

Holometer

Participants, Costs, Schedule

Obviously we are in an R&D phase working towards a proposal, but hopefully this presentation gives an idea of the scope of our initiative.

W. Wester

Fermilab Center for Particle Astrophysics

Participants

- Craig Hogan – evil genius
 - Has engaged members of gravity wave community
 - GEO600 – mystery noise
 - LIGO – experts
- GammeV team
 - Already in place for small scale optics/laser projects for future axion work
- Others in the Fermilab Center for Particle Astrophysics
 - Some looking for new, interesting initiatives
 - Some experts in helping get things done at the lab

Scientific effort (Draft EOI)

C. Hogan 30%

Project Scientist

Director, Fermilab Center for Particle Astrophysics

Fermilab MS 127

PO Box 500

Batavia IL 60510

S. Whitcomb 10%

California Institute of Technology

A. Chou, J. Steffen, E. Ramberg, C. Stoughton, R. Tomlin, W. Wester

50%

20%

20%

50%

20%

25%

Stephan Meyer 30%

University of Chicago

10% **Sam Waldman, Rainer Weiss** 20%

Massachusetts Institute of Technology

Dick Gustafson 20%

University of Michigan

Total: 3 FTE/yr

Engineering/Technical effort

- Initial R&D phase
 - Very little electrical/mechanical engineering for on-going optical cavity/interferometer R&D
 - Continue site studies and infrastructure
 - FESS engineering (FCPA funds)
 - Seismic and other studies (minimal AD effort)
- Mechanical engineering
 - Borrow much from LIGO experience
 - Vacuum vendor can provide associated design engineering
 - We will have to design supports for vacuum tubes etc.
- Electrical engineering
 - Again, borrow much from LIGO optics experience
 - Much is accomplished with stand-alone boxes
 - Perhaps some small printed circuit boards needed for critical amplifiers, etc.
- Technical assistance required for installation activities.

M&S Costs

- Driven by the site and infrastructure (see Erik's talk)
 - Building, clean rooms, temporary walls, etc.
- Optics (\$300K)
 - LIGO experience applies directly (\$181K)
 - Procurement specialist confirms pricing (+10% or ~+19K)
 - Mirror supports and feedback control (\$100K est)
 - Overlap with axion R&D means some costs shared
- Mechanical
 - Mirror supports and feedback control (\$100K est)
- Electronics (\$200K)
 - 10 boxes at \$5K each, + \$50K each for digital correlater, DAQ/computers, and cables/connectors etc.
 - Again, some costs shared with axion R&D
 - Proposal for electronics, noise isolation R&D centered at Univ of Chicago (Steve Meyer + Aaron Chou).
- Vacuum (\$132K)
 - Tubing itself (6400 inches at \$5/inch) is \$32K (budgetary quote)
 - Estimate \$100K for flanges, vessels for optics tables

Schedule

Current draft EOI shows:

- Year 0: R&D leading towards proposal
- Year 1: Installation and commissioning
- Year 2: Measurement
- Year 3: Contingency and decommissioning