

A Multi-Partner Summer STEM Career Academy for High School Seniors

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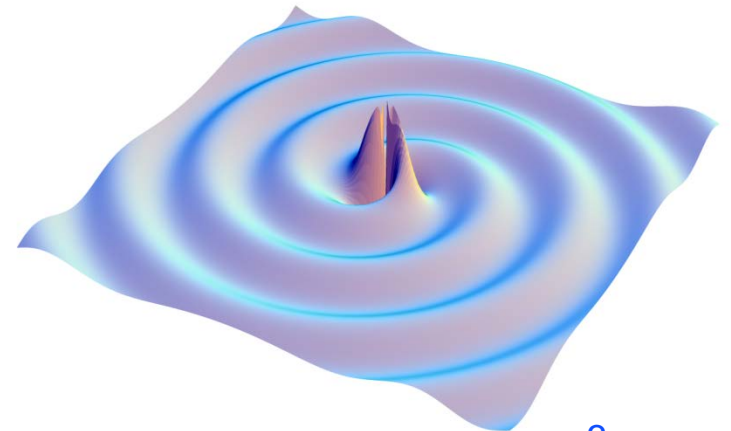
Today's Session

- LIGO
- WSU GEAR UP
- LIGO + WSU GEAR UP
- The Summer Academy:
 - Justification and goals
 - Program architecture and responsibilities
 - Program partners
 - Logistics
 - The rollout
 - The challenges
 - Student feedback
- Acknowledgements



LIGO: Laser Interferometer Gravitational-wave Observatory

- Seeking to open a new field of astronomy through the direct detection of gravitational waves from outer space.
- Operating detector facilities in WA and LA; managed by Caltech and MIT for the National Science Foundation (NSF).
- An international collaboration of nearly 1000 researchers dedicated to the proposition that black holes are cool and we ought to try to understand them better.
- Deploying technology that sets global precision standards in lasers, optics, vibration isolation and control systems.



LIGO began science operations in 2002 after years of R&D, planning and construction



- Science mission: Open a new window on the universe through gravitational wave astronomy
- Education and outreach mission: Leverage the excitement of the science mission to engage students and teachers in authentic, enjoyable and challenging STEM experiences.

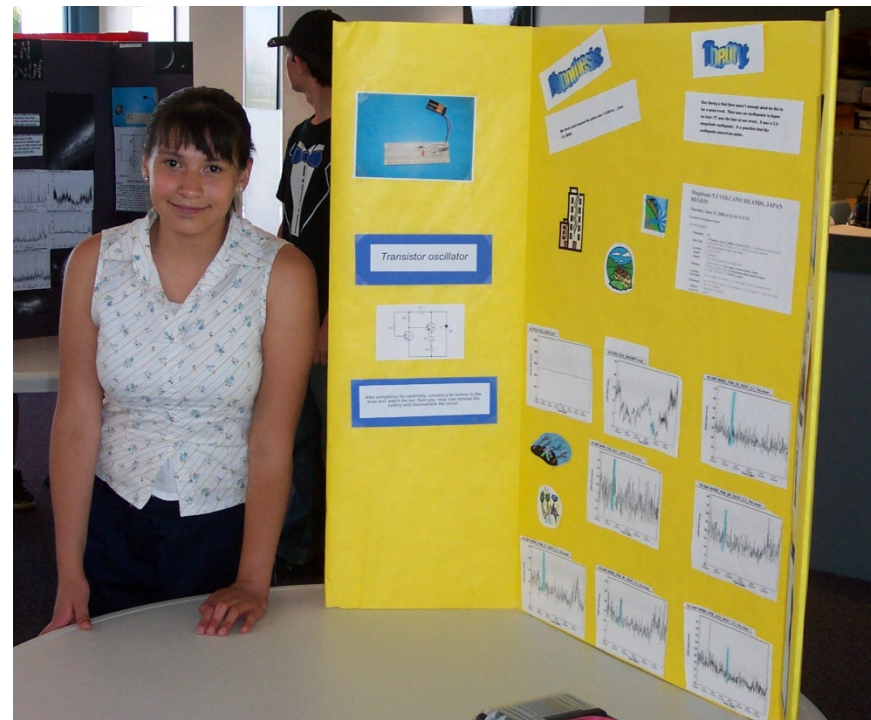
WSU GEAR UP



- WSU GEAR UP grants are administered by the office of WSU Early Outreach, located on the WSU Tri-Cities campus in Richland, WA.
- WSU GEAR UP grants serve school districts that cover a large portion of Southeastern WA in communities that in many cases are majority Hispanic.
- WSU Early Outreach owns a long history of GEAR UP work and a nine-year STEM partnership with LIGO Hanford.

WSU GEAR UP and LIGO

- Middle school visits to the observatory
- Summer science camps for middle schoolers
- Bilingual family events at the observatory
- Visits to school sites for hands-on science
- Participation in middle school campus orientation events at WSU TC
- Middle school career fairs
- A problem of long standing: How to position LIGO as an effective resource for high school GU efforts.



Chat

- What might be some of the reasons that LIGO has struggled to make itself useful to WSU GU at the high school level?



WSU GEAR UP proposes a 2014 Summer STEM Academy

- The partners' goal: To provide high school students with a high-interest no-fee summer STEM experience that will boost the students' STEM awareness, literacy and interest and will improve the students' understanding of STEM college and career pathways.
- Targeted participants: High school seniors coming from the underrepresented student populations in Pasco and nearby high schools that are served by WSU GEAR UP.
- What would success look like? "I learned about several science-related careers and I met professionals who are involved in these careers. I learned how I can prepare for these careers. I did activities that are similar to the activities that these professionals do, and I had fun."



Program Design

- Jointly: Agree upon the program strands and the overall program design.
- WSU GU: Provide financial support, recruit participants, arrange all logistics including permissions, transportation and lunches, provide staffing, secure campus space as needed.
- LIGO: Enlist additional community partners to lead the strands, make all the necessary arrangements with these content partners, oversee the delivery of program content, collect feedback from students.



- Alyssa Trevino-Carrillo
- Kiona Benton GEAR UP
- On special assignment from WSU GEAR UP to coordinate the summer academy
- atrevino@earlyoutreach.wsu.edu

Chat

- What do you think were the factors that led to the choice of content strands that became part of the summer academy?



Top-level Design

- Four strands: Health professions, agricultural science, technology (robotics), basic science research (physics and astronomy).
- Four content partners: Kadlec Regional Medical Center, WSU Irrigated Agricultural and Research Extension Center, Pasco School District and LIGO.
- Four days: Three days of content and a family celebration on the evening of day four.
- Leverage GEAR UP personnel at Pasco and Chiawana High for recruitment, permissions and staffing.



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Final Design

- The question “What should we do?” is determined by goals. The question “What can we do?” is shaped by a host of other factors that aren’t obligated to align well with the goals. In this case, the organizing partners largely were able to do what we felt we should do, thanks to good fortune, willing content partners and a major effort on the GEAR UP side to subdue the logistical challenges.



The Rollout



Chat

- What challenges/problems would you expect to encounter in this undertaking?



The Challenges

- We built it and they didn't come.
- Very expensive; cost efficiencies would most likely be needed if the effort were to move beyond a pilot project.
- A serious medical circumstance tested the partners' planning and preparation.
- The normal bumps occurred that one would expect in a first article test; these could get smoothed out in future iterations.
- Personnel changes have placed some uncertainty on plans for follow-up activities with this summer's students.



Student Feedback

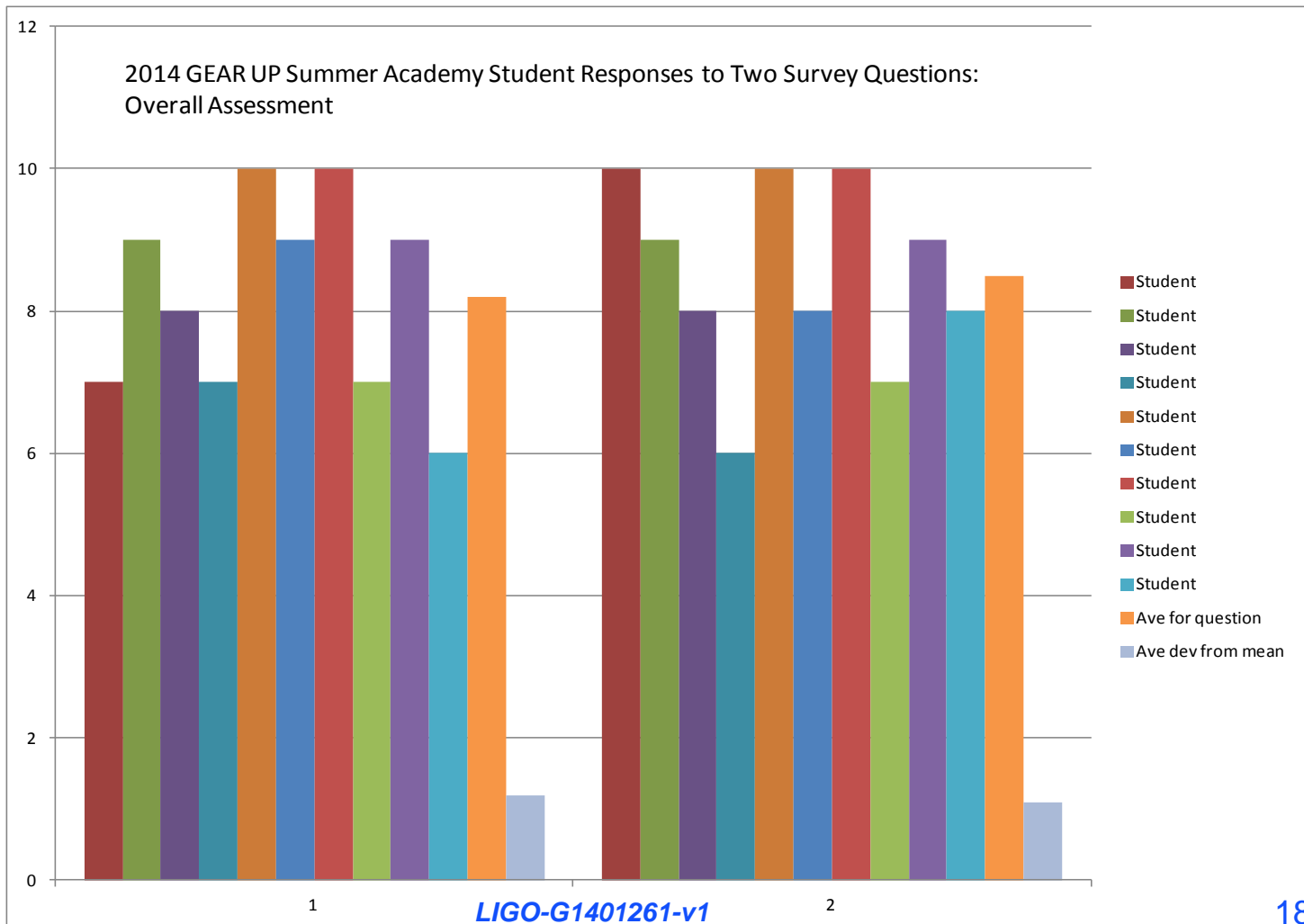
1. How familiar were you with the professions represented at yesterday's program?
 2. To what extent, if any, did your understanding of medical professions increase as a result of yesterday's program?
 3. How much did you learn from the presentations in yesterday's program?
 4. How much did you learn from the hands-on activities in yesterday's program?
 5. What is your current level of interest in the types of professions represented at yesterday's program?
- 10-point scale: 1 = none, 4 = some, 7 = quite a bit, 10 = a lot

Strand by Strand

- On average, the students felt like they knew a reasonable amount about health professions going into the Academy. They found the activities and presentations useful.
- The students knew less going in about ag science than health professions and the gain in their learning (Q2) was greater. Most indicated a lesser interest in ag science as a career, although two students indicated high interest.
- The students' prior knowledge of technology-intensive professions was quite variable. The learning gains were appreciable and all students felt that the learning from the hands-on component (which was most of the strand) was significant.
- The students varied widely in their incoming knowledge of science and engineering professions. Learning gains were significant. Several students showed gains in a comparison of question 1 to question 5, meaning that the strand may have had a positive impact on career interest.



- In an overall way, to what extent did your understanding of technical professions change this week, if at all? How much do you feel that you learned about the professions that were represented in this week's program?
- To what extent was this week's program a worthwhile personal experience for you?



From the written comments . . .

- “Hands-on activities are not only the most fun, but also seem to make us learn the most as well.”



Acknowledgements

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