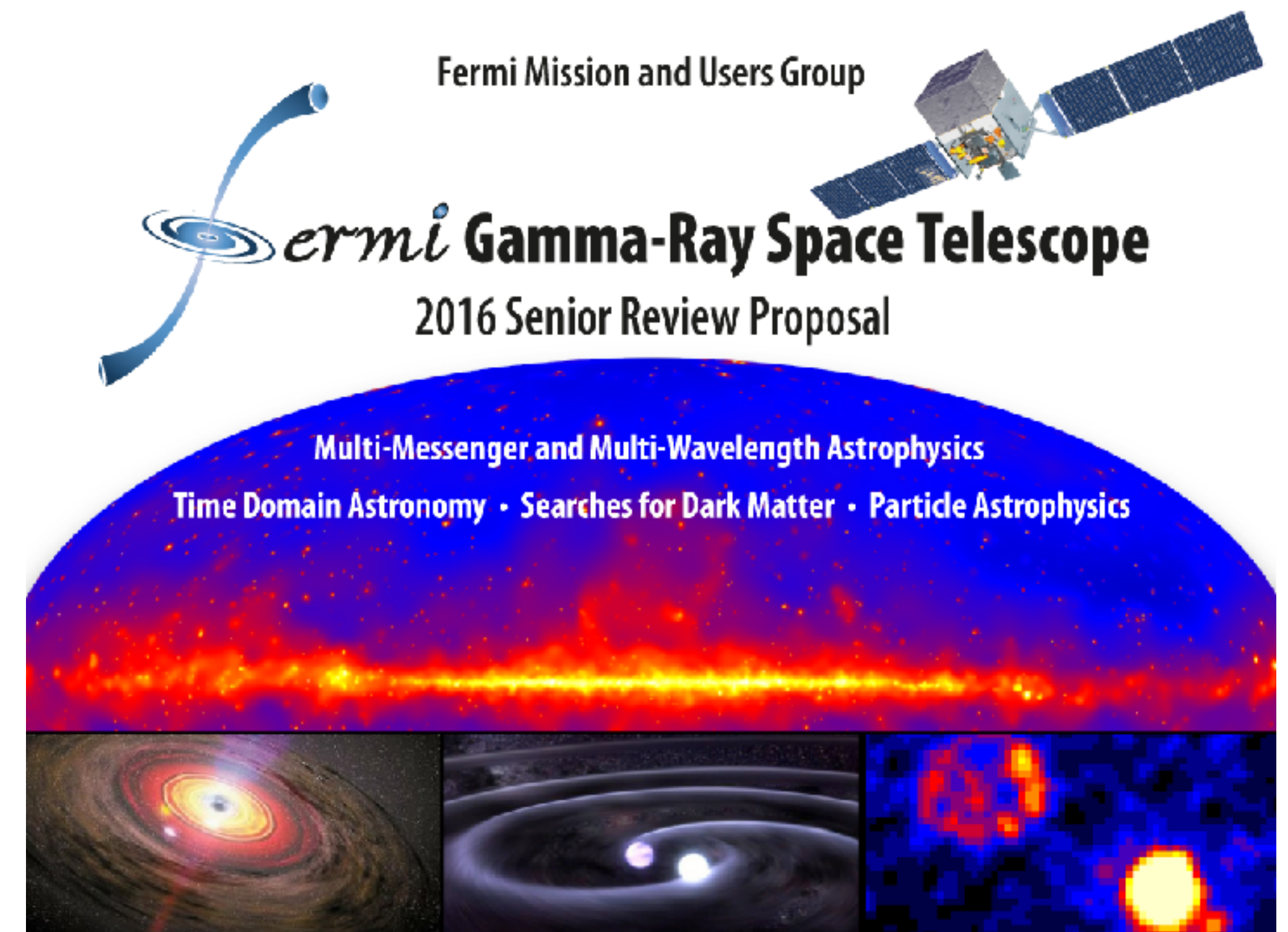


2019 Fermi Senior Review

Judy Racusin (NASA/GSFC)

Refresher - 2016 Senior Review

- Science Themes
 - Time Domain, Dark Matter, Particle Astrophysics
- Initiatives
 - reduce data latency, transient detection pipelines on various timescales, faster notifications leading to ToOs
 - LAT
 - higher energies - diffuse improvements
 - lower energies - earth limb, PSF, IRFs, diffuse
 - 4FGL
 - Long-term monitoring
 - HEALPix, more efficient TS maps, weighted binned likelihood
 - GBM
 - GBM - XSPEC integration



Refresher - 2016 Senior Review

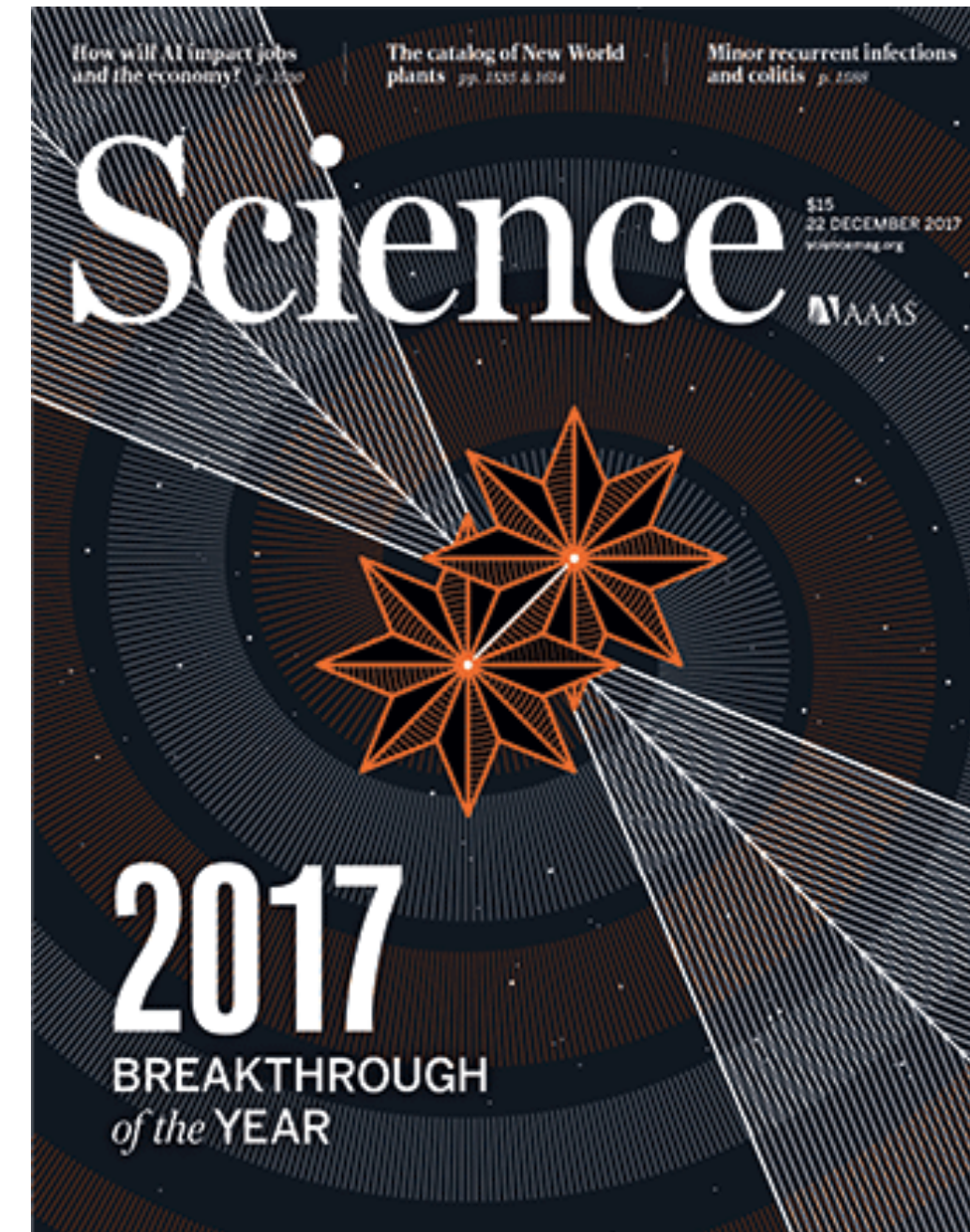
- Progress - Pass 8 is a success, LIGO is coming
- Constraints
 - Requested flat budget including taking on additional NASA functions due to DOE ramp down
- Results (<https://science.nasa.gov/astrophysics/2016-senior-review-operating-missions>)
 - Recommended to continue, but ranked 5 out of 6 missions in main panel

OVERALL ASSESSMENT

Fermi, the only space born GeV gamma-ray astrophysics observatory world wide, has exciting potential for multi-messenger astrophysics and provides unmatched capabilities for time domain astronomy and astroparticle physics. It thus plays an important role in NASA's mission portfolio. In view of the absence of another MeV/GeV observatory in the foreseeable future, substantial cost reductions of the annual budget are highly desirable when compared to potential termination, as cost economies could enable NASA to support Fermi for an extended period of time. Should there be a NASA budget shortfall requiring reductions of the Fermi support, it should be emphasized that maintaining Fermi's GBM is a particularly high priority as it may become a crucial player in the search for electromagnetic counterparts of gravitational wave events. The SR2016 panel identified the planned reduction of the DOE support for the mission as a concern; the transition presents a significant challenge to smooth acquisition, calibration and distribution of the data, as well as possible added cost for NASA.

2019 Senior Review

- Cadence changed to every 3 years
 - Good thing! 2017 was a very good year for Fermi!
- Schedule
 - Call will be out in Sep/Oct?
 - First draft - goal September
 - Iteration with LAT, GBM, FUG in October/November
 - Presumed proposal due date - Dec 2018/Jan 2019
 - Presentation - Feb/Mar 2019
- Procedure
 - Sometimes in past - white papers/community input on new science over next few years, Fermi symposia
 - Written primarily by small group - Dave, Seth Digel (SLAC), Judy, Julie, Liz (TBC)
 - Share series of drafts open for comment



Senior Review Wiki Access

- If you do not already have access to the Fermi Senior Review confluence pages (the internal wiki), here are instructions on how to gain access.
- If you're new to the FUG (since the last SR) and do not have a confluence account, please create one by filling out this form (<http://jira.slac.stanford.edu/signup/>), and select your group as the "Fermi Users Group".
 - If you have forgotten your user ID or password, you can retrieve it with this form:
 - <https://crowd.slac.stanford.edu/crowd/console/forgottenlogindetails!default.action>
- The main senior review confluence area is here, with access to the previous 2 proposal areas:
 - <https://confluence.slac.stanford.edu/display/FSR/Home>
- 2016 Senior Review (drafts, support material, development pages, post comments on draft pages)
 - <https://confluence.slac.stanford.edu/display/FSR/Fermi+Senior+Review+2016>
- 2019 Senior Review pages - to be created

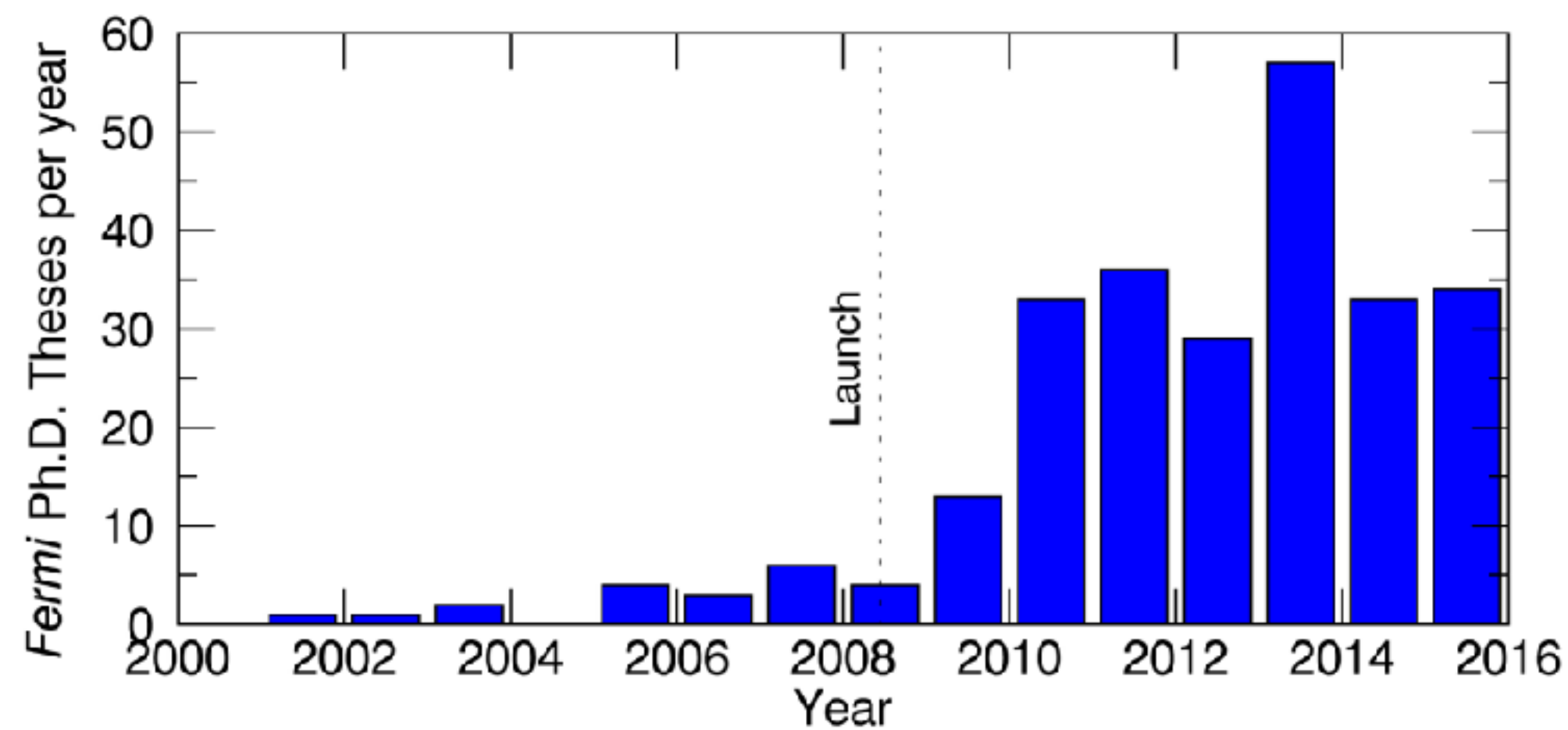
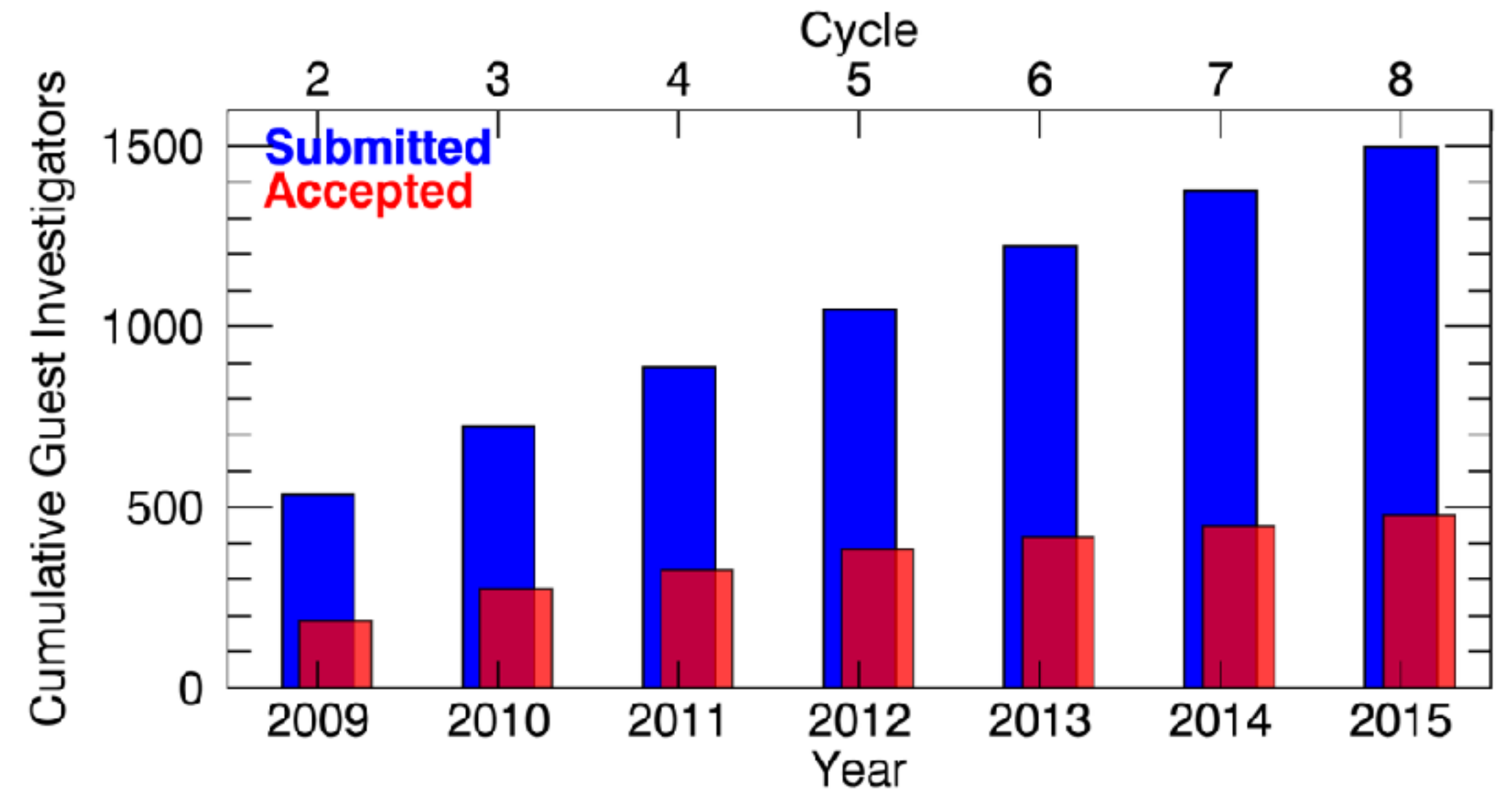
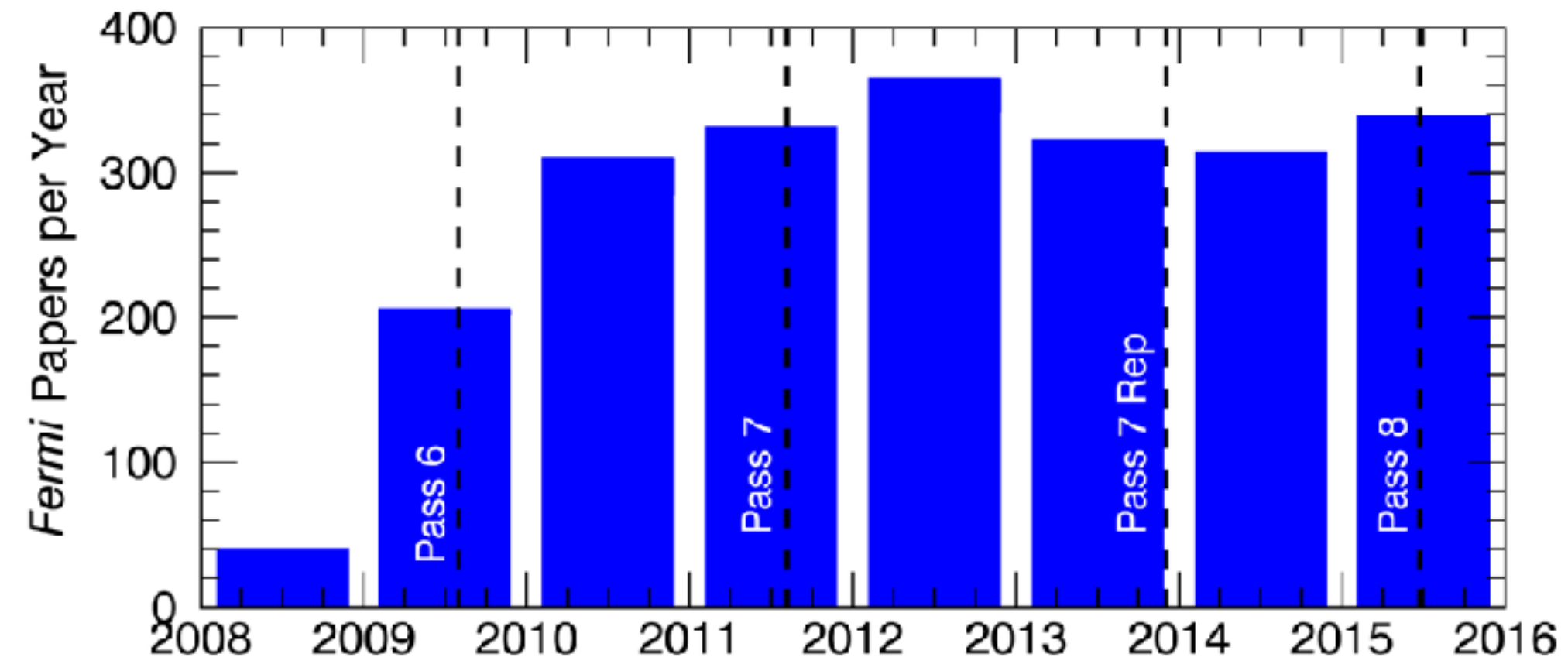
2019 Senior Review Themes

- Multi-messenger/Multi-wavelength Astrophysics
 - Gravitational Wave Counterparts
 - GBM is the most prolific detection of short GRBs currently operating
 - not just lucky, but prepared, and there's more work to do
 - Neutrino Counterparts
 - LAT is only instrument that can monitor whole GeV sky for blazar flares
 - need more automation in identification of potential joint events
 - Transients in association with new optical/radio sky surveys
- All other topics are difficult to promise something new in next 3 years relative to last 10

2019 Senior Review Initiative Ideas

- LAT Calorimeter-only event class?
- New automation/pipelines initiatives?
- Additions to Fermipy?
- New software?
- New catalogs?
- What else?

Metrics (need to update)



Fermi Bibliography
https://fermi.gsfc.nasa.gov/cgi-bin/bibliography_fermi

Other ideas?

2019 Senior Review Very Rough Outline

- (Not necessarily in this order)
- Demonstrate science success - GWs & Neutrinos, catalogs, other major discoveries
- Discuss DOE transition of responsibilities and other promises of 2016 SR
- Demonstrate that Fermi is uniquely placed for multi-messenger discoveries in next 3 years
- Describe how Fermi will get even better (new initiatives?)
- Demonstrate that Solar Panel anomaly isn't a hinderance to operations and science - spin as a positive (e.g. detect fainter flares on weeks timescale in region of sky with higher exposure)

Discussion