Education and Outreach

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Education and Outreach Outline:
Investing in America’s Future

- Observatory Education & Public Outreach
  - Public and school visits to/from observatories
  - Teacher professional development
  - Includes national outreach component

- Summer undergraduate research program
  - Real science exposure for STEM college students

- Visitors program
  - Provides connections to science and education communities
Observatories are special opportunities for education

- Technical requirement to situate sophisticated science in rural areas, which happen to have large under-served populations (~45% of K-12 visitors)
- An emphasis with founding leadership, but a number of technical hurdles needed to be overcome
- Under the current operations cooperative agreement the core of a very successful program has been built
- In this proposal we request increased funding to strengthen and continue to grow the program
LIGO outreach programs at Observatories connect the public to LIGO science

LIGO outreach uses the excitement, grandeur and intimacy of the Observatory sites to promote science interest and science literacy among all ages. Local Educator Networks offer guidance for outreach development.
Major local outreach components include field trips, on-site public events, off-site activities and teacher professional development programs. Outreach activities engage the ethnically diverse populations that surround the Observatories.
Livingston Science Education Center

- Flagship facility for LIGO EPO
- 9000 ft² adjacent to auditorium
- 5000 ft² of exhibit hall space with more than 40 exhibits
- Exhibit and classroom activities
- Programs for
  » K-12 visits
  » Teacher Professional Development
  » Public/family outreach
- Winner of AIA New Orleans 2007 Design Award
LIGO Science Education Center illustrates the power of partnerships

Docents in Training from Southern University Education Program

LA GEAR UP provides access to low performing schools

Exploratorium Exhibits & Training
What a science education center means to rural America

- Most children in Louisiana have never met a scientist or an adult who holds a high-tech job.
- Many have never seen a place of business other than a store or (perhaps) a chemical or agricultural plant.
- In our control room, they meet an operator, a staff scientist or engineer, and perhaps visiting scientists, who tell them about LIGO and how one becomes a scientist.
- The kids step right up to the control room desk and computers and there are almost never any behavior issues; the kids know that this is the real deal, and they pay attention.
- Seeing an impressive science facility in their back yard, they can begin to think of science and engineering as part of their future, something that their neighbors do.
- We tell them to study math and science, and we hope that the programs and exhibits also nudge them in that direction.
Total Visitor Days: 4940
students = 60%
teachers = 31%
adults = 9%

SEC Attendance 1st Year

- Teachers: 31%
- Elementary: 20%
- Middle School: 26%
- HS students: 14%
- Adults: 9%

Total Visitor Days: 4940
students = 60%
teachers = 31%
adults = 9%
Propose to increase LIGO Science Education Center operations funding by $323K/yr (direct FY07$) to:

- **Make full use of facility** - maximizing benefit to the region;
- **Hire another educator**; current facility use saturates current staffing
- **Increase outreach to Student visitors**; SEC now offers 3 student field trips per week plus teacher workshops on Saturdays; increasing staff will permit full utilization of the SEC facility to 5 field trip visits per week.
- **Increase the number of teacher training programs we can offer**; it takes a lot of time and effort to produce activities for teacher training
- **Exhibits will require increased maintenance**; aging exhibits and increased use equate to more maintenance
LIGO Hanford programs also rely on partnerships to fuel growth.

LHO outreach received state and local awards in 2007.
Hanford Observatory outreach attendance

2006-07 LHO Visitor Count, Person-Days

Total LHO Person-Days = 3676

- K-12, 1230, 34%
- Public, 1561, 43%
- College, 348, 9%
- Educators, 269, 7%
- Professional, 268, 7%

Additional off-site activities served 4300 in the same time period.
Opportunity for strong growth in audience served

Audience could increase 2-3X by end of next ops period, but will begin to saturate without increased manpower.
National outreach handled principally by Hanford

I2U2 (PHY 0636265 - Fermilab): Putting LIGO environmental data into the hands of students and teachers via the Web and the Grid

Einstein’s Messengers: Teacher support materials

Einstein@Home: An international user community
Propose to increase Hanford EPO budget by $177K/yr (direct FY07$) to:

- Add 2nd educator and provide part-time administrative support to prevent saturation of number of people served and increase teacher training capacity
- Maintain national outreach products (principally software and teacher PD associated with I2U2 eLab)
- Update and expand exhibits and curricular materials to maintain interest and address new audiences
Observatory education & public outreach program summary

• Proposal consolidates and expands program quality, maintains existing infrastructure and strengthens staffing to propel future growth and serve a greater audience.

• Total costs (including proposed increases): $413K/yr, totaling $2.1M (FY07$ direct) + 6 FTEs/yr
Summer Undergraduate Interns

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Propose funding for ~22 students/year totaling $0.86M + 6/yr on MIT subcontract totaling $0.24M

($ given are direct costs in FY07 dollars)
LIGO Visitor Program

- **Three goals**
  - Provide visitors opportunity to learn about LIGO and develop science/education programs around LIGO
  - Foster collaborative arrangements which further the science/education mission of LIGO
  - Provide access by broader science/education communities to LIGO resources
- Includes both short-term and long-term visits by researchers, educators and students and travel by Lab staff to other institutions for collaborative visits
- Initially funded by separate grant + some operating funds
- Propose to continue with ~18% increase in spending level: $460K/yr, totaling $2.3M in direct FY07$
- Increase provides for:
  - more extended visits between LIGO and Virgo
  - greater presence at sites from LSC and Virgo students and postdocs
  - increasing emphasis on educational collaborators
Summary

- Proposal consolidates successful EPO programs, developed using funding from prior operations and start-up grants
- Observatories, located in rural areas with special needs and under-served/represented cultural groups, provide unique opportunities for growth
- National effort seeks broad presence in homes and classrooms
- REU and visitor programs offer growth opportunities for this new field
- Invite panel members to further explore education and outreach issues in parallel session tomorrow