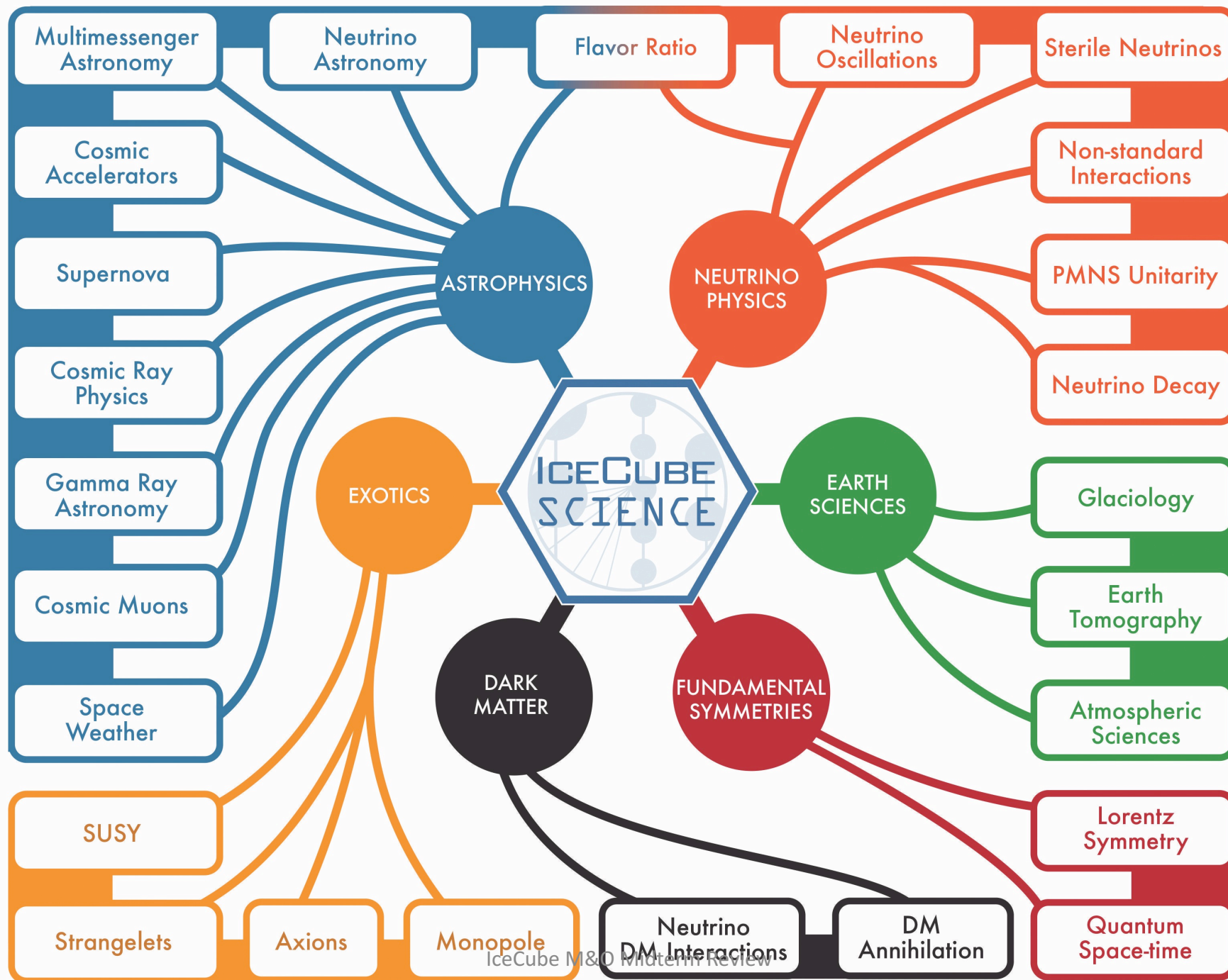


# Analysis Coordination and Publications

Dawn Williams

Maintenance and Operations Mid-term Panel Review



# IceCube Analysis

- IceCube analysis continues to evolve
- Many analysis use common data sets
- Some analysis use common software
- New analysis methods continue to be proposed
- New data sets are in various stages of development
- High statistics analyses like oscillation are systematics limited, systematics becoming important for astrophysical neutrinos

# Analysis review cycle



# New WG structure in 2018


Main motivations:

1. Consolidating topics
2. Improving communication between working groups on systematics
3. Moving some technical tasks out of overburdened working groups

Analysis WG	Convenor(s)
Diffuse	Claudio Kopper, Klas Hultqvist
Neutrino Sources	Naoko Kurahashi Neilson, Ignacio Taboada
Beyond Standard Model	Carsten Rott, Anna Pollman
Cosmic Rays	Kath Rawlins, Dennis Soldin
Oscillation	Juan Pablo Yanez, Tom Stuttard
Supernova	Lutz Koepke, Segev BenZvi

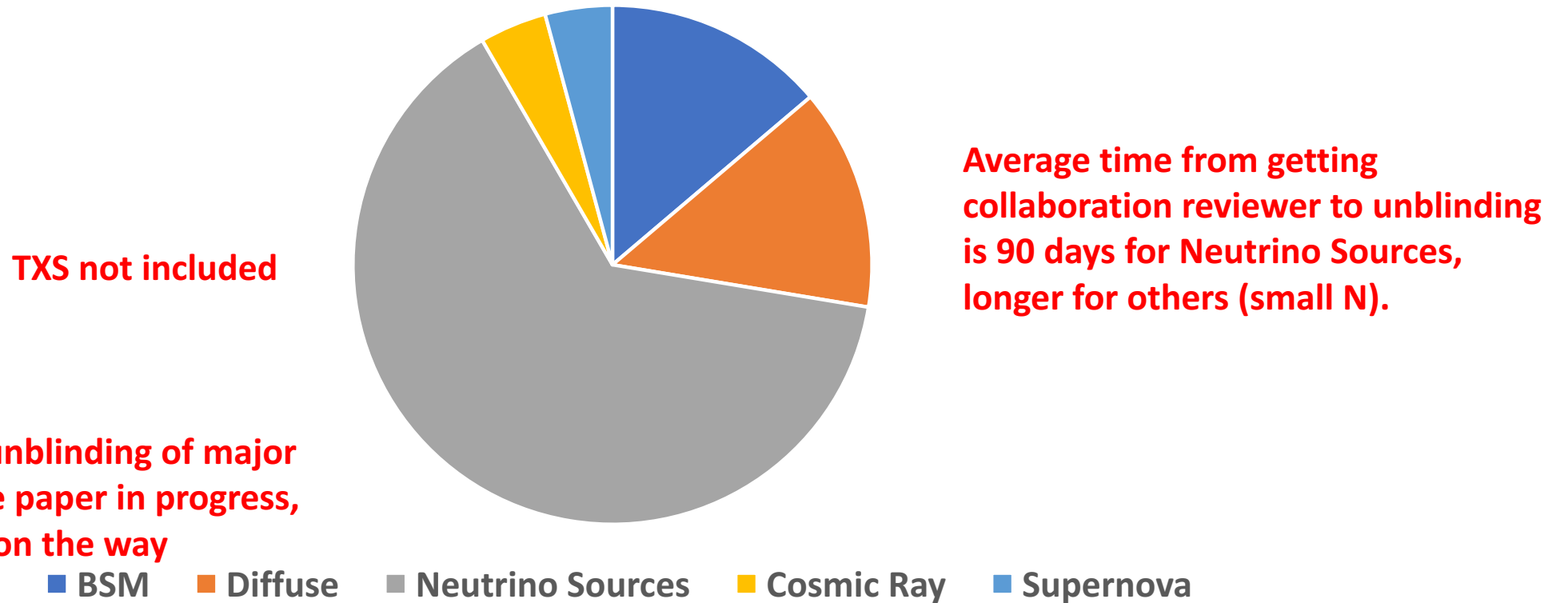
Technical WG	Convenor(s)
Realtime	Erik Blaufuss
Calibration	Summer Blot, Keiichi Mase
Systematics and Reconstruction	Joshua Hignight, Jakob Van Santen, Juanan Aguilar
Systematics Coordinator	Nathan Whitehorn

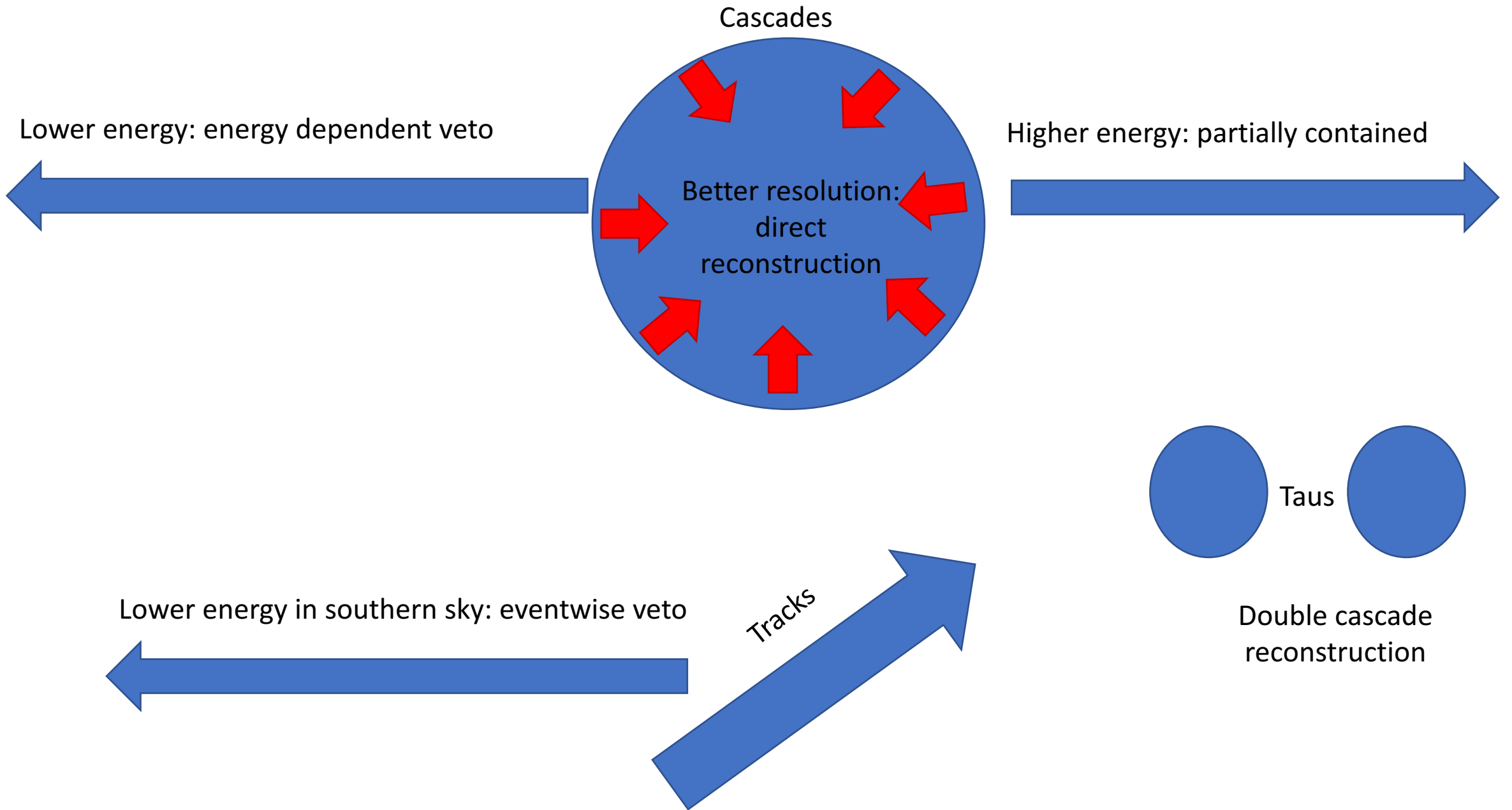
# Working group technical personnel

Role/Area	Tech Lead	Affiliation	Data Curator	Affiliation	Current Datasets
Neutrino Sources WG	Joshua Wood	UW-Madison	<a href="#">Liz Friedman</a> 	UMD	<a href="#">Nu Sources Datasets</a>
Oscillations WG	Philipp Eller	PSU			
Diffuse WG	Lu Lu	Chiba U.			
Cosmic Rays WG	Katherine Rawlins	U. Alaska			
Beyond Standard Model WG	Carlos Argüelles	MIT			

# Analyses over the past year

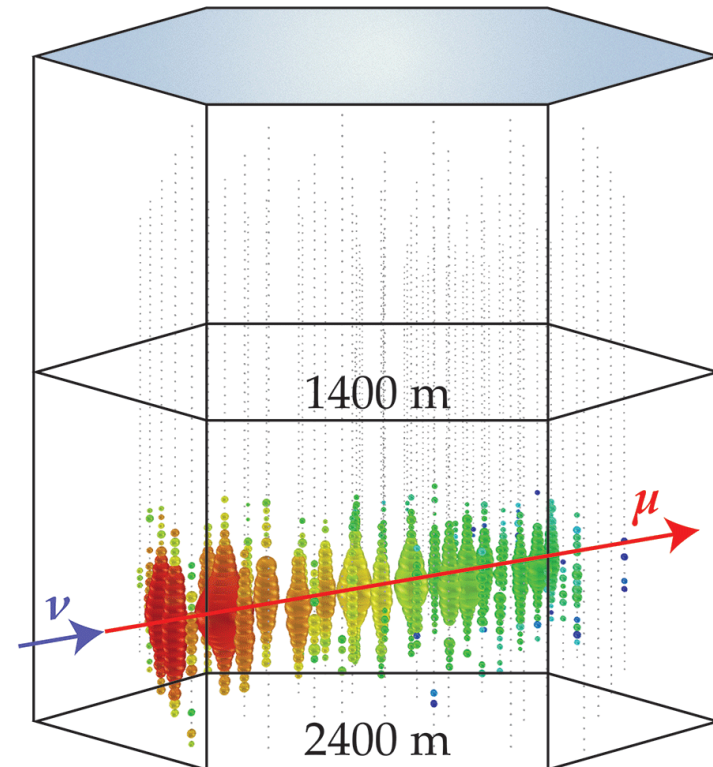
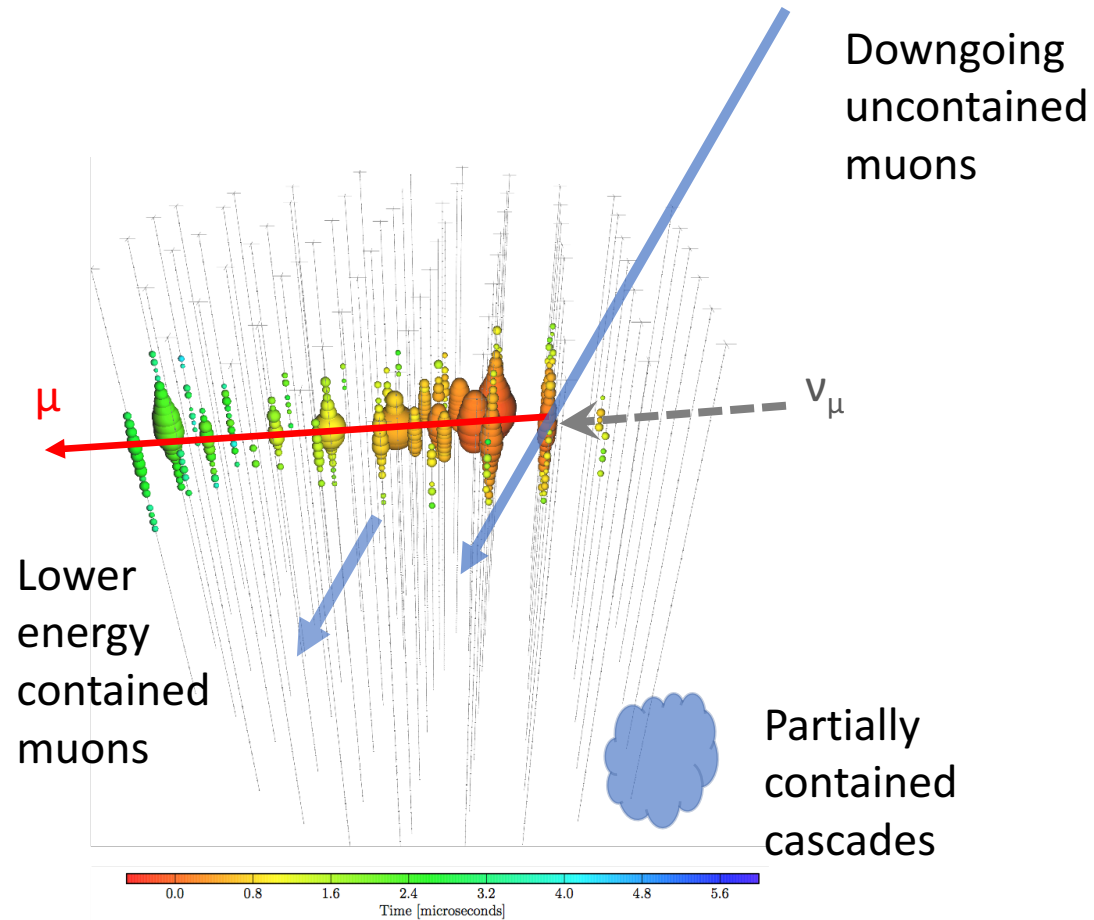
Analyses That Entered Review and Were Unblinded September 2017-2018





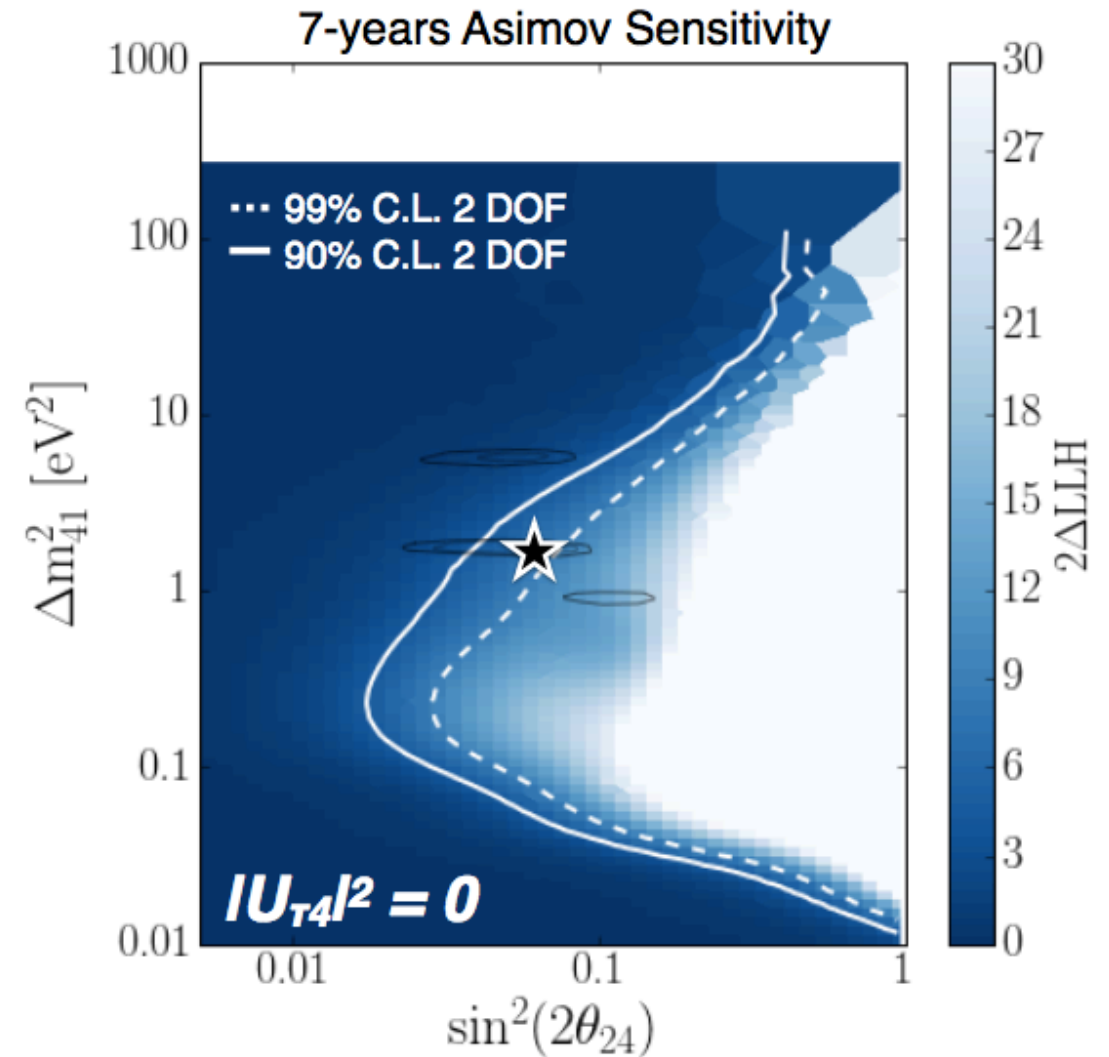


# New samples in progress



# Selected Analyses on the horizon

- Multi-flare blazar search and many more multimessenger and realtime campaigns
- Updated sterile neutrino analysis
- OscNext oscillation analysis
- Global fit of multiple diffuse neutrino data samples



# M77 (figure to be added)

- Recent result: combined muon sample with updated catalog, showed a warm spot near M77, result communicated as preliminary to MOU partners (private comm based on time integrated result), not public release/realtime)

# Internal data release protocol

- For unblinding, **data sample** must be in the data warehouse and **software** (analysis scripts beyond core software) must be in SVN or GitHub, **documentation** must be complete
- Technical coordinator/data curator of analysis WG must sign off on this
- For publication, higher threshold: analysis must be able to be reproduced. This is only reproduction of high level results, not reproduction of all data processing

# Internal data release protocol



# External data releases

- Text format data release of 3 years of tracks in October
- Looking into next generation of data releases: supporting versions, different types of data sets, database functionality
- A data release task force has been convened to look into this
- Possible solutions being investigated include High Energy Astrophysics Archive for NASA (HEASARC) and Italian Space Energy Space Science Data Center

# Papers in Progress

## Papers in Progress

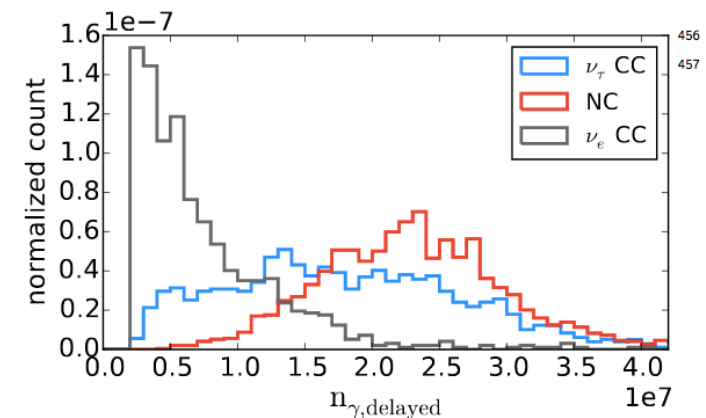
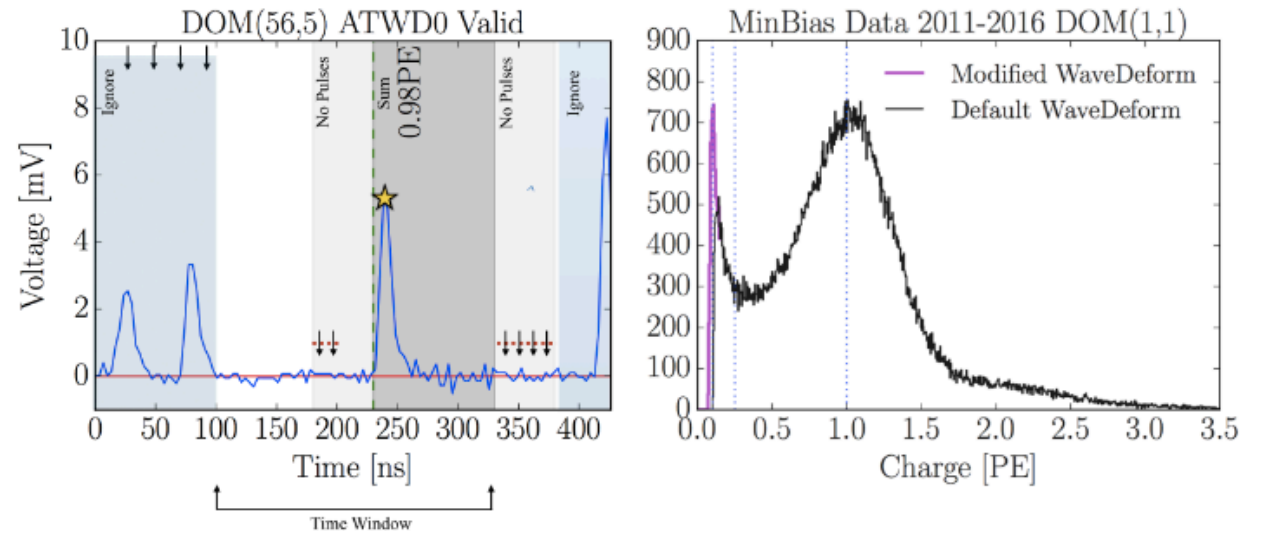
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[\[edit\]](#)

- [FRB search with Level2 tracks and SNDAQ](#) Added 2018-12-05
- [Pan-STARRS IceCube Paper](#) Added 2018-11-13
- [Cascade Type Distinction](#) Added 2018-10-30
- [Non-Poissonian Template Fitting](#) Added 2018-10-11
- [SPE Templates Paper](#) Added 2018-09-22
- [Density of GeV muons in air showers measured with IceTop](#) Added 2018-09-22
- [Search for PeV Gamma Rays with 5 Years of Data from the IceCube Observatory](#) Added 2018-09-22
- [3 Year Energy Spectrum and Composition](#) Added 2018-09-22
- [Search for Large Scale Northern Sky Cosmic Ray Anisotropy with 6 Years of IceCube Atmospheric Neutrinos](#) Added 2018-09-22
- [Gamma-ray counterparts to high-energy neutrinos detected by IceCube](#) Added 2018-08-22
- [Neutrino Mass Ordering Paper with 3 Years of DeepCore \(DRAGON and GRECO analyses\)](#) Added 2018-08-03
- [Measurement of Atmospheric Tau Neutrino Appearance with IceCube DeepCore](#) added 2017-11-10
- [Upper Limits on High Energetic Neutrinos from Core Collapse Supernovae using the IceCube Neutrino Telescope](#) added 2017-11-01
- [Veto techniques for selecting neutrinos below 100 TeV from the southern sky with the IceCube detector \(LESE/STeVE\)](#) Added 2017-08-21

# Technical and new methods papers

- New SPE Templates
- Application of Non-poissonian template fitting to point source searches
- Cascade type distinction
- Forthcoming: deep neural network reconstruction of IceCube cascades





# Recently approved paper outlines

- Neutrino sources
  - 7 year medium energy cascade analysis with DNN reconstruction
  - 2MRS correlation paper
- Future technologies
  - IceACT demonstrator paper
  - JUNO/PINGU combined NMO sensitivity

# Selected Paper outlines expected soon

- HESE 7 year analyses, including first glimpse of high energy tau neutrino
- Neutrino cross section with cascades
- First hint of the Glashow resonance in IceCube data

# Backup