

Cosmic Frontier 1: Wimp Direct Dark Matter

CHARGE

- (1) Summarize the state of direct searches for dark matter. **Working Group A**
- (2) Review the motivation for future generations of direct searches for WIMP dark matter
- (3) Develop criteria and figures of merit by which future generations of direct dark matter search experiments can be evaluated in terms of sensitivity and discovery potential

- (4) Craft a vision for the suite of future dark matter search experiments needed, which cover the parameter space described by our benchmark models. **Working Group B**
- (5) Review the impact of direct searches for dark matter on our knowledge of the generic properties of dark matter.

- (6) Identify infrastructure common to direct dark matter searches and explore strategies to deliver it. **Working Group C**

The Deliverable is a set of documents summarizing the Findings defined in Charge(s)

Nested Set of Papers

CEO Executive summary (above our pay grade)

VP Summary (Steve and Jonathan get to compare and contrast CF1-CF6)

We are responsible for **the Junior manager** summary (WIMP Direct Detection)

The Charges define the Outline of this White Paper

Compendium of **Supporting Documents**

Initially by experiment, on the Snowmass Wiki

But we are not in a vacuum.

Start with CF1 details & help with the C4 complementarity

Interface with C2-6 once we have a good start on our drafts

Purpose of the Snowmass Process for CF1 is to

Make the Science Case for WIMP Direct Detection

As such, we need to cover/define the parameter space we span now and in the future

Cannot be done without a full understanding of the reach of the experiments we are currently performing and those we can predict to exist over the next 20-30 years.

Thus we will spend the next few days learning about each other's experiments

Long process – this is just the start. What is missing still? Gather more information

Schedule on Indico. **Talks (RED) uploaded to Indico**. Link to the Indico talk should be on your Snowmass experiment wiki, as well as any supporting information and links.

<http://www.snowmass2013.org/tiki-index.php?page=SLAC>

Wed Afternoon

High purity crystal (incl. annual modulation) **KIMS, Princeton NaI, DM-Ice**
DAMA/LIBRA, ELEGANT, ANAIS, CINDMS, Tokyo(Li/NaF).

Thurs Morning 1

Threshold Detectors: **PICASSO, COUPP**, SIMPLE

Directional Detection: **DRIFT, New age, D3, DMTPC**, MIMAC

Thurs Morning 2

Cryogenic solid state: **CoGeNT, TEXONO/CDEX**, SuperCDMS, EURECA

Thurs Afternoon 1

Noble Liquids: **LUX/LZ, XENON, PandaX, DarkSide, DEAP3600**, miniCLEAN, XMASS, ArDM

Thurs Afternoon 2

New directions: **DAMIC, Liquid-He4, NEXT, nuclear emulsion, DNA**

Friday Morning

- A. Underground Facilities, Assay Integration, Large neutrino/Astrophysics/Proton Decay
- B. Discussion on Way Forward for CF1 and Preparation of summary slides

Long term Working Group Schedule

March

Organize the Information gathered during this workshop

Use this time to take notes, prepare clarifying questions, etc.

Break down into manageable tasks

April-May

Outline the White Paper(s) based on the charges

Refine the charges as needed and find the gaps/overlaps

Begin writing drafts

By June

Rough Drafts to be circulated to the rest of Cosmic Frontier

Major realignment possible, depending on interface with other CF groups

June-July

Incorporate benchmark dark matter points developed by CF4 and Group B.

Rewrite and expand drafts

By August

First draft should be done.

Get to know your wiki

<http://www.snowmass2013.org/tiki-index.php?page=Cosmic%20Frontier>