

# Snowmass2013

## Status Report

LCWS12 (October 22, 2012)

Pierre Ramond (U. Florida)  
Chair, Division of Particles & Fields



# Brought by the DPF Executive Committee

Jonathan Rosner (U Chicago) Chair-Elect

Ian Shipsey (Purdue) Vice-Chair

Patricia McBride (Fermilab) Past Chair

Alice Bean (Kansas) Treasurer

Marjorie Corcoran (Rice)

Jonathan Feng (UC Irvine)

Kara Hoffman (Maryland)

Yuri Gershtein (Rutgers)

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## Snowmass2013 has begun!

# Snowmass2013 Charge to Conveners

The American Physical Society's Division of Particles and Fields is initiating a long-term planning exercise for the high-energy physics community.

Its goal is to develop the community's long-term physics aspirations.

Its narrative will communicate the opportunities for discovery in high-energy physics to the broader scientific community and to the government.

originally anchored by two major meetings

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July 29–August 6, 2013, University of Minnesota

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## **CSS2013: Community Summer Study Meeting**

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**“Snowmass on the Mississippi”**





CPM2012 presentations can be found at

<http://www.snowmass2013.org>

### Groups

All  
Energy Frontier  
Intensity Frontier  
Cosmic Frontier  
Frontier Capabilities  
Instrumentation  
Frontier  
Computing Frontier  
Education and  
Outreach

### Google Search



snowmass2013.org

WWW

## Snowmass 2013 process

**Community Planning Meeting 2012** (FNAL, October 11-13 2012)



**Community Summer Study 2013 (Minneapolis, 7/29 - 8/6 2013) ("Snowmass on the Mississippi")**

# Focus areas & conveners

**Energy Frontier:** Raymond Brock (Michigan State), [brock@pa.msu.edu](mailto:brock@pa.msu.edu),  
Michael Peskin (SLAC), [mpeskin@slac.stanford.edu](mailto:mpeskin@slac.stanford.edu)

**Intensity Frontier:** JoAnne Hewett (SLAC), [hewett@slac.stanford.edu](mailto:hewett@slac.stanford.edu),  
Harry Weerts (ANL), [weerts@anl.gov](mailto:weerts@anl.gov)

**Cosmic Frontier:** Jonathan Feng (UC Irvine), [jlf@feng.ps.uci.edu](mailto:jlf@feng.ps.uci.edu),  
Steve Ritz (UC Santa Cruz), [ritz@scipp.ucsc.edu](mailto:ritz@scipp.ucsc.edu)

**Instrumentation:** Marcel Demarteau (ANL), [demarteau@anl.gov](mailto:demarteau@anl.gov),  
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Ron Lipton (FNAL), [lipton@fnal.gov](mailto:lipton@fnal.gov)

**Frontier Capabilities:** William Barletta (MIT), [barletta@mit.edu](mailto:barletta@mit.edu),  
Murdock Gilchriese (LBNL), [mggilchriese@lbl.gov](mailto:mggilchriese@lbl.gov)

**Computing Frontier:** Lothar Bauerdick (Fermilab), [bauerdick@fnal.gov](mailto:bauerdick@fnal.gov)  
Steven Gottlieb (Indiana), [sg@indiana.edu](mailto:sg@indiana.edu)

**Education and Outreach:** Marge Bardeen (FNAL), [mbardeen@fnal.gov](mailto:mbardeen@fnal.gov),  
Dan Cronin-Hennessy (UMn), [hennessy@physics.umn.edu](mailto:hennessy@physics.umn.edu)

**Special Advisor:** Chris Quigg (FNAL), [quigg@fnal.gov](mailto:quigg@fnal.gov)



# Energy Frontier

## Interim Meetings (tentative)

- April 4–6, 2013 Midwest General Meeting, initiation of projects
- June 6–8, 2013 KITP Theory Meeting
- July 10–12, East Coast General Meeting

## Working Groups

The Higgs Boson

Precision Study of Electroweak Interactions

Fully understanding the top quark

The Path beyond the Standard Model, new particles, forces and dimensions

Quantum Chromodynamics and the Strong Interactions

Flavor Physics and CP violations at High Energies



# Intensity Frontier

## Interim Meetings (tentative)

- early March, SLAC, on neutrinos
- one-day meeting, charged lepton group
- May/June, General meeting

## Working Groups

Quark Flavor Physics

Charged Lepton Processes

Neutrinos

Baryon number violation

New light weakly coupled particles

Nucleons, nuclei & atoms



# Cosmic Frontier

## Interim Meetings (tentative)

- Jan 28-Feb 2, Aspen, Dark Matter Complementarity
- March 5-8, SLAC, with Capabilities Frontier, DURA
- March 22-25, Snowbird, Non-WIMP dark matter
- May 13-17, KITP Multiple Probes of dark matter

## Working Groups

Direct Detection of WIMP dark matter  
Indirect Detection of WIMP dark matter  
Non-WIMP dark matter  
Dark matter complementarity  
Dark energy and CMB  
Cosmic Particles and Spacetime Physics



# Instrumentation Frontier

## Interim Meetings (tentative)

- Jan 9-11, ANL, CPAD Meeting
- April 17-19, Boulder, CPAD Meeting

## Working Groups

Sensors

Gaseous detectors

Detector Systems

Electronics/DAQ/Trigger

Novel Emerging Technologies

Software



# Capabilities Frontier (accelerators)

## Interim Meetings (tentative)

- Jan 14-24 (3 days), Duke/UT Austin, accelerator technology
- Feb(1.5 days), Old Dominion, Intense photon beams
- Feb (2.5 days), U Hawaii, high intensity electron beams
- Feb UCSC, high energy lepton colliders
- March, MIT, high energy hadron colliders
- April, Stony Brook, high intensity proton beams

## Working Groups

Energy frontier hadron colliders

Energy frontier lepton & photon colliders

High intensity proton beams

High intensity electron & photon beams

Electron-ion colliders

Technology test-beds & test beams



# Capabilities Frontier (non-accelerators)

## Interim Meetings (tentative)

- Jan 9-11, ANL, CPAD, underground facility needs
- March 5-8, SLAC, with DURA & Cosmic frontier
- May?, with Intensity Frontier

## Working Groups

Underground facilities with kiloton detectors

Underground facilities for dark matter experiments,  
neutrinoless double beta decay, etc...





# Computing Frontier

## Interim Meetings (tentative)

- Nov 28 (half day), DC, with NERSC workshop
- Piggyback on Energy, Intensity, and Cosmic frontiers meetings

## Working Groups

### User-needs subgroups

Cosmic Frontier  
Energy Frontier  
Intensity Frontier  
Accelerator Science  
Astrophysics & Cosmology  
Lattice Field Theory  
Perturbative QCD

### Infrastructure subgroups

Computing, including special purpose hardware  
Distributed Computing and Facility Infrastructures  
Networking  
Software Development, Personnel, Training  
Data Management and Storage



# Education & Outreach

## Interim Meetings (tentative)

- March 16–17, Baltimore (APS) Teachers and Students
- April 12–13, Denver (APS) Community, Policy Makers

## Working Groups

The General Public

Policy Makers and Opinion Leaders

The Science Community

Teachers

Students

## Charge cont'd

### "Snowmass on the Mississippi" ...

... will provide an opportunity for discussion, analysis, and will arrive at conclusions for each area of the study.

By the end of this meeting, each set of conveners will have prepared an executive summary for their area, and overlap areas if necessary. Each subgroup will produce a report answering its charge and summarizing the discussion of its area throughout the process.

The ensuing electronic record, which may also contain contributed papers, will be an important resource for the community.

**We anticipate that this long-term planning process will trigger an independent process of review and prioritization solicited by the funding agencies.**

# DOE's Perspective:

In 2008 HEPAP through the work of its P5 subpanel laid out a compelling strategic vision for the future of High Energy Physics.

Given recent exciting results at all the HEP scientific frontiers, and the ongoing evolution of budget projections and project plans, it is prudent to revisit the HEPAP/P5 plan with an eye towards examining the science options that have been put forward as well as emerging opportunities.

As a first step in this process, we need a strong scientific case that covers the range of opinion in the community. We would like to understand if our opportunities enable programs that are capable of achieving most or all of the scientific goals as the program considered in the 2008 roadmap, or whether some modifications to those goals and plans are needed.

To that end, a planning process that carefully considers the science opportunities and trade-offs involved, and can clearly elucidate the pros and cons of the various options, would be extremely valuable input for updating the HEP strategic plan.

Jim Siegrist,  
Associate Director, Office of High Energy Physics  
Office of Science, U.S. Department of Energy

**DOE will initiate a P5 subpanel at the  
conclusion of Snowmass2013**

Get involved!

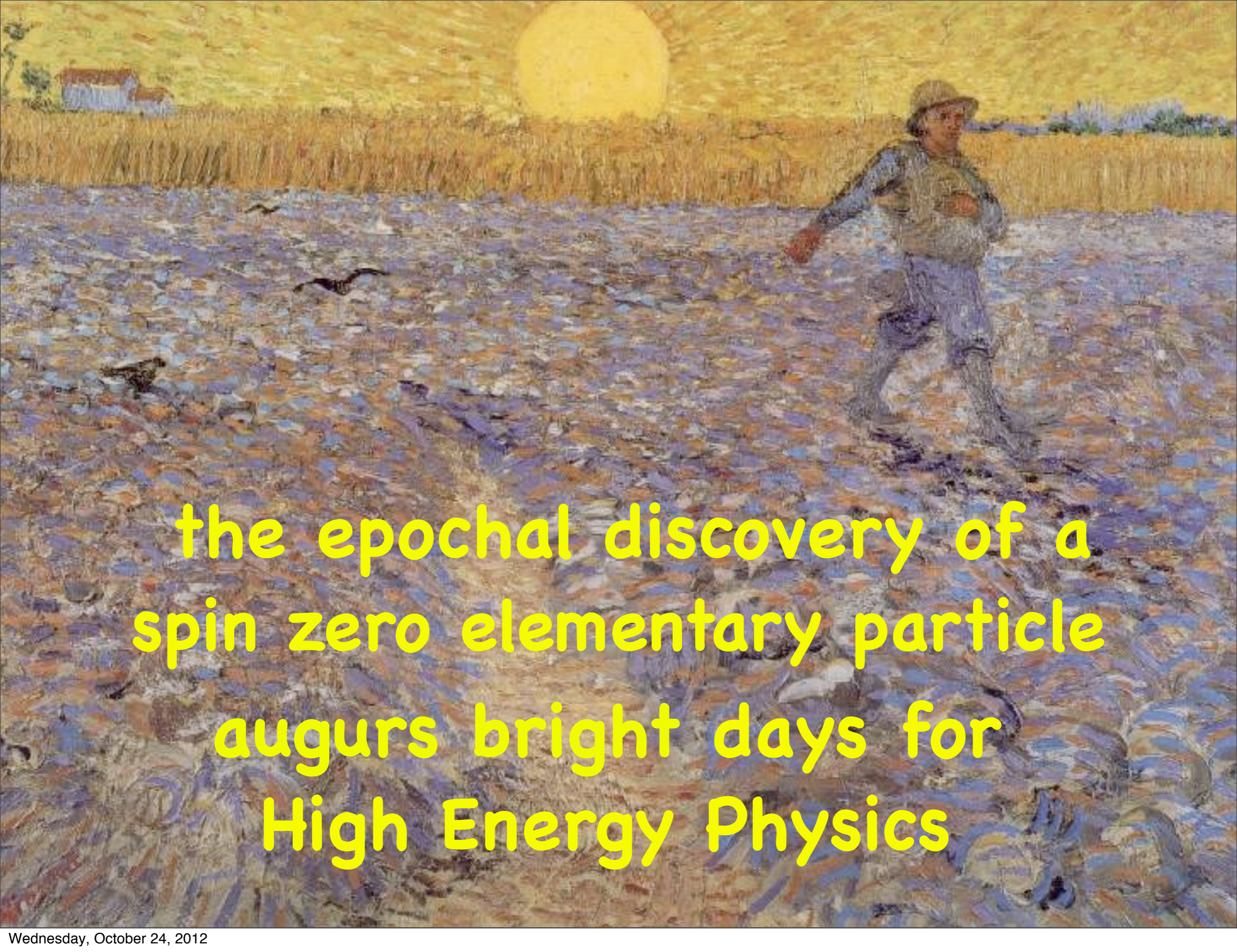
Volunteer your time & expertise

White papers welcome









the epochal discovery of a  
spin zero elementary particle  
augurs bright days for  
High Energy Physics