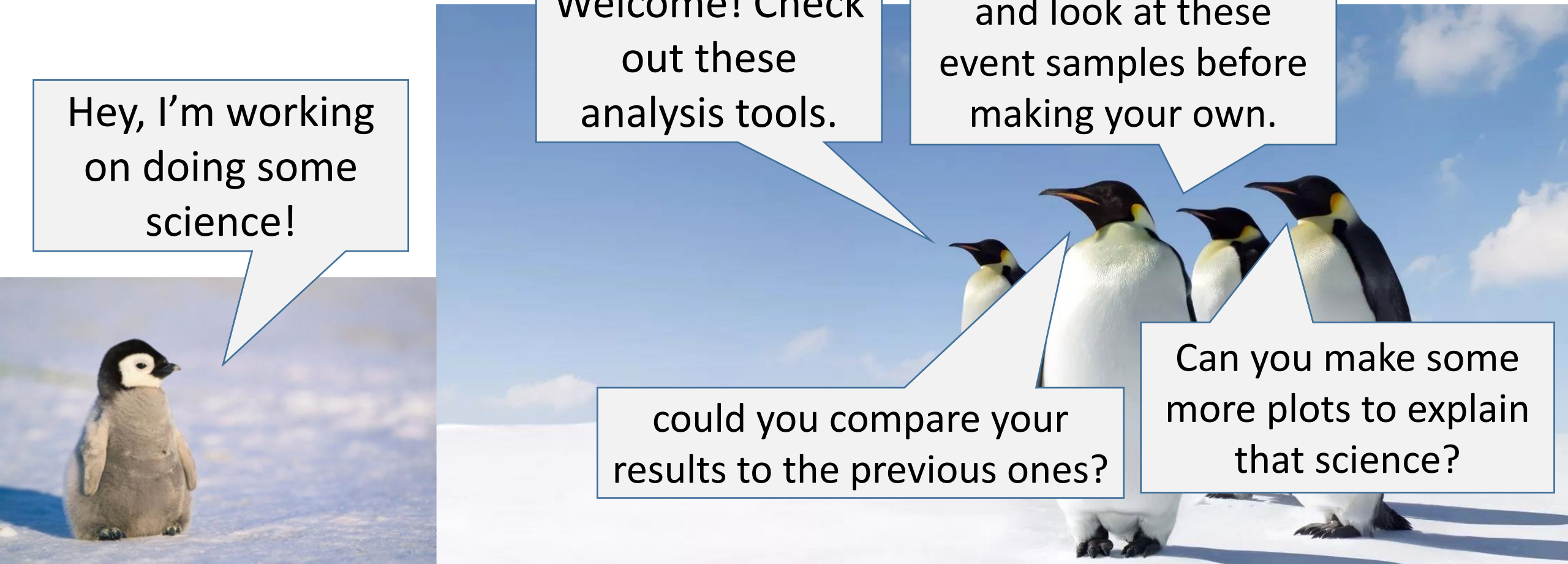
IceCube Working Groups

Bootcamp 2018

Sam Fahey

What are IceCube working groups?

- A group of IceCubers who share knowledge/interest in a particular type of IceCube science and its methods and complications



IceCube working groups

Technical working groups

- Calibration
- Simulation
- Reconstruction and Systematics
- Realtime

Physics working groups

- Beyond the Standard Model
- Cosmic rays
- Diffuse/Atmospheric neutrinos
- Neutrino Oscillations
- Neutrino Sources
- Supernova


Slack channel for informal discussion and questions

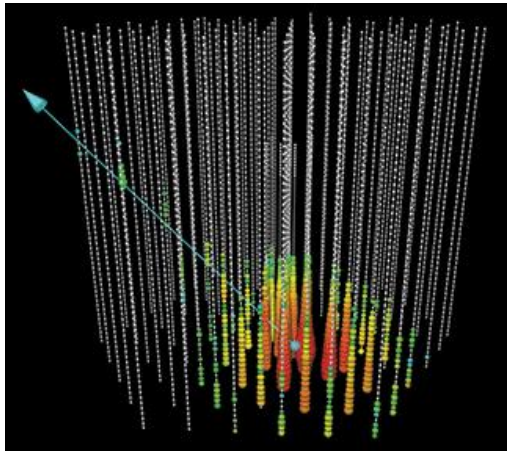

mailing list for announcements and documented public discussion

scheduled phone calls with presentations from members

dedicated sessions at collaboration meetings

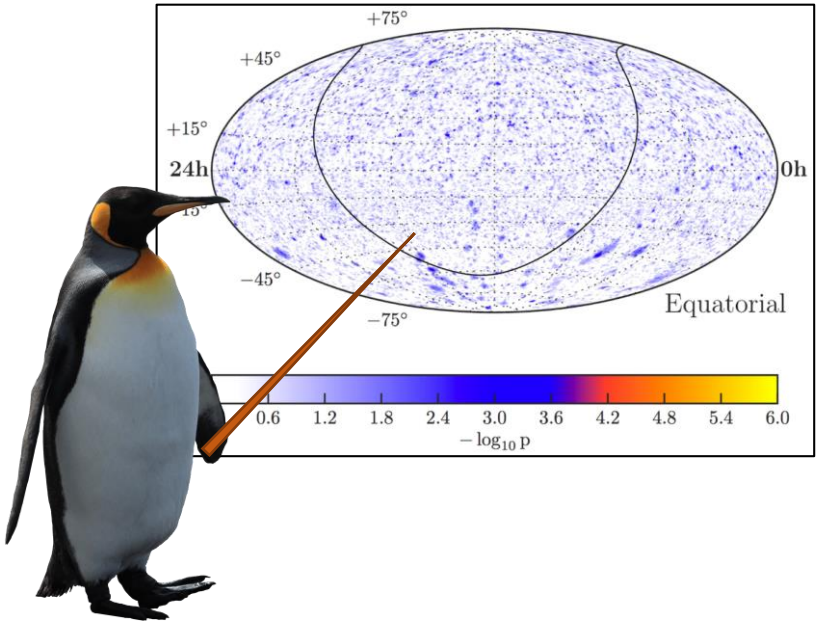
Technical working groups

- Calibration
  - LED flasher analysis, ice anisotropy measurements, DOM efficiency and noise modeling
- Simulation
  - produces simulation samples for calibration and analysis
  - Cosmic rays and muons: CORSIKA, MuonGun
  - Neutrinos: NuGen, Genie
- Reconstruction and Systematics
  - new group from merger of Cascades/Taus WG and Muons WG
  - developing/improving energy and directional reconstructions
- Realtime
  - manage IceCube alerts and MOUs with other observatories
  - advise and approve IceCube fast response searches



Physics working groups

- Beyond the Standard Model
  - dark matter, magnetic monopoles, Lorentz symmetry violation
- Cosmic rays
  - IceTop maintenance, anisotropy, mass composition, seasonal variation and gamma-rays
- Diffuse/Atmospheric neutrinos
  - measure astrophysical and atmospheric neutrino flux, tau searches, high purity samples



- Neutrino oscillations
  - GeV/DeepCore reconstructions, sterile neutrinos, NuMu dissappearance
- Neutrino sources *(largest working group)*
  - identify correlation between IceCube's events and astrophysical objects
- Supernova
  - SNDAQ, lowest-energy analyses study time correlation in detector noise rate

Neutrino Sources

#nu-sources

☆ | 80 | 3 | It's like the German reunification, PS being west Germany - a wise man from transients WG

- WG Leaders: Ignacio Taboada (Prof. at GATech) and Naoko Kurahashi Neilson (Prof. at Drexel)
- Weekly calls: Monday 9:30am CDT
- Point Source (PS) analyses
  - correlation of neutrino events with steady sources or significant clustering of event directions on sky
  - examples: Blazars, pulsar wind nebulae
- Transient analyses
  - include timing information in search for correlation with transient events and source classes
  - examples: gamma-ray bursts, fast radio bursts, gravitational waves, tidal disruption events, novae
- https://wiki.icecube.wisc.edu/index.php/Neutrino_Sources

THE ASTROPHYSICAL JOURNAL

All-sky Search for Time-integrated Neutrino Emission from Astrophysical Sources with 7 yr of IceCube Data

M. G. Aartsen[1], K. Abraham[2], M. Ackermann[3], J. Adams[4], J. A. Aguilar[5], M. Ahlers[6], M. Ahrens[7], D. Altmann[8], K. Andeen[9], T. Anderson[10] +Show full author list

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The Astrophysical Journal, Volume 835, Number 2

Extending the Search for Muon Neutrinos Coincident with Gamma-Ray Bursts in IceCube Data

M. G. Aartsen[1], M. Ackermann[2], J. Adams[3], J. A. Aguilar[4], M. Ahlers[5], M. Ahrens[6], I. Al Samarai[7], D. Altmann[8], K. Andeen[9], T. Anderson[10] +Show full author list

A Search for Neutrino Emission from Fast Radio Bursts with Six Years of IceCube Data

M. G. Aartsen[1], M. Ackermann[2], J. Adams[1], J. A. Aguilar[3], M. Ahlers[4], M. Ahrens[5], I. Al Samarai[6], D. Altmann[7], K. Andeen[8], T. Anderson[9] +Show full author list

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So you're working on an analysis...