Non-Accelerator Capabilities

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Scope

- The primary focus of the Non-accelerator Facilities working groups will be on underground facilities.
- If non-accelerator capability areas other than underground facilities are addressed, they will be handled by other working groups e.g. Cosmic Frontier or Intensity Frontier.

Working Groups

- NAF1 – on underground facilities to support very large detectors for neutrino physics, proton decay and other science requiring detectors of the multi-kiloton scale.
  - NAF1 conveners: K. Heeger (Wisconsin), K. Scholberg (Duke), H. Sobel (Irvine)
- NAF2 – on underground facilities for dark matter experiments, neutrinoless double beta decay experiments, underground accelerators for nuclear astrophysics or other physics, low background assay of materials and related topics.
  - NAF2 conveners: P. Cushman (Minnesota), J. Klein (Pennsylvania), M. Witherell (Santa Barbara)
- Underground facilities in support of instrumentation development in both working groups
  - Convener, contact with Instrumentation: M. Gilchriese (LBNL)

General Charge

1. Assess the status and potential plans for underground facilities worldwide, with particular attention to the current and planned role of U.S. scientists;
2. Answer the following question in conjunction with the relevant Cosmic Frontier, Intensity Frontier and Instrumentation Frontier working groups – how will the existing or planned underground facilities meet the needs of US scientists and their scientific goals over the next 10 – 15 years (to about 2025)?
3. Address future U.S. organizational aspects for underground facilities

Connection to Cosmic Frontier (CF1)

- Direct dark matter (WIMP) experiments
- What are the underground facilities for the near-term (roughly the next 5 years) potential experimental program in WIMP direct dark matter detection?
- Assuming experiments ("G3") beyond the next generation, what are the facility requirements (number of experiments, size of experiments, depth, etc) for
  - Continued search/direct detection.
  - Is there a limiting case? (Most demanding facility)
  - How do the facility requirements depend on detection technology?
  - For large directional experiments?
- Experiment roadmap(s) => facility roadmap(s)
- Worldwide, but identify U.S. aspects/roles

Connection to Intensity Frontier

- Underground facilities over about next 5 years and long-range plan up to ~ 2025. Worldwide look.
- Neutrinoless double beta decay
  - In U.S., nuclear physics steward, need to reach out to interact with this community, not well represented at this CPM
- "Non-accelerator" neutrinos
  - In part also U.S. nuclear physics effort
  - Very diverse (solar, atmospheric, reactor, supernova….)
- "Accelerator" neutrinos
  - Long range plan in U.S. inextricably linked with LBNE
  - Will LBNE be underground or not? Unlikely to know by time of CSS in 2013. Phased approach beyond ~ 2025.
- Need more interaction with IF to develop roadmap(s)

Planning

- In process of obtaining from all underground labs (and experiments as needed)
  - Status
  - Possible future plans, roadmap, etc
  - Current involvement of U.S. scientists
  - Potential future involvement of U.S. scientists
  - Roadmap(s)
- Will compile presentations summarizing this information (check with labs)
- Present to representatives from CF, IF and Instrumentation….this is what we think is the status of and the plans for underground facilities……iterate
- Aiming to have initial overall summary at presentation level by March meeting at SLAC.

	Facility Location	Convener Contact(s)	
United States			
	Kimbalton	Klein	
	Soudan	Cushman	
	SURF	Gilchriese	
	Washington	Sobel	
	WIPP	Sobel	
Canada			
	Snolab	Klein	
Europe			
	Boulby	Klein	
	Canfranc	Sobel	
	Gran Sasso	Scholberg	Witherell
	Modane	Cushman	
	Pyhasalmi	Scholberg	
Russia			
	Baksan	Sobel	
Japan			
	Kamioka/other	Scholberg	Sobel
China			
	Jinping	Heeger	
	Daya Bay/ II	Heeger	
Korea			
	Y2L	Gilchriese	
	RENO/ II	Heeger	
India			
	INO	Scholberg	
South America			
	ANDES	Scholberg	
Antarctica			
	IceCube (+ extensions)	Heeger	