

PROFESSIONAL DEVELOPMENT PANEL FOR WOMEN FACULTY: PATHWAYS AND CHECKPOINTS

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Abstract

Finishing the Ph.D. is always considered to be the hard part; but it is simply the beginning of a long string of challenges and opportunities, checkpoints and pathways. Many women are drawn to an academic career path because of their interest in teaching, research, and outreach potential to others. But sometimes the pathways to success seem unfriendly or unclear. It is not always easy to chart one's progress and define the steps needed to accomplish a goal. And it can be all too easy to get sidetracked, particularly for women. This panel brings together women faculty to address some of the paths and steps in navigating a successful academic career. Three pathways will be covered: the non-tenure research track, industry or government experience first, and the traditional academic track. Checkpoints to be addressed include tenure, promotion to full professor, and moving into the administrative track. Panelists include women from all three paths at different points in their careers. While difficulties for women in particular will be addressed, the focus of the panel will be on the positive actions women can control and use to define a thriving career in academia.

Introduction

In the 2002-2003 academic year, 17.4% of doctoral degrees in Engineering and Computer Science in the United States were awarded to women¹. The distribution of these degrees ranged from virtually none in the Mining and Architectural engineering fields to more than 30% in the Biomedical, Environmental, Engineering Management, and Computer Science (outside of engineering) programs¹. These women are now settling into their first positions as doctorates and are trying to determine what is next in their career lives. In that, they join with hundreds of women before them in ascertaining where they want to go and how they can best get there.

While most women engineers at entry-level positions start out even with or perhaps somewhat higher than their male counterparts in terms of salary and title, as they progress in their careers they tend to fall behind in status, pay and positions². The reasons for this are extremely complex and resist easy categorization^{2,3}. Some of the reasons given include historical gender roles, biology, economics, the academic culture, and women's choices. Issues such as these will be addressed by this panel as we look at pathways and checkpoints to a successful academic career.

Discussion

Many women are drawn to an academic career, and it is certainly a viable option for a professional with a doctorate degree. Entrance to an academic career may come immediately following the earning of a doctorate or after one or more stints in an industrial or government

laboratory as a research associate/scientist or post-doctorate. Once inside academia, a professional chooses among tenure track or non-tenure track pathways. While traditionally women were relegated to the non-tenure track roles^{2,3}, more women are taking charge of their careers and making informed decisions with respect to tenure versus non-tenure track positions. The percentage of women tenured/tenure-track faculty members has slowly been increasing (9.9% of all engineering faculty in 2003 versus 8.9% in 2001¹). Women held 17.4% assistant professorships, 12.3% associate professorships, and 5.2% full professorships in 2003¹. Women are making slower inroads into administration: from data collected in 2000 from Association of American Universities (AAU), 2.7 % women were department chairs⁴. It is more difficult to find up-to-date data on women holding assistant, associate or full dean positions. Rough data suggest that 4.6% of approximately 350 engineering schools/colleges nationwide are headed by women. Some of the checkpoints to be addressed in this forum are tenure, promotion to full professor, and moving onto the administrative track.

The focus of this panel will be to discuss some of the steps towards a successful academic career and the importance of making plans, considering options, and setting goals. Decisions about a woman's career development seem more complex when marriage and family plans are factored in to the equation. Does a non-tenure track position provide a better balance of professional and personal goals? Is it possible to have a successful faculty career and a family? What is the trade off in early versus late entry into academia? How does one determine the ramifications of a decision on a career? Since a pathway that works for one woman may not be possible for another, how do women professionals support and promote other women to succeed in academia? While pitfalls, discrimination, and dead-ends may be addressed, the emphasis will be on each professional recognizing the various pathways to success and making informed decisions as she navigates her way toward her goals.

At the beginning of the session, the moderator will describe the three pathways under consideration: the non-tenure track, industrial or government experience before entering academia, and the traditional academic track. She will then introduce each panelist. The panelists, described in detail in the next section, come from all three paths and are at different points in their careers. Each will be given the opportunity to say a few words about her choices and steps in career development. Some of the panelists may have questions for other panel members, and questions will also be accepted from the audience. Participants are also welcome to email potential questions for the panelists to the moderator F. Carroll Dougherty at doughert@jaguar1.usouthal.edu.

Panelists

The six panelists are Dr. Linda Bushnell, Research Professor, University of Washington; Dr. Molly Shor, Research Professor, Oregon State University; Dr. Molly Gribb, Professor, Boise State University; Dr. Janet Hampikian, Professor and Associate Dean of Academic Affairs, Boise State University; Dr. Amy Moll, Chair and Associate Professor, Boise State University; and Dr. Cheryl Schrader, Dean and Professor, College of Engineering, Boise State University. The moderator is Dr. F. Carroll Dougherty, Assistant Professor, University of South Alabama.

Dr. Linda Bushnell

Linda G. Bushnell received her B.S. degree in electrical engineering and an M.S. degree in electrical and systems engineering from the University of Connecticut in 1985 and 1987, respectively. She received an M.A. degree in mathematics (1989) and her Ph.D. degree in electrical engineering (1994) from the University of California at Berkeley. She was the Program Manager of the Systems & Control Program at the U.S. Army Research Office and an Adjunct Assistant Professor of Electrical and Computer Engineering at Duke University from 1994 to 2000. In August 2000, she joined the Electrical Engineering Department at the University of Washington, where she is now a Research Assistant Professor.

Dr. Bushnell is currently the Secretary-Administrator of the IEEE Control Systems Society. Her research interests include networked control systems and autonomous mobile robotics.

Dr. Molly Shor

Molly H. Shor received her A.B. degree cum laude in applied mathematics from Harvard University in 1984. She was awarded M.S. and Ph.D. degrees in electrical engineering from University of Illinois at Urbana-Champaign in 1987 and 1992.

Dr. Shor joined the Department of Electrical and Computer Engineering at Oregon State University (now part of the School of Electrical Engineering and Computer Science) in 1992 as a tenure-track faculty member. She began strong with two NSF grants, but soon was confronted by a choice between starting a family and only having a career. She chose to start a family. She is the proud mother of a nine-year-old daughter – Asha Gupta – and has no regrets about that decision. However, she did have to make difficult choices along the way – how many hours a week to work, how much family time to spend, how stressed or relaxed a life to live, and what types of contributions to make at work. She shifted to a fixed-term faculty position with advising and undergraduate program coordination duties and a senior research faculty position with research activity in 2001 in order to better balance family and career. She served as a part-time visiting professor during the summers of 2000 and 2001 at Oregon Graduate Institute, now OGI School of Science and Engineering at Oregon Health Sciences University.

She was one of the original founders of an international professional network *Women in Control* for women in her professional field, compiling the original mailing list and membership information and participating in the organizational meetings. She has been actively involved in membership, public information, conference organization, and education activities for the IEEE Control Systems Society (CSS) and the American Automatic Control Council (AACC) – including five years service as a member of the CSS Board of Governors, ten years service on the CSS Membership Activities Board, five years service as a member of the CSS Technical Committee on Control Education, four years service on various IEEE and AACC award committees, and service as finance chair or co-finance chair of four major conferences – IEEE Conference on Decision and Control 1996, 2002, 2004, and 2005. In 2000, she was elevated to Senior Member of IEEE.

Dr. Molly Gribb

Molly Gribb has been an associate professor in the Department of Civil Engineering at Boise State University since 2000 and professor since 2005. Dr. Gribb earned M.S. and Ph.D. degrees in Civil Engineering from the University of Wisconsin-Milwaukee, and is a licensed professional engineer in Idaho. She began her academic career in 1993 as an assistant professor and first female faculty member ever in the Civil Engineering Department, and only female faculty member in the College of Engineering at the University of South Carolina. In 1999, she was granted tenure and promoted to associate professor. She teaches and does research related to groundwater, contaminant transport, and unsaturated soils. Dr. Gribb currently leads a multidisciplinary research project sponsored by the EPA to develop multi-purpose sensors to detect and analyze environmental contaminants, and is involved in another collaborative grant with faculty in the geosciences department to study the effects of spatial and temporal variability of soil properties on watershed processes. One of her major research interests continues to be the development of a new cone penetrometer tool for determining the hydraulic properties of unsaturated soils, for which she has received a NSF CAREER Award and an ARO young investigator award while at South Carolina. Dr. Gribb also received DURIP and NSF Idaho-EPSCoR equipment grants while at Boise State to obtain a truck-mounted direct push system and the associated tooling to further this research. She has taught introduction to Civil Engineering, hazardous waste engineering, groundwater contaminant transport, hydrogeology, vadose zone hydrology, and research methods courses while at Boise State.

Dr. Janet Hampikian

Dr. Janet M. Hampikian is Associate Dean for Academic Affairs in the College of Engineering and Professor of Materials Science and Engineering at Boise State University. She earned a B.S. in Chemical Engineering in 1983, an M.S. in Metallurgy in 1986, and a Ph.D. in Materials Science in 1990, all at the University of Connecticut at Storrs. She began her academic career in 1992 at Georgia Tech after spending two years as a Visiting Scientist with the Commonwealth Scientific and Industrial Research Organization in Melbourne, Australia, as part of a National Science Foundation (NSF) post-doctoral fellowship. In 1996, Dr. Hampikian was awarded a prestigious NSF CAREER Award for her work in high temperature coatings. In 2004, she joined the Materials Science and Engineering faculty at Boise State. She is a member of numerous materials and educational societies including TMS, ASEE, ASM, SWE and ABET. Her areas of research specialization include biomaterials, nanomaterials, thermal barrier coatings, ion implantation, oxidation and brachytherapy. She has authored more than 60 archival journal articles/books and is co-inventor on three U.S. patents.

Dr. Amy Moll

Amy J. Moll is Associate Professor and Chair of Materials Science and Engineering at Boise State University. She joined the faculty in August, 2000. Dr. Moll received a B.S. degree in Ceramic Engineering from University of Illinois, Urbana in 1987. Her M.S. and Ph.D. degrees are in Materials Science and Engineering from University of California at Berkeley in 1992 and 1994, respectively. Following graduate school, Dr. Moll worked for Hewlett Packard in San

Jose, California and in Colorado Springs, Colorado. Along with Dr. Bill Knowlton, Dr. Moll founded the Materials Science and Engineering Program at Boise State. The new department – formed in July 2004 with a generous donation from the Micron Technology Foundation – offers a Master of Science, a Master of Engineering, a Bachelor of Science and a Minor in Materials Science and Engineering. Dr. Moll’s research interests include microelectronic packaging, particularly 3-D integration and ceramic MEMS devices. She especially enjoys teaching the Introduction to Engineering and Introduction to Materials Science and Engineering courses as well as engineering outreach activities. Dr. Moll is the SWE chapter advisor at Boise State.

Dr. Cheryl B. Schrader

Cheryl B. Schrader became the Dean of Boise State University’s College of Engineering in July 2003. She joined Boise State University following twelve years with the University of Texas at San Antonio, where she was Associate Dean for Graduate Studies and Research in the College of Engineering and the College of Sciences and Professor of Electrical and Computer Engineering. Dr. Schrader previously held positions at McDonnell Douglas Astronautics Company; Valparaiso University; Rice University; and Chimera Research. She completed her Ph.D. and M.S. degrees in control systems at the University of Notre Dame. Dr. Schrader received her B.S. degree in electrical engineering with high distinction from Valparaiso University, where she was an honors college associate.

Dean Schrader has an extensive record of publications and sponsored research in systems and control and has received several best paper awards. In 2003 she received the Exemplary Online Course Award from WebCT and was Senior Fellow with the Texas Higher Education Coordinating Board. Other awards include the 2002 Engineering Excellence Award from Steven Myers & Associates for excellence in engineering and the 40 Under 40 Rising Stars Award from the San Antonio Business Journal for leadership, career success and community involvement. The NSF workshop “After Graduation: Women in Control Taking a Leadership Role” held at the 42nd IEEE Conference on Decision and Control was dedicated in her honor. She was named to Idaho Women Making History in 2005.

Dean Schrader is the Past President of the Institute of Electrical and Electronics Engineers (IEEE) Control Systems Society, a professional organization with 9,000 members worldwide. She served the IEEE Control Systems Society in a number of positions including Past President (2004), President (2003), President-Elect (2002); IEEE Director, American Automatic Control Council (2002-2003); Vice President, Conference Activities (2000-2001); Member of the Board of Governors (1995-2001); IEEE Conference on Decision and Control, 2000 Program Chair, 1998 Program Vice-Chair, 1996 Publications Chair, 1995 Registration Chair, 1993 Local Arrangements Chair; Chair, Nominating Committee (2004-2005); Chair, Long Range Planning Committee (2002); Chair, Women in Control Committee (1998-1999); Chair, Student Activities Committee (1996-1997); Associate Editor, Conference Editorial Board (1995-1996).

Dr. Carroll Dougherty

F. Carroll Dougherty is a tenured Assistant Professor in Mechanical Engineering at the University of South Alabama in Mobile. She has worked in both government laboratories and academia, as well as managing her own company, Chimera Research, for a short while. She earned her bachelor's degree in aeronautical/astronautical engineering from Purdue University in 1979. Her M.S. and Ph.D. degrees are also in aeronautical/astronautical engineering, from Stanford University in 1981 and 1985, respectively. She was a Research Scientist at NASA Ames Research Center from 1979-1986. She has held tenure-track positions at the University of Colorado, Boulder (1986-1990), the University of Texas at San Antonio (1996-1998), and the University of South Alabama (1998-present). She has also held a part-time faculty position at the University of Texas at San Antonio (1990-1994) and a visiting professorship and research associate position at the FAMU-FSU College of Engineering (1994-1996). Her company, Chimera Research, was active from 1990 through 1994.

Her research emphasis is in computational fluid dynamics, unsteady aerodynamics and biofluid mechanics. She has applied numerical methods to a wide range of problems including transonic flow separation, hypersonic waveriders, blood flow through heart valves, and hurricanes. She currently has a joint experimental/computational project evaluating pressure harmonics in arteries, as well as a collaborative effort with meteorology professors modeling ideal and landfalling hurricanes. She is a member of ASME, ASEE and a senior member in SWE. She has been the faculty advisor or co-advisor for the student SWE chapters at the University of Colorado, the FAMU-FSU College of Engineering, the University of Texas at San Antonio and the University of South Alabama.

Expected Outcomes

While it is unlikely that a single, clear-cut path will be defined, an understanding of different pathways and choices for women in academia will emerge from the anecdotes and experiences of the women on the panel. The authors hope that women participating in the panel will have a better idea of the various pathways and checkpoints necessary to achieve their goals. They will then be able to make their own informed decisions as they attend to their careers.

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Biographical Information

F. CARROLL DOUGHERTY is a tenured professor in Mechanical Engineering at the University of South Alabama. She has had a somewhat unusual career as she has tried to balance family and work concerns. Now that she is grown up (has tenure), she is trying to decide what comes next. She and Dr. Schrader have collaborated many times in the past 14 years as their career paths have overlapped.

CHERYL B. SCHRADER has had a very successful career in academia, rising through the ranks at the University of Texas at San Antonio and currently serving as the Dean of the College of Engineering at Boise State University. She has always been interested in supporting and mentoring women in engineering.