

Managing Labs and Mentoring a Research Group

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Outline

My professional background

Mentoring, not just advising

Themes of my Research group

Lab management and structure

Collaborations / Examples

My professional experience in Engineering: Mechanical, Materials, Electrical, Chemical

- B.S. (IIT Bombay) – MS (Berkeley) – Crystal Grower (Stanford CMR)–Process Engineer (GTE)–Ph.D (Berkeley)
- Academia (1976 to now): Lehigh, Illinois (UIUC) Arizona (Tucson) and UC Davis

BEING A MENTOR- NOT JUST ADVISOR

Professional interests of the student and his/her future career and personal goals.

Success in graduate school academic life

Fashioning a personality that builds trust,

Shared experiences, respect of divergent views, teamwork, collegial discourse.

Features of mentoring

Some common priorities of mentoring

Respect students as colleagues

Encourage sharing of ideas

Experiences good and bad

Role of Mentor

How involved should a mentor be in:

- 1) The student's research
- 2) The students' s career development
- 3) The student' s personal life issues

Style of Mentorship

Encourage professional independence

Define their own research and solve problems

Attend conferences and to publish.

Provide opportunities for students to know other faculty and industry scientists

Research Themes

- We make *NEW MATERIALS* for Nano/ Bio, Photonics, & Electronics Devices
- Quantum Dots, Aerogels, Luminescent Materials, Ceramics and Glasses
- Research requires well-equipped labs AND
- *GOOD PEOPLE WHO WORK WELL TOGETHER*

Collaboration-example

- **NSF-NIRT: Aerogels and Nanoporous Materials for Biological Membranes**

NSF NIRT BES 0506602

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LAB WORK (e.g. synthesis of nanocrystals)

Finely ground glass powder + semiconductor powder

Co-melting above liquidus temperature

Dissolution of mixture to form melt

Casting into shapes/fibers

Striking (heat treatment)

Structural/optical/mechanical characterization



Mentoring by teamwork



Examples of Successes

Academia:



- Robert Speyer (Georgia Tech)
- Prashant Kumta (Carnegie Mellon)
- Li-Chi Liu (Univ in Taiwan)
- Brian Phillips (SUNY-Stony Brook)
- Valerie Leppert (UC Merced)
- Lilian Davila (UC Merced)

Examples of Successes

Industry/National Labs

Lynne Gignac (IBM Watson)

Paul Jankowski (GM)

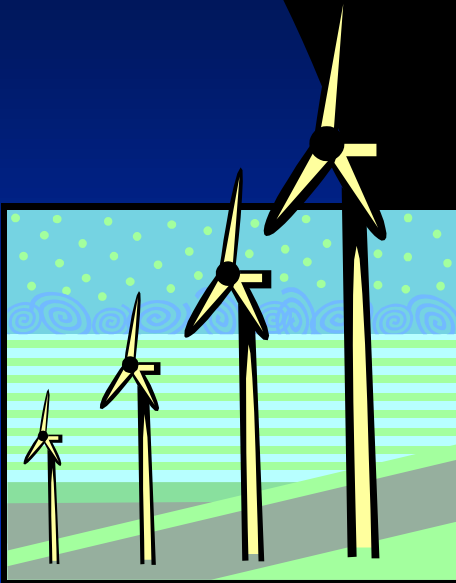
Bill Tredway (United Technologies)

Karen Cummings (Los Alamos)

Jesse Shan (Mitsubishi)

April Vaverka (Kimberly Clark, GA)

Riham Morcos (Johnson & Johnson)



Examples of Successes

Entrepreneurs and Business

- Brian Underwood (Saratoga)
- Christine Gulbranson (VP-UCOP)
- Arya Bhattacharjee (Livermore)

