

Breakout Session on Mentoring and Career advising

Reported by Janet Tate, session chair

Steve Carlip (UC Davis) led the discussion. He pointed out that there are two issues (1) mentoring and advising on non-curricular issues, which is largely non-controversial and (2) mentoring and advising on curricular issues, which is much more controversial, because it touches on changing the curriculum in response to perceived swings in the demand for particular expertise in the industrial sector as well as university-industry collaborations in which a student is essentially solving a problem for a particular company (see the 12/16 article in the NY Times, "Bell Labs Is Gone. Academia Steps In," for example). The discussion started on (1), and did not have time to explore (2). The following is a synopsis of the discussion in the session and in the wrap-up session that followed.

1. *Advising students about non-academic career options.* Faculty are well-informed about how to help students pursue academic jobs, but most are uninformed about non-academic career options. Much discussion ensued about the perception that physics professors, whether wittingly or unwittingly, foster the impression among their students that a career outside of academia represents a consolation prize, and that the student who doesn't land a professor position "didn't quite make it". At worst, this is elitism; at best faculty are simply enthusiastic about their own careers, and uninformed about alternatives. Either way, the students are left with the same impression. Students present concurred that this was the message they were getting, and that, moreover, this same message is being conveyed to undergraduates. Furthermore, this focus on the success of a professor's students in obtaining academic jobs can translate into bias in the award of funding. Two people reported independently that it was explicitly stated in two NSF peer review panels that non-academic jobs by the students "didn't count" in the measure of a research group's success.

There was general agreement that this attitude is unhealthy for physics, and there were several suggestions to change the climate.

- (a) Explicit discussion among faculty of the elitist perception being fostered and honest examination of the local climate in physics departments.
- (b) There was general support for some sort of statement by the APS on the purpose of Ph.D. in physics. The exact wording wasn't discussed, but the general idea would be that the purpose is to produce educated, independent, researchers who will populate the ranks of research and development in industry, academia and the national labs, who will populate the ranks of educators at all levels, and who will inform public science policy, and so on. Input from FIAP and CPDL should be sought.
- (c) Representing researchers from outside of academia in departmental colloquia, seminars etc.
- (d) Fostering scientific connections between graduate students and industry and other non-academics. Examples cited were a U Washington student-run seminar series (<http://students.washington.edu/cdophys/index.shtml>), UC Davis and U Texas Austin have something similar, and Texas A&M has a series where students present their work to industrial visitors without faculty present.
- (e) Making faculty aware of resources for their students to learn of opportunities for physicists in non-academic careers (Wall Street, science policy, entrepreneurial positions etc). Many such collections exist (including on the APS website). Centralizing them on the APS website might help.

APS Outreach site (w/non-traditional career stories): www.physicscentral.com

APS Careers page: www.aps.org/careers

- (f) Better knowledge of where Ph.D. physicists are employed would be helpful. Current AIP statistics quote initial employment (just out of PhD), which includes large numbers of post docs, many of whom later leave academia. AIP does not track their subsequent employment.
- (g) Increased presence in physics departments of industrial collaborators; increased entrepreneurial activity by faculty.

2. *Improved professional and networking skills for students*

General agreement that students need more help developing non-technical skills that are critical in any subsequent employment.

- (a) Providing opportunities for students to practice communication skills (seminars, local and regional conferences *etc.*)
- (b) Fostering contact between students and departmental alumni to help with networking – make a database to which students have access.
- (c) Encourage students to join APS or other representative society to represent their interests.
- (d)

3. *Resources*

All recognized that much advising and mentoring is done on limited time and resources. The consensus was that departments in general do not do enough to mentor students.

- (a) Frank discussion among faculty about the mentoring responsibilities of individual faculty as part of the job description
- (b) Adding administrative staff whose job is industry outreach, internship coordination, and tapping university resources like alumni data bases, university advancement/outreach activities, and so on
- (c) Recognition of departmental responsibilities in mentoring (for example, TA training is obvious, but a department could assume higher profile role in other aspects such as formal ethics training, communications *etc.*)