

Panel on Non Academic Careers

Reported by Janet Tate, session chair

Invited speakers in this session were Venky Venkatesan (Neocera), Bijoy Chatterjee (National Semiconductor) and Shirley Chiang (UC Davis, ex-IBM Almaden)

Venky Venkatesan had a last-minute cancellation, but he sent a presentation. He cited his own group at University of Maryland as a case in point and pointed to several others nationwide where entrepreneurial activity by the faculty advisor leads to almost 1/3 of PhD students following that particular career path. Thus role models are very important. Failing the presence of such role models, departments should forge connections with industry, appoint adjunct faculty who fulfill the role. Students should be trained to manage conflict of interest and encouraged to pursue business courses that allow them to understand relevant financial issues.

Bijoy Chatterjee pointed to the enormous advantage a physicist brings to an industrial endeavor by being able to understand things at a fundamental level. He also pointed out those large companies like his need better understanding of physical phenomena at a "systems" level where many complex processes and ideas from different areas are combined. A physicist should be able to understand and explain the elements and their interconnection, and this is not always the case. He recommended a steady stream of analytical lab experiences throughout the graduate program. He wondered if an example of a good "analytical lab" activity is for the class to analyze an ipod over a semester, for example, and be able to explain the physical principles at work in the different parts of the device and what's important about how they work together. He stressed the high premium that industry places on the ability to be a "team player" and communicate effectively. He expressed surprise in noting the fact that most graduate Physicists go to Industry but the curriculum and funding from NSF do not give priority to requirements of the Industry.

Shirley Chiang was a research scientist at IBM Almaden from 1983 – 1994. She pointed out the skills that PhD physicists have that are valued by industry (Problem-solving ability, adaptability, equipment expertise, mathematical and computer modeling, computer-programming, -interfacing, -data-acquisition, data analysis – statistics, making models, fitting experimental data, image processing, interdisciplinary skills, team skills, oral and written communication skills). She enumerated some of the positive aspects of industrial employment (interesting science, higher salary, no need for post-doc, hands-on research rather than supervision (at least initially), easier to obtain funding (though that may be changing), and more options to accommodate "the two-body problem". Some of the difficulties she thought were the short time scale in industrial research, difficulty publishing (may close door to future academic position), need to be on call, lack of control over research direction, "old boy network" operates, and the lack of recognition by potential employers of the "Ph.D. Physics" label compared to an "engineer" label. She did not think the PhD should be changed to accommodate narrow industrial demands, but the already valued skills could be enhanced. She suggested that the following should be evaluated as to whether they are useful for industrial careers: Industrial internship, Business and entrepreneurial courses,, M.S. in Engineering, MBA.