

"Frontiers of Science" in the Core Curriculum

David J. Helfand, Professor of Astronomy at Columbia University, laments not only a lack of scientific literacy in Columbia students. More than that, he laments their lack of what he calls "reality literacy." For evidence he cites the difficulty persuading a Columbia undergraduate that the moon is sometimes visible in the daytime. And others on a walk through Riverside Park didn't know what daffodils were. This galls Helfand all the more because of Columbia's high degree of selectivity, second only to Harvard (Columbia accepts only 8% of its applicants). He senses that students live in a world limited to their computers and iPods. While he feels that a majority of students used to attend Columbia for intellectual stimulation, he feels that a majority now attends merely to get their degrees.

These remarks set the scene for a Scientific Literacy Seminar presentation at the Columbia University Faculty House on 11 April 2006, in which Helfand described his efforts to include a science course in Columbia University's Core Curriculum, which dates back to 1919 and has been in effect ever since. In 2004 the Columbia faculty admitted "Frontiers of Science" into the Core Curriculum. Though opponents felt that the course should be a philosophy of science course *not* taught by a scientist, it is structured around four units of current science, which can change from year to year. Most recently, the topics were extrasolar planets, global climate change, biodiversity, and the use of MRI to measure behavior. The emphasis in the course is on the processes of science and "scientific habits of mind."

Before the faculty lectures are presented to students, they are presented to the other faculty in the course twice. They are available on-line as well as "live." Also available on-line are related readings, "how" links for students needing extra help, and "why" links for more advanced students. One such link, , allows students to listen to Beethoven's Ninth Symphony with sounds within only one octave of the musical range -- as a way of representing the sampling of a signal with only one segment of the spectrum of electromagnetic radiation. Helfand has also written an on-line book, *Frontiers of Science: Scientific Habits of Mind*, to emphasize analytical tools like graphs and statistics.

The course has now completed the second year of what was set up as a five-year experiment. Helfand reported that it has yet to find its niche among the students, who have rated the lectures highly, the seminars even higher, but the overall course low. On the other hand, it has found favor among the faculty, who feel it has been a fulfilling experience. For one thing, Helfand reported, faculty presentation of lectures to each other prior to students has brought faculty together to discuss teaching.