Bagoly, Zsolt, (MTA CsFK Konkoly Observatory) - *Background fitting of Fermi GBM observations*	10	We summarize the result of our new background fitting method of Fermi GBM data, regarding all GBM triggers.
Balázs, Lajos, (MTA CsFK Konkoly Observatory) *Dependence of the optical brightness on the gamma and X-ray properties of GRBs*	7	Using survival analysis we studied the dependence of the optical brightness and the gamma and X-ray properties of the Swift GRBs.
Barnacka, Anna, (Nicolaus Copernicus Astronomical Center) *New constraints on primordial black holes abundance from femtolensing of gamma-ray bursts*	16	We present new constraints on primordial black holes abundance in the mass range 10^{17} - 10^{20}. To search for the femtolensing effects caused by compact objects we used gamma-ray bursts with known redshifts detected by the Fermi Gamma-ray Burst Monitor (GBM).
Bissaldi, Elisabetta, (UIBK) *Duration-energy analysis of bright high-energy GRBs detected with Fermi GBM and LAT*	1	We explore the duration–energy relation of a sample 136 bright GRBs detected by Fermi-GBM up to 10 MeV and, when possible, up to 1 GeV in LAT.

Blackburn, Lindy, (NASA/GSFC) *Techniques for targeted GBM follow-up of gravitational-wave events*	19	We present a fully-automated, targeted search strategy for prompt electromagnetic counterparts to gravitational-waves from binary coalescence in offline GBM data. The multi-detector method makes use of a detailed model response of the instrument, and benefits from time and sky location information derived from the gravitational-wave signal.
Guiriec, Sylvain, (NASA/GSFC) *Impact of the photospheric component on the GRB prompt emission spectral shape and effects on the Epeak-Luminosity relation*	14	In this presentation, we will see how the recently discovered energetically sub-dominant photospheric emission impacts our understanding of GRB prompt emission and may reveal the nature of the non-thermal component of the spectrum. We will also see how this thermal component affects the famous E_{peak}-Luminosity relation for cosmology and could unveil its intrinsic nature
Kocevski, Daniel, (NASA/GSFC) *Fermi LAT Stacking Analysis of Swift localized GRBs*	6	We present the results of a stacking analysis of Swift detected GRBs with XRT localizations that fell within the LAT field-of-view at the time of trigger prior to Feb 1st, 2012. We find no evidence for a significant detection in the co-added counts and likelihood maps.
Li, Zhuo, (Peking University, Beijing, China) *Consitraint of GRB neutrino flux by Fermi observations*	18	We use gamma-ray burst (GRB) detection by Fermi to put a stringent upper limit on the GRB neutrino flux.
Liang, Edison, (Rice University) *Relativistic Shear Flow Model of Gamma-Ray Bursts*	13	We will present simulated GRB spectra based on PIC simulations of relativistic shear flow boundary layers.
Longo, Francesco, (Dipartimento di Fisica, Universita' di Trieste and INFN Trieste) - 2 *The observation of GRBs with AGILE*	2	We review the status and the results of the observation of GRBs with AGILE and we discuss the the main features (extended and delayed emission, possible spectral evolution) of the observed events. We discuss also the theoretical implications of the not-detected GRBs in the AGILE field of view.
Pelassa, Veronique, (University of Alabama in Huntsville) - *9 Performance of the Fermi LAT Low Energy Event Selection* *20 Short GRB from compact mergers, the complementarity of Fermi GBM and advanced LIGO/Virgo*	9 20	9 We will present a validation study of the Monte-Carlo simulations which are used to derive the Instrument Response Functions for the Fermi-LAT Low-Energy event selection, with particular emphasis on the estimation of the associated systematic uncertainties which are relevant for GRB spectral reconstruction based on LLE data. 20 We provide predictions for the rate of joint detections of short GRB from compact mergers by the Fermi Gamma-Ray Burst Monitor and the Advanced LIGO/Virgo detectors.
Pesce-Rollins, Melissa, (INFN-Pisa) *New Fermi LAT analysis reveals more high energy gammas in GRBs*	8	Using the new Fermi LAT tracker reconstruction and calorimeter clustering algorithms, we have re-analyzed eight GRBs previously detected by the LAT for which an x-ray/optical follow-up was possible and found four new photons with energies greater than 10 GeV in addition to the six previously known.
Pozanenko, Alexei, (Space Research Institute (IKI)) *Model and implications of the extended emission of short gamma-ray bursts*	12	We consider two jets model of short duration burst with extended emission. The model involves a short-duration jet, which is powered by heating due to ν-antiν annihilation, and a long-lived Blandford--Znajek (BZ) jet with a significantly narrow opening angle.
Ryde, Felix, (Royal Institute of Technology, Stockholm, Sweden) *Photospheres in GRBs: Lessons learned from Fermi*	15	I will summarise the lessons learned from Fermi observations regarding the behaviour of the photosphere in the relativistic jet in GRBs.
Ukwatta, Tilan, (Michigan State University) *Gamma-Ray Burst analysis for the masses: grbcatalog.org*	3	We announce the launch of grbcatalog.org, a web portal dedicated to Gamma Ray Burst (GRB) studies.
Vianello, Giacomo, (Stanford University) *Detection of spectral cutoffs in two Fermi GRBs with the new LAT Low Energy class (LLE)*	4	We report on the detection of spectral cutoffs in the spectra of two Fermi GRBs. Such cutoffs have been observed for the first time in the high-energy powerlaw of the Band model, between 20 and 100 MeV.
Zaborov, Dmitry, (Pennsylvania State University) *The HAWC observatory as a GRB detector*	17	HAWC will study high energy components in GRB spectra by observing air showers at high altitude. A first upper limit obtained with a small HAWC prototype is presented.
Zheng, Weikang, (University of Michigan) *Searching for extended emission of high-energy photon (> GeV) from GRBs in Fermi LAT data*	11	We are searching lower flux LAT GRB events to test whether the phenomena of late time high-energy photon emission observed in those more prominent GRBs can be extrapolated to lower intensity bursts.
Zhu, Sylvia, (NASA/GSFC/UMD) *Fermi observations of GRB 100116A*	5	We present a temporal and spectral study of the prompt and afterglow emission of GRB100116A, detected by all of the instruments on the Fermi satellite.

(OEG) Other Extragalactic

Arlen, Timothy, (UC Los Angeles) *Constraining weak intergalactic magnetic fields: prospects for the Fermi LAT and IACT experiments*	3.1	We illustrate the capabilities of the Fermi LAT to advance IGMF studies through the potential detection of gamma ray “halos” around AGN and/or detection of delayed HE “echos” of intense AGN VHE flares.
Chakraborty, Nachiketa, (University of Illinois, Urbana-Champaign) *The Cosmic Star-Forming, Diffuse Gamma-ray Background*	3.2	Calculation of the contribution of the star-forming galaxies to the diffuse extra-Galactic background measured by Fermi LAT, shows that the best case model could be a significant fraction of the background. A new calculation of inverse-Compton scattering of the interstellar photons off cosmic ray electrons shows it to be subdominant to the neutral pion decay, which dominates the star-forming contribution throughout the Fermi LAT range.
Ciprini, Stefano, (ASI Science Data Center & INAF Rome) *Four Years of Fermi LAT Flare Advocate Activity*	1.2	A progress report of the Fermi Flare Advocate program (also known as Gamma-ray Sky Watcher, FA-GSW service) is illustrated.
Donnarumma, Immacolata, (INAF-IAPS) *MeV blazars: results and perspectives with next generation gamma-ray telescopes*	2.1	We will discuss the results carried out by Fermi on the study of the Extragalactic Gamma-ray Background with particular emphasis on blazar contribution at lower energies.
Errando, Manel, (Barnard College - Columbia University) *Statistical classification of unidentified LAT sources based on their gamma-ray properties*	1.1	Based on the gamma-ray properties of the 2FGL classified sources, we use random forest classification and supervised clustering algorithms to suggest tentative classifications for sources whose properties resemble those of blazars, pulsars and supernova remnants / pulsar wind nebulae.
Finke, Justin, (US Naval Research Laboratory) *Extragalactic Background Light Constraints with Fermi and TeV Observations of Blazars*	2.2	We use LAT spectrum for blazars, extrapolated into the TeV band, as the maximum possible intrinsic spectrum from a source, and compare this to the observed TeV spectrum. This allows us to constrain the EBL as well as the intergalactic magnetic field.
Galante, Nicola, (Harvard-Smithsonian Center for Astrophysics) *Highlights from the Extragalactic non-Blazar Program of VERITAS*	3.6	VERITAS is an array of four 12-m diameter imaging atmospheric-Cherenkov telescopes located in southern Arizona. Its aim is to study the very high energy (VHE: E>100 GeV) gamma-ray emission from astrophysical objects. The VERITAS extragalactic non-blazar research program and its related results are presented.
Gasparrini, Dario, (ASDC/INAF) *Fermi view on BL Lac Objects: Luminosity Function and population properties*	2.3	The properties of BL Lac objects in the 2LAC sample and the derivation of the first luminosity function of gamma-ray selected BL Lac objects and an estimate of the contribution of this population to the EGB with implications for the formation of the >10 GeV background
Giebels, Berrie, (LLR Ecole Polytechnique) *Status and recent results from H.E.S.S.*	3.5	A Status of the most recent HESS observatory achievements, the GeV to TeV connection, and synergies allowed by the Fermi observatory, will be presented. An update on the successful commissioning of the new HESS2 telescope, as well as a status of the first observations, will be provided.
Inoue, Yoshiyuki, (KIPAC/SLAC) *Upper Limit on the Very High Energy Cosmological Gamma-ray Background*	2.4	The extragalactic gamma-ray background (EGB) measurement sets an upper limit on EGB itself at very high energy (VHE). We set the limit as the cascade emission from VHE EGB not to exceed the current EGB measurement.
Leahy, Denis, (University of Calgary) *The “double-humped” super-luminous supernova SN2006oz*	3.8	SN2006oz is a super-luminous supernova with a bright precursor, suggestive of a double explosion. We apply the dual-shock quark nova model for super-luminous supernovae to show that it can explain the observed light-curve of SN2006oz.
Mahabal, Ashish, (Caltech) *Identifying optical counterparts to unassociated Fermi sources from variability*	3.4	We use data from synoptic surveys like Catalina Real-time Transient Survey (CRTS) to characterize variability of a large number of different types of variables and transients. We demonstrate that by identifying optical counterparts to unassociated Fermi sources.
McLin, Kevin, (Sonoma State University) *A Web-based Cosmology Curriculum Incorporating Research into Student Understanding of Basic Cosmological Concepts*	3.9	We present a new curriculum in cosmology for introductory level non-science students. The curriculum uses online interactive exercises and real data to teach modern cosmology.
Staszak, David, (McGill) *Results from the VERITAS High-Energy LAT Photon ToO Program*	1.3	During the 2011-2012 observing season, VERITAS implemented a new target of opportunity (ToO) program to trigger VERITAS observations on a small sample of the highest energy LAT photons. Each photon that triggered observation was detected by the LAT within the previous 24-hour period and was not spatially associated with a known VHE emitter.
Stecker, Floyd, (NASA/GSFC) *An Empirical Determinaton of the EBL and Gamma-ray Opacity*	1.4	We give a new determination of the EBL and gamma-ray opacity $tau(E,z)$ and compare with Fermi results.

Storm, Emma, (UCSC) *Gamma Rays from Star Formation in Galaxy Clusters*	3.7	We report on the gamma ray emission associated with star formation in nearby clusters of galaxies, and find that the emission is within an order of magnitude of the published upper limits.
Tsai, An-Li, (Institute of Astronomy, National Central University) *Multi-wavelength Identification of the Unidentified Fermi Objects*	3.3	We aim to look for the source type of Unidentified Fermi Objects released in 2FGL Catalog via multi-wavelength data.
Venters, Tonia, (NASA/GSFC) *The Impact of Gamma-ray Halos on the Angular Anisotropy of the Extragalactic Gamma-ray Background*	2.5	As very high energy (VHE) photons propagate through the extragalactic background light (EBL), they interact with the soft photons of the EBL and initiate electromagnetic cascades of photons and electrons. Through deflections of the charged particles of the cascades, an intergalactic magnetic field (IGMF) may leave an imprint on the anisotropy properties of the EGB.

http://fermi.gsfc.nasa.gov/science/mtgs/symposia/2012/

4th International Fermi Symposium

Monterey Bay Aquarium

j y k

Strolling Dinner and Hosted Bar

q i g

Wednesday October 31st, 2012

19:00pm - 22:30pm

Music by "East-Moves-West"
Sepp Hammer – Baritone
Jonelyn Langenstein – Soprano
Jungmee Kim – Accompanist

Popular Lecture

20:00 pm in auditorium

"Sushi and satellites: Tracking Top Marine Predators Across the Blue Planet"

Professor Barbara Block
Stanford University