

FINAL REPORT FOR DOE GRANT DE-SC0014456

Materials & Engineering: Propelling Innovation

MRS Bulletin Special Issue Session

Materials Research Society (MRS)

December 2, 2015, MRS Fall Meeting, Boston

Web: <http://www.mrs.org/fall-2015-bulletin-event/>

Video-Recording: <http://www.prolibraries.com/mrs/?select=session&sessionID=6229>

Highlights

A special 3 hour session titled *Materials & Engineering: Propelling Innovation* was held on December 2, 2015 (2-5 pm) at the 2015 MRS Fall meeting in Boston. This session complemented a special expanded issue of *MRS Bulletin* on this topic published in December 2015 that was unveiled at the 2015 MRS Fall Meeting. The session featured three speakers who discussed various aspects of applying materials research outcomes to real-world applications and products. This was followed up a panel discussion with eight participants. The session concluded with a robust Question & Answer session with the audience that included graduate students funded through this DOE grant. A video recording of the full session is available at <http://www.prolibraries.com/mrs/?select=session&sessionID=6229>.

Presentations and Panel Discussion

The session was moderated by Anke Weidenkaff (University of Stuttgart). After an introduction by Dr. Gopal Rao, Editor, *MRS Bulletin*, the session started with three presentations by Sir Colin Humphreys (University of Cambridge), Prof. Julia Greer (California Institute of Technology) and Prof. Tresa Pollock (University of California, Santa Barbara). Sir Humphreys described his experience translating research in inorganic light emitting diodes (LEDs) using III-Nitride materials. Prof. Greer discussed work in her group on architected metamaterials and nanoscale materials that are also beginning to find their way into applications. Prof. Pollock then tied in her experience developing materials and applying them to real applications to the twenty articles in the *MRS Bulletin* special issue, including computational-based materials discovery.

The presentations were followed by a panel discussion with the following participants, including the three speakers:

Sir Colin Humphreys (University of Cambridge)

Prof. Julia Greer (California Institute of Technology)

Prof. Tresa Pollock (University of California, Santa Barbara)

Prof. Y.T. Cheng (University of Kentucky)

Dr. Monika Backhaus (Corning Inc.)

Dr. Greg Galvin (Rheonix)

Prof. Jud Ready (Georgia Institute of Technology)

Prof. S. Suresh Babu (University of Tennessee/Oak Ridge National Laboratory)

The interactive panel discussion was prompted with, “How do you build a bridge from industry to academia,” which seemed to resonate with the scientists in attendance, spurring discussion. Several of the audience expressed agreement that there needs to be some sort of bridge between industrial and academic research, but voiced their frustration in several areas, including (1) they do not have a clear understanding of industrial research needs, (2) the core values of academic research differ strongly from that of industry, and (3) there is not a clearly-defined balance between basic and applied research.

The panel responded by emphasizing the importance of networking and offered a new approach for understanding and responding to industrial needs. “Be a quick listener,” remarked Prof. Jud Ready, as he reflected on the fast pace of industry in comparison to the more slow-paced academic research. Industry typically works off a research timeline of 6 to 18 months, which can be challenging for academic scientists. The panelists proposed that academics be willing to modify their typical research approach in order to effectively bridge the interface of materials research and application. While it is important for industry to have close ties with academia, it is often “up to the researcher to say that they have something interesting to fund,” said Prof. Tresa Pollock. The panelists also debated that there are ways that the core values of academic (curiosity-driven) and industrial (profit-driven) research can work symbiotically to produce a continuum of basic and applied research. For example, Prof. Y.T. Cheng has found ways to work on problems that are important to industry while also focusing on the fundamental applications of the research, which

results in companies co-supporting his students. When establishing partnerships with industry, “it’s important to produce a maximum of learning while dealing with fundamental materials and designs. This fundamental knowledge helps afterwards to understand and build new materials,” said Dr. Monika Backhaus.

In the end, establishing practices to push basic academic research to industrial application is not an easy task. As Sir Humphreys stated, “It’s easier to be an academic that doesn’t talk to industry than one who does talk to industry.” For some, a fundamental change in mindset will be required to shift their focus from basic research to problems with immediate, real-world applications. For others, it will require more networking to establish the key connections needed for research development. As newer technologies push the boundaries of materials research, the Materials Research Society will continue to serve as an excellent resource to network and find mentors to help members bring their research to full development.



DOE Funds

Limited travel support in the form of student reimbursement for the meeting registration fee and partial travel expenses were available for students who submitted a request. Solicitations for the applications were sent to MRS Student Chapters and applicants were screened for their stated interest in attending the session. The \$7,000 provided by DOE was allocated to 12 students listed below including registration (ranging from \$110 to \$135 depending on whether they were already an MRS member during registration) and travel expenses (ranging from \$0 to \$809.95).

Victoria Chernow
Chi-Sing Ho
Jonathan Rea
Daniel Shore
Aslihan Babayigit
Adriana M. Rivera
Yaowu Hu
Spencer Fenn
Andrew Westover
Marcel M. Said
Biwei Deng
Humaira Taz