

## Women in Science & Engineering (WISE) Forum - Women's Career Development

The WISE forum, organized by KWiSE and held on Saturday morning during the UKC2006 conference, was organized into two parts: a panel presentation by six distinguished Korean women scientists, followed by a roundtable discussion. KWiSE President, Dr. Gye Won Han (TSRI), and co-chairs, Drs. Sooja Kim (NIH) and Kwang Hwa Chung (KRISS), opened the forum by welcoming the participants. The forum provided a rare opportunity to bring both established and junior level scientists together, as well as those with different career developmental paths. The speakers presented various challenging issues impacting women scientists, ranging from the educational/professional pipeline and unconscious bias, to balancing family and work with the purpose of empowering the current and new generations of talented women to assume a leadership role in science and technology and how they might achieve sustainable professional development.

Dr. Kwang Hwa Chung from KRISS talked about the progress of Korean women scientists within the scientific structure in Korea: their status, career opportunities, policy recommendations, and disparities between different technologies. Despite increases in the number of women scientists and career opportunities, the employment profile of the different age groups shows that fewer women are engaged in the profession in the 30-39 age group, reflecting child birth/care time for women. Recognizing substantial progress in the recent past, Dr. Chung further suggested that, in addition to the many newly implemented policies and government programs, such as Women into Science and Engineering and the Women's Academy for Tech Challenger in the 21C, and the other programs -legal, political, and social- that are being planned within the social system of science to support the development of women scientists, an infra-structure that alleviates science-external obstacles, such as family responsibility and work flexibility, is needed in order to retain women scientists in the workforce. Similarly, in the US, the underlying causes and theories about women's status in science are constantly being examined, as evidenced by numerous readings and conferences on the status of women scientists, such as the one notably held by the New York Academy of Science. Inarguably, women scientists still face many challenges in both academia and industry. A *Science* article published in August 2005 states, "Women represent nearly half of all Ph.D. graduates in biology but comprise only about 30% of assistant professors, 25% of associate professors, and 15% of full professors within the biological sciences. The situation is even more dismal for women in the physical sciences and engineering, where, in some fields, women earn as few as 11% of Ph.D.s, and only about 6% and 4%, respectively, of tenured full professors are women."<sup>(1)</sup>

What factors contribute to the departure of women from the tenure-track pipeline? Professor Chong S. P. Sung from University of Connecticut and Professor Myunghee Cho Paik from Columbia University, both of whom serve on their own schools' promotion/tenure committee, shared valuable information about the academic career in US research universities. Clarifying some myths associated with the tenure process, they stressed quality of research and teaching, and extent and types of service to the university as being three important components for obtaining tenure. The elements of success for each component were elaborated in detail: how to obtain funding/awards and research accomplishments, and recruit high-quality graduate students/post-docs, which teaching courses to select and how to manage teaching responsibilities, and how to participate actively in committees inside and outside the university.

A further, science-external issue may contribute to the "leaky pipeline" for producing successful women scientists. Whether in the academic or industrial scientific structure, many married

women scientists face the challenge of synchronizing their own career, their partner's career, and motherhood. The balancing act between work and family is perhaps one of the main, ageless challenges of all women, including women scientists. On this note, Dr. Mimi Kim of Albert Einstein College of Medicine assessed the current issues faced by American women scientists. They include the ongoing gender gap, which results in less income and fewer women in higher-level positions, and difficulty in balancing work and family. She further stated that women tend to be less active in promoting themselves, therefore staying in the lower-ranks longer. Based on her experience as a mother and a woman scientist raising a young family, she emphasized the importance of a support system, both at home (reliable child care, supportive spouse) and at work (flexibility in work/promotion schedule, good mentoring and guidance, network of colleagues and friends, family-friendly policies).

In addition to both internal and external support structures, there is compelling evidence in all areas of professional activities and all stages of career paths in support of effective communication as one of the most essential skills for success. The 21st Century Literacy Summit (2002) noted, "Information and communications technologies are raising the bar on the competencies needed to succeed in the 21st century". Dr. Esther Yang, from Abbott laboratory, described the basic process of effective communication and how to use this to play a facilitative role in achieving goal(s). She also presented her own leadership model, developed through open communication. Leadership is a process by which a person influences others to reach an objective and directs the organization to make it more cohesive, coherent, and collaborative. Leadership not only conveys a sense of direction and a strong vision of the future for others, but also needs to be exercised on oneself. In summarizing, the co-chair of the forum, Dr. Sooja Kim (NIH), discussed how to achieve/find a sense of direction within oneself and how career women can achieve a career-life balance.

The forum was attended by 25 professionals from different scientific disciplines, including academic and government administrators, leaders of corporations, faculty, and researchers. Following the panel presentation, the forum continued with a roundtable discussion with the participants, moderated by Dr. Sooja Kim (NIH). The participants shared their own experiences, failures, successes, and views, and discussed interesting and thought-provoking issues affecting women at various stages of their careers.

The participants included the following: Dr. Hee Koo Moon, Solar Turbines; Dr. Young Gil Kim, the President of Handong Global University; Dr. Moonja Park Kim, US Defense Contract Management Agency, Knowledge Manager; Prof. Kyung Hwa Yoo, Yonsei University; Dr. Young Sook Yoo, KIST; Dr. Sun Hwa Hahn, Korea Inst of S&T Information; Dr. Gye Won Han, TSRI; Dr. Misoon Mah, AFOSR/AOARD; Prof. Tom Hahn, UCLA; Prof. Jin Kim Montclare, Polytechnic University; Prof. Soon Ae Chun, City University of New York; Dr. Sunwoo Anne, Lawrence Livermore NL; Dr. Hye Jin Lee, UCI; Dr. Nakyeon Choy, Sanofi-Aventis, Dr. Eunha Hoh, USDA ARS; Dr. Hyosook Jang, University of Western Ontario, London, Canada; Sook Hyun Kim; Dr. Jane Oh, NASA/JPL, Dr. Arianna Kim, Columbia University

- Arianna Kim, Ph.D.

---

<sup>1</sup> Handelsman J, Cantor N, Carnes M, Denton D, Fine E, Grosz B, Hinshaw V, Marrett C, Rosser S, Shalala D, Sheridan J. More Women in Science, Science 309: 1190-1191