## Cosmic Frontier Experiment Status
Feb 8, 2016

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<tr>
<th>Experiment</th>
<th>Location</th>
<th>Status</th>
<th>Start of operations</th>
<th>Nominal end of operations</th>
<th>Physics</th>
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<td>Sep 2015</td>
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<td>SNOLAB</td>
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SuperCDMS Soudan Decommissioning

• Decommissioning began in December and will continue through summer 2016
  – Still learning while taking things apart
    • Assay of backgrounds on detectors, cryostat and shielding
    • Better understanding of vibration
    • Final measurements of thermal performance, especially joint conductance
  – All of these are important for SuperCDMS SNOLAB
SuperCDMS SNOLAB Operations

• Incorporating “lessons learned” from Soudan
  – Develop and validate thermal and background modeling
  – Test cryogenics before going underground
  – Understand detector performance and backgrounds before the experiment starts
    • Planning underway for NEXUS (Northwestern Experimental Underground Setup), a dilution refrigerator testing facility at NUMI

• Fabrication and testing 2017-2019; operations 2020-2025
PICO-2L

• Run 2 ended
• Paper posted to arXiv: 1601.03729
• Rate consistent with the known neutron field
  • 1 event in 66 livedays
• The changes made were intended to reduce quartz particulate.
• Key: NO unknown background
PICO-60

• Engineering run is now in progress
  • Cycling a chamber filled entirely with water

• Training new collaborators on procedures

• Testing out
  • Equipment that has lain idle for almost two years
  • New chiller for our water tank
  • New 4-camera DAQ
  • New filtration system that is now in situ in the bubble chamber

• The new low radioactivity jar arrived last week

• Hoping to fill with C3F8 in the spring
DarkSide-50 Status

- **Running with underground Ar**
  - Uptime since Nov 1st: 83% (79.4 days)
  - DM search livetime since Nov 1st: 58% (55.4 days)
  - 2 week campaign with AmC (neutron) source
  - 3 planned standard PMTs HV off
  - 2 times one PMT had high dark noise rate so HV off
  - DAQ maintenance work
January 2016 – February 2016

• Towards DAMIC100 -
  • Production: packaging 4k x 4k = 16 Mpix CCD
  • Package and test rate: two sensors per week
  • 12 sensors are already ready for deployment
  • 18 CCDs is the goal, will be reached during February
  • On-line system implemented for tracking the sensors

• DAMIC@Snolab
  • Taking science-grade data. Using low gain to extend the dynamic range to measure the energy of alpha decays.

**Status:** taking data with prototype detectors. Uptime >95%. High quality data.
Dark Energy Survey

- Y3 Observing will be complete, Feb 12, 2016
  - Weather strongly affected Y3 data acquisition
- Re-processing of images with upgraded pipeline will soon be underway
- First dark energy results using Y1-Y3 data likely to appear by Summer 2017.
- To date, >50 papers discussing processing and analysis pipelines.
- We are also searching for more evidence of the recently reported Planet 9

![Graph showing accumulated hours from 2014-01 to 2016-01 with baseline and achieved lines.](chart.png)
Holometer

- Increased data by a factor of 4.5:
  - From 150 hours in the previously reported analysis to 700 cumulative hours

- Current plan:
  - End the run and analyze the data during the next month.