

BES40 Draft Report Presented to BESAC

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Charge for BES40

- The report should highlight a few outstanding examples of major scientific accomplishments emerging from BES support that have shaped the fields of BES research, with an eye toward learning from these examples to motivate BES investment strategies for the future.
- The report should provide technical details as needed for context but should be primarily concerned with the essence of each story as it relates to the larger progress of science.

Charge continued

- What are the major scientific accomplishments that have shaped the BES-supported disciplines in the past 40 years? How has BES contributed to these advances?
- What impacts have these advances had on the Department's missions in energy, environment, or security?
- What are the key aspects of the BES investment strategy that have had the greatest impacts?
- Looking to the future, and building on the Grand Challenge reports, identify research areas and funding strategies to pursue those areas that could further strengthen BES in serving the DOE's missions.

BES40 Subcommittee

Paul Alivisatos –UC Berkeley	Zachary Lemnios--IBM
George Crabtree—Argonne NL	Despina Louca—U Virginia
Cynthia Friend—Harvard	Thomas Mason—Battelle
William Happer—Princeton	Paul McEuen—Cornell
Eric Isaacs—U Chicago	Monica Olivera de la Cruz
Brian Kobilka—Stanford	Ian Robertson—U Wisconsin Madison
	Stephen Wasserman—Eli Lilly Corp
Persis Drell—Stanford	Marc Kastner—Science Philanthropy Alliance

Process for Preparation of Stories

- Stories were solicited from the BES community: >1700 emails sent, 65 submissions received
- The subcommittee met in October to decide on first 9 stories to write—in most cases these were not identical to any submitted, but based on ideas in them
- Also in October MK met with 11 congressional staff members, two administration staff members and two former staffers getting advice on how to write the stories in the most effective ways

Process continued

- Al Hammond interviewed experts recommended by the subcommittee members and BES to write a first draft
- This draft was reviewed by a subcommittee member for accuracy and clarity and by BES staff for accuracy of attribution of BES support
- The draft version after inclusion of suggestions of these referees was posted to the workshop website for comment by the broad community
- A workshop was held in the DC area on January at which we heard proposals for additional stories and proposals were made for recommendations to be included in the report
- At a meeting in February the subcommittee made suggestions for improvements to the stories and finalized the draft recommendations; each story was reviewed by a second subcommittee member

Goals for Stories

- Make BES supported research exciting and important in human (not just scientific) terms. This leads us to often begin with technology that affects people's lives.
- Make stories simple and easy to read—short, no jargon
- Select stories that illustrate BES mission and mechanisms (e.g. facilities, individual investigator, multi-investigator)
- Select topics that are characteristic of BES research without trying to be comprehensive

Thanks to

- SLAC—hosted our two meetings and is managing the financial aspects
- Al Hammond—writing the stories, choosing images, supervising layout
- Scientists who have given Al the material on which stories are based
- BES staff who provided Al with the contacts he needed and carefully read drafts to insure that BES's contribution was accurately described

Research Sources

- **Semiconductor science:** Bill Tumas (NREL), Peter Green (NREL), Nancy Haegel (NREL), Dan Friedman (NREL), Angelo Mascarenhas (NREL), Jeff Tsao (Sandia)
- **Tough Stuff:** John Sarrao (LANL), Carlos Tome (LANL), Steve Zinkle (U.Tennessee-Knoxville), Gary Was (U. Michigan), Rusty Gray (LANL), Armand Beaudoin (U. Illinois), Jim Roberto (ORNL)
- **Superconductivity:** Malcolm Beasley (Stanford U.), Wai Kwok (ANL)
- **HPC:** Thom Dunning (PNNL), Laura Gagliardi (U. Minnesota), Jackie Chen (Sandia), David Dixon (U. Alabama), Jens Nørskov (Stanford/SLAC), Al Wagner (ANL), Malcolm Stocks (ORNL), Kristin Persson (LBNL/UC-Berkeley)
- **Making A Difference:** Nai-Cheng Yeh (Caltech); Mauricio Terrones (Penn State University); Millie symposium at MIT
- **Materials science:** Jim Misewich (BNL), Mike Norman, (ANL), Delia Milliron (Heliotrope, UT, Austin), Robert Tenent (NREL), Marc LaFrance (DOE, EERE)

Research Sources

- **Bioscience:** Janet Smith (U. Michigan), Robert Fischetti (ANL), (since he is on the subcommittee, suggest putting him on the subcommittee grouping), Lisa Keefe (INCA), Thomas Steitz (Yale), Carolyn Larabell (UCSF).
- **Nanoscience:** Peter Denes (LBNL), Jeff Neaton (LBNL), Melissa Summers (LBNL), Jennifer Lewis (Harvard), Shimon Weiss (UCLA), Patricia Dehmer (DOE, retired)
- **Quantum Computing:** John Clarke (UC Berkeley), Joel Moore (UC-Berkeley/LBNL).
- **Waste Clean Up:** Michelle Buchanan (ORNL), Bruce Moyer (ORNL), John Zachara (PNNL)
- **Chemical Industry:** Robert Grubbs (CalTech), Richard Schrock (MIT),
- **Research Facilities:** Paul Langan (ORNL), Stephen Streiffer (ANL), John Hill (BNL)

DOE Staff

- BES Research Sources: Linda Horton, Bruce Garrett, Jim Murphy, Tom Russell, Andy Schwartz, Katie Runkles, Harriet Kung
- BES Reviewers: Jim Davenport, Matthias Graf, Jim Horwitz, Refik Kortan, Jeff Krause, Philip Kraushaar, Peter Lee, George Maracas, Gail McLean, Raul Miranda, Mick Pechan, Mark Spitler, P. Thiyagarajan, John Vetrano
- Office of Science Laboratory Policy Office Research Sources: John LaBarge and Russell Ames
- Help with everything: Katie Runkles, Tom Russell, Harriet Kung