



U.S. DEPARTMENT OF
ENERGY

Office of
Science

DOE Early Career Programs

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Overview

1. DOE Office of Science Early Career Programs:

- a) Early Career Research (1st cycle completed)
- b) Graduate Student Fellowships (in progress)

2. DOE HEP programs

- a) HEP Theory Fellowships (new)
- b) New ideas



DOE Early Career Awards

- **Total funding of \$85M provided in FY 2009 ARRA**
 - 69 awardees across DOE/SC (from 1750 proposals)
- **Coordinated/managed at Office of Science (SC) level**
- **HEP component \$16M**
 - 4 laboratory & 10 university 5-year awards made in FY2010
 - Steady state funding of ~\$16M will be established for such awards in out-years (about 5% of HEP Core Research)

“This investment reflects the Administration’s strong commitment to creating jobs and new industries through scientific innovation. Strong support of scientists in the early career years is crucial to renewing America’s scientific workforce and ensuring U.S. leadership in discovery and innovation for many years to come.”

– Secretary of Energy Steven Chu



HEP Early Career Program

- **Supersedes HEP Outstanding Junior Investigator (OJI) program**
 - About 150 proposals (about 3x typical OJI pool).
- **Breakdown of proposals:**

	Experiment	Theory	Total
Lab	41	6	47
University	64	43	107
Total	105	49	154

- **Three HEP panels: Lab Experiment, Univ. Experiment, Theory. Panels met in early December 2009.**
- **Each proposal received at least 2 mail reviews and at least 1 panel review**
 - Thanks to our many dedicated reviewers!

Review Criteria

1. Scientific and/or technical merit of the project.
2. Appropriateness of the proposed method or approach.
3. Competency of the personnel and adequacy of proposed resources.
4. Reasonableness and appropriateness of the proposed budget.
5. Relevance to the mission of the specific program to which the proposal is submitted and (*if a lab proposal*) the DOE national laboratory mission.
6. Leadership within the scientific community.



HEP Review Process

- **Each panel identified 2-3 clearly outstanding proposals (4 lab, 4 university)**
 - Plus 3-5 other excellent-to-outstanding proposals
- **HEP program staff met in December to select the final nominees from the pool of ~25 finalists**
 - Considered panel rankings, mail reviews, program balance, innovation, risk/reward, contribution to HEP priorities, impact of EC award in program context
 - **Selected 4 lab and 10 university awards (including all 8 “clearly outstanding” proposals)**

General Observations

- **Reviewers often looked for innovative proposals**
 - Usually something a bit off the beaten track
 - Should be speculative but not too risky
 - Hard to do in established large experiments
- **Reviewers often looked for proposals that would make a significant impact**
 - Many lab and some university proposals suffered from “isn’t the lab/project going to do that anyway?”
- **Many LHC exp’t proposals (2/3 of univ. pool, ½ of lab)**
 - Many solid proposals but few standouts.
- **Strong pool of Theory proposals**



University Awards

Experiment:

- **Amir Farbin**, UT Arlington, *Dark Matter search in ATLAS using multicore GPUs for analysis*
- **Valerie Halyo**, Princeton, *Diamond luminosity monitor for CMS* [[HEP OJI](#)]
- **Rupak Mahapatra**, Texas A&M, *Ge detector development for next generation DM experiments*
- **Alysia Marino**, Colorado, *T2K analysis and LBNE beam instrumentation*
- **Jeff Newman**, Pittsburgh, *Photo-z calibration for dark energy experiments*

Theory:

- **Patrick Huber**, VPI, *Neutrinos in the Universe*
- **Pavel Nadolsky**, SMU, *Integrated analysis of particle interactions at hadron colliders*
- **Matthew Schwartz**, Harvard, *Understanding jets at the LHC* [[HEP OJI](#)]
- **David Shih**, Rutgers, *Supersymmetry Breaking, Gauge Mediation and the LHC*
- **Lin-tao Wang**, Princeton, *Exploring new physics beyond the Standard Model* [[HEP OJI](#)]



Laboratory Awards

Experiment:

- Christopher Mauger, LANL, *LBNE near detectors*
- Ariel Schwartzman, SLAC, *ATLAS Computing and analysis*
- Evgenya Smirnova, LANL, *Photonic band-gap accelerators*

Theory:

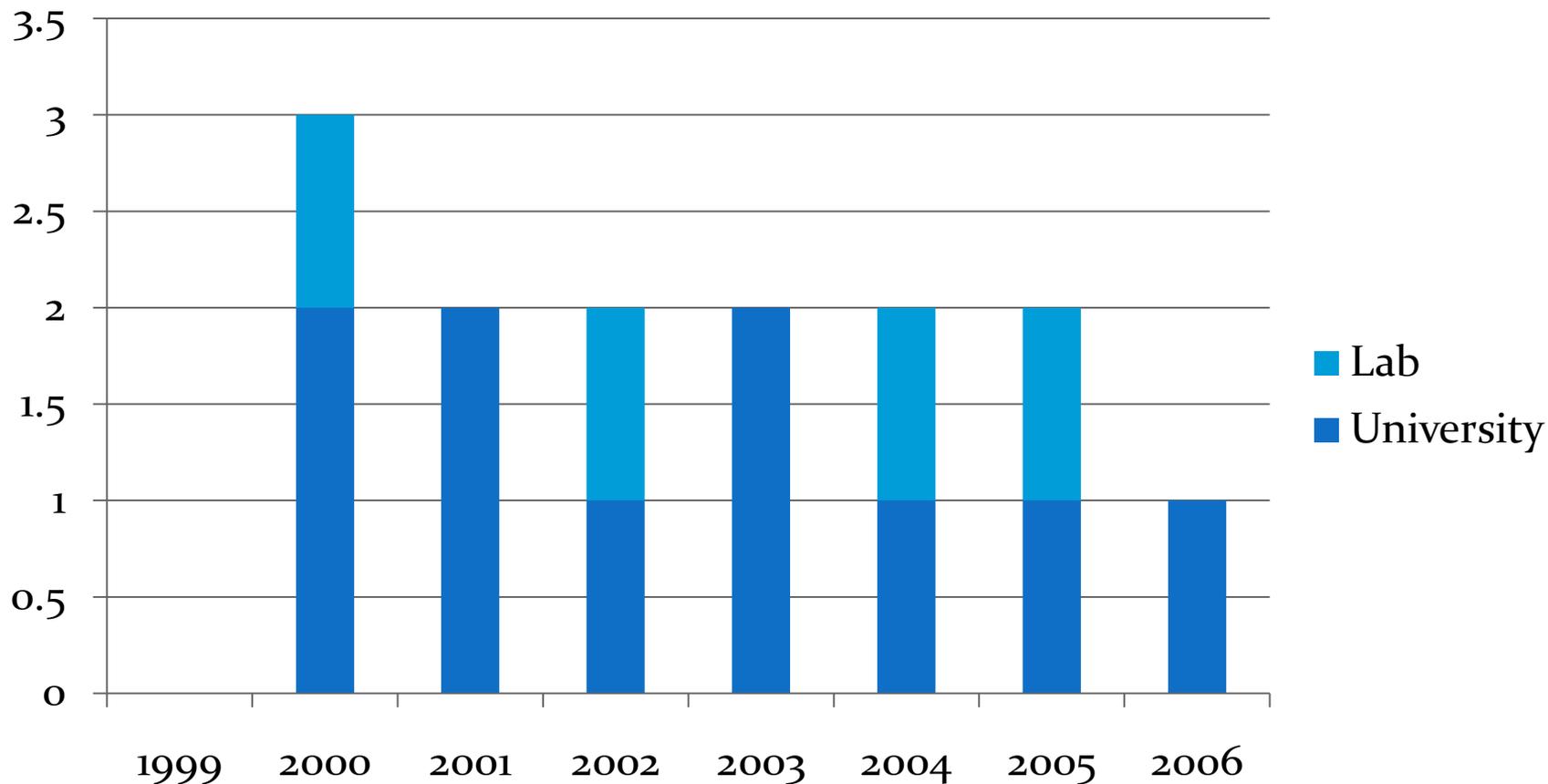
- Christian Bauer, LBNL, *GENEVA: An NLO event generator for the LHC*



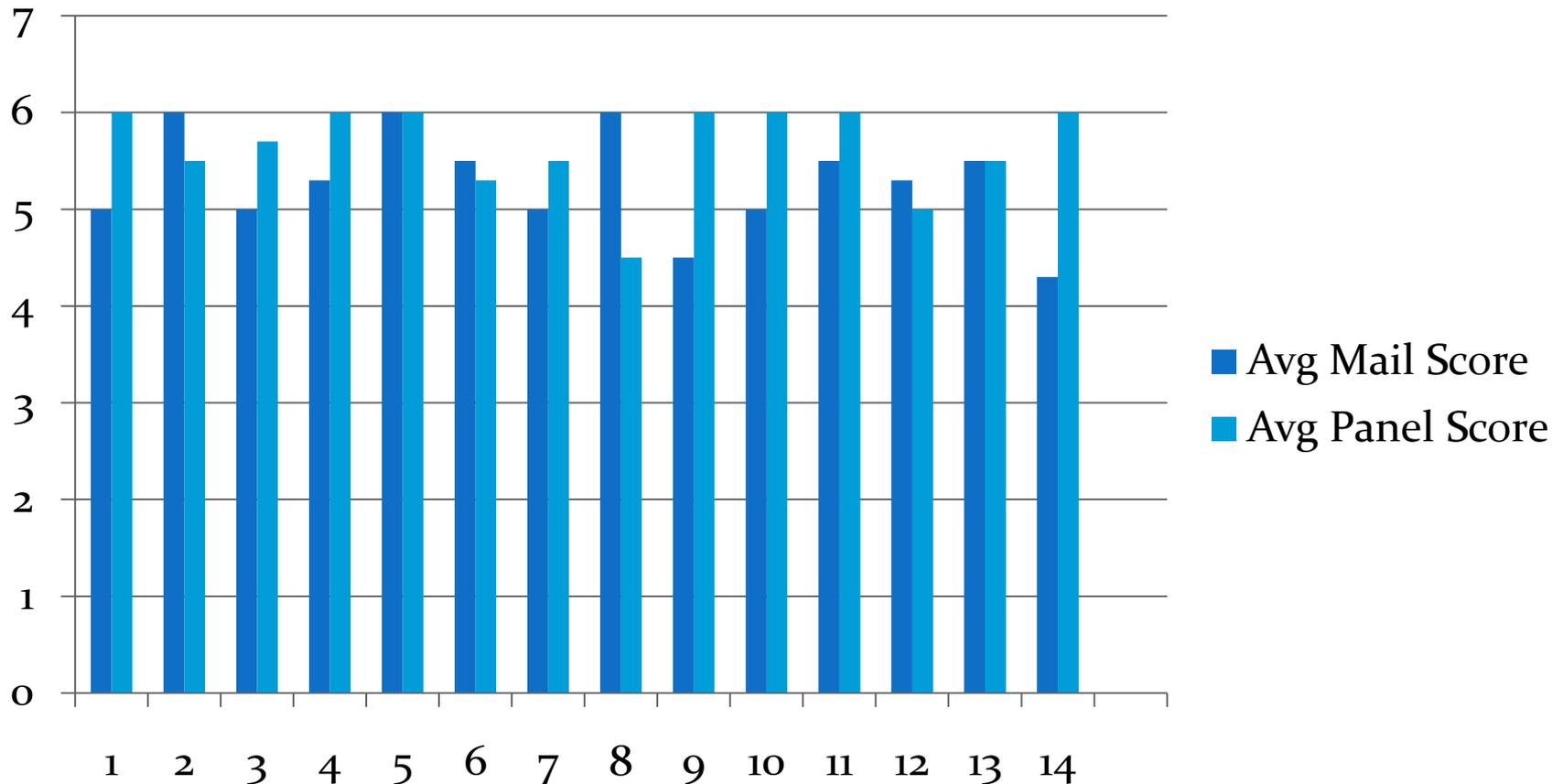
Statistics / Demographics

- **6 theory awards (49 proposals):**
 - Spanning research frontiers but mostly focused on LHC physics
- **8 experiment (105 proposals):**
 - 3 Energy Frontier; 3 Intensity Frontier; 2 Cosmic Frontier; 1 Accelerator R&D
- **3 women; 11 men**
- **6 East ; 4 Midwest; 4 West**
- **Evenly distributed in year since PhD (see next slide)**
 - *NB: there are no HEP EC proposals from very recent PhDs because they are all still post-docs (applicants had to be tenure-track or non-term lab staff)...*

Year of PhD of Early Career Winners



Average Mail and Panel Scores



Next Steps

- **Currently collecting “lessons learned” for next round of EC awards**
 - Peer reviews have been sent to all EC PIs so they can better prepare
 - Proposal timeline may shift, watch for announcement
- **We sent out general guidance on adding new faculty to DOE/HEP grants last week. Salient points:**
 - **All** new faculty members **must** submit a proposal to be considered for funding.
 - With the advent of the EC awards we are discontinuing the practice of using the OJI/EC proposal reviews as a basis for funding new junior faculty
 - Therefore, all junior HEP faculty requesting DOE support, who apply for but do not receive an EC award, need to submit a **separate** individual research proposal
 - If a DOE HEP group’s grant is due for renewal, the PI of that grant **may** incorporate the junior faculty research proposal(s) into the group grant renewal proposal at his or her discretion, but note:
 - Peer reviewers will be asked to specifically evaluate the new faculty on the basis of their individually proposed research. If the research plan for the new faculty is not clear the peer reviews for that component of the proposal are likely to suffer



Office of Science Graduate Fellowships

- **Managed by Office of Science Office of Workforce Development for Teachers and Scientists (WDTS)**
- **ARRA Funding for \$12.5 M, funded for three years. Additional \$5M from FY 2010 appropriation for first year.**
 - WDTS will establish steady-state funding in out-years
- **Open to 4th Year undergraduates through 2nd year graduate students, US citizens only**
 - Received ~3200 applications, expect ~160 awards (across DOE/SC)
 - In final review stages now
 - Winners notified March 30 (target date)
- **Each Fellow to receive \$55.5k per year for three years**
 - \$35.0 k for living expenses
 - \$10.5k for tuition assistance
 - \$ 5.0k research support



HEP Theory Fellowships

- **Initiated in FY2010 in response to needs for improved theory student support (e.g., 2007 HEPAP University subpanel)**
 - Set aside supplemental budget for competitive fellowships
- **Two-year fellowships:** not renewable; automatically end if Fellows obtain Ph.D. degree before the two-year term
 - **Qualifications:** satisfied Ph.D. candidacy requirements and ready to conduct thesis research
 - **Nomination from thesis adviser:** one per institution (current DOE university grantees only)
 - **Deadline this year:** April 5, 2010
 - **Panel to advise on candidates:** based primarily on soundness of the proposed research and demonstrated potential of the nominees
 - **Plan for annual competition**
 - Target 5 Fellows this year; 5 additional Fellows each of the subsequent years



New Ideas

- **Considering lab theory visiting fellowships**
 - Enable theory students to spend research time working with lab mentors
 - Trying to launch pilot program this year at Fermilab
- **Open to other suggestions for new/innovative student programs**