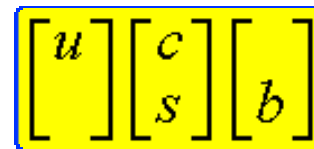


Thoughts on the DOE University Program in High Energy Physics

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Presentation to HEPAP Subpanel on the DOE University Grants Program in High Energy Physics
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Outline

- General comments about the University Program
- Why is the University Program important?
- Conclusions

Please note: this talk is my personal perspective, based on our experience at UCSB. Will use UCSB to give examples of what happens in a typical, medium-sized HEP group.

UCSB experimental HEP faculty

- Claudio Campagnari
- Joe Incandela
- Harry Nelson
- Jeffrey Richman
- David Stuart
- Michael Witherell

UCSB group experimental projects

- BaBar
- CDF
- Cryogenic Dark Matter Search (CDMS)
- CMS

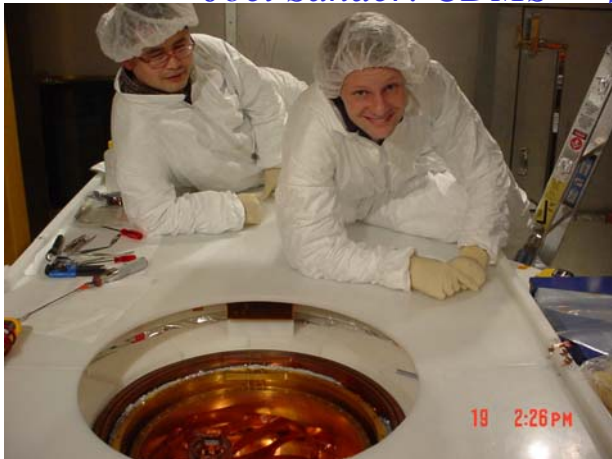
General comments about the university grant program

- The University HEP program is highly successful. It is well managed by the DOE and has made major contributions to progress in the field of high energy physics.
 - ↪ High level of scientific productivity and quality.
 - ↪ University groups have large responsibilities on major projects; very good relationship with national laboratories.
 - ↪ 3 year funding cycle gives stability and predictability; helps with planning and managing long-term projects.
 - ↪ Yearly site visits and progress reports: very healthy for groups, as is the written feedback from peer review.
 - ↪ OJI program: helpful for assistant professors; provides recognition & encouragement, independence.
 - ↪ The program is seriously underfunded...but everybody knows that.

Why is the University Program Important? (I)

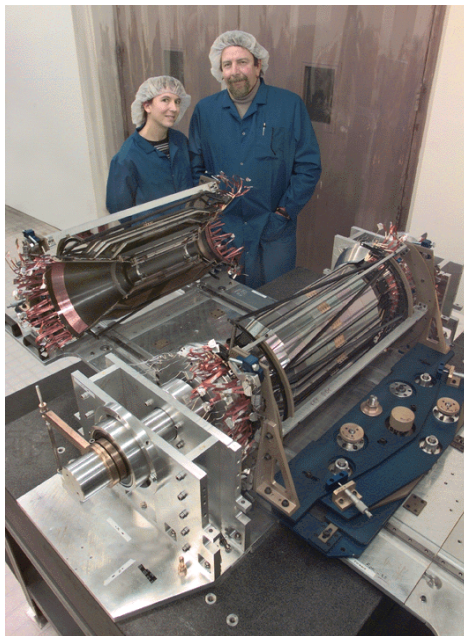
- University groups play a critical role in sustaining the field by recruiting, educating, and training graduate students and postdocs. This role is fundamental and is essential for the future of the field.
- Graduate students and postdocs are one of the most important human resources for detector construction, operations, and data analysis. This work is highly complex and requires people with a high level of skill and motivation. Graduate students and postdocs make huge contributions and are highly cost effective.

Joel Sander: CDMS Steve Kreyer, Jared Deitch, Jim Lamb at CERN Tae Min Hong: BABAR



Why is the University Program Important? (II)

- University groups play major roles in detector design and construction, as well as in project leadership and physics analysis.
- Experienced senior technical staff in university groups can greatly leverage their expertise through the use of graduate students and undergraduates. Highly cost effective.
- Undergraduate students with research experience often go on to graduate school in HEP. This is an important pipeline for our field.



*Dave Hale and Susanne Kyre:
BABAR SVT L1-L3 module assembly*



Dean White: CMS Silicon Tracker Outer Barrel (TOB)



*Part of UCSB CMS TOB
module production team*

Why is the University Program Important? (III)

- The universities themselves provide a wide range of human and technical resources to HEP, including faculty positions, startup funds, infrastructure, research support, and the teaching/training environment.
- To maximize the benefits of this relationship, it is important that university groups carefully explain their goals and accomplishments to people in their universities. Important for us to do “outreach” to our own universities.



CDMS passive shield in UCSB high bay facility (Harry Nelson & graduate student Ray Bunker)

Why is the University Program Important? (IV)

- University groups are a key source of innovative ideas and techniques
 - ↪ It is critical that we preserve the ability of university groups to pursue new ideas. The technical resources of university groups should be strengthened.
 - ↪ University groups can solve problems in many creative ways, and universities are tolerant of unconventional ideas & projects.
 - ↪ Key question: How do we encourage & foster new initiatives?



Conclusions and Prospects

- The University HEP program is highly successful and is well-managed by DOE.
 - ↳ The most serious problem is overall underfunding of HEP, both in the universities and at the national laboratories.
- The great strength of the University program arises from its blending of two complementary missions: education and research.
- We are entering a new and challenging period in our field.
 - ↳ Long time between new construction projects, long distance to CERN, even longer author lists...
- But the scientific case for research in high energy physics has never been stronger, and young people are enthusiastic.
 - ↳ We are addressing compelling questions about the nature of matter and exploring profound connections between particle physics and cosmology.