Home
Academic Programs
Faculty & Research
Our School
News & Events
News Archive
2009
SEAS, Murray engineer solutions to global problems
2008
2007
2006
Calendars & Colloquia
Publications & Web
For the Media
In the Community
Administration

SEAS, Murray engineer solutions to global problems

December 01, 2009

Q&A with Dean Cherry A. Murray (Harvard Resource)

Cherry A. Murray was appointed dean of Harvard's School of Engineering and Applied Sciences (SEAS) on July 1. Previously, Murray served as principal associate director for science and technology at the Lawrence Livermore National Laboratory in California. Recently, Dean Murray spoke with the Resource about Harvard's niche in the engineering sciences, the "pipeline" problem facing female and minority scholars and the "cool things" being invented at SEAS.

Resource: How does SEAS differ from a school like MIT? What's Harvard's niche?

Cherry Murray: Our niche is engineering that's embedded in the whole culture of Harvard, including the Faculty of Arts and Sciences (FAS) and the professional schools. MIT has a much larger engineering faculty. The institution is far more focused on engineering. As someone who went there, I can tell you that MIT teaches engineers who are exposed to the humanities. At SEAS, we teach leaders who understand engineering in the context of the humanities, business and public policy, among other areas.

Resource: You've been a leader at the Lawrence Livermore and Bell laboratories, two legendary centers of innovation in science and technology. What drew you to Harvard and SEAS?

Murray: SEAS is a small school, but it exists within a university that has one of the world's great liberal arts colleges and also leading professional schools. That gives us the chance to address the most challenging global problems. For example, in order to do something about clean water for all of humanity, yes, technology is part of the solution but a very small part. Who legally owns the water? That's public policy and law. What's the impact on health? That's medicine and public health. Water is wrapped up in the history and culture of any society. That's social science. I could even bring in the Divinity School. There are also major companies betting that water is going to be a big business opportunity. That's the Business School. Harvard is one of the few places in the world where you can find the breadth and depth of knowledge to address all these issues.

Resource: There's been a lot of discussion at Harvard and at other academic institutions over the last few years about ways to increase the number of women scientists and engineers. In your experience, how can you best attract and retain students and faculty in these fields and fix the "pipeline" problem?

Murray: I think that things are getting better in the sciences and engineering. When I was working on my Ph.D., there were about 3 percent women in physics and not much difference in engineering. Today in SEAS, about 30 percent of our student body—undergraduates and graduate students—are women. That's a dramatic difference. It's above the threshold of being an underrepresented minority, which is about 20 percent. Now, you will point out that it should be 50 percent. But we're doing pretty well after only 30 years of really trying.

In terms of what more can be done, I think that people want to go where things are exciting and where they will be welcomed. If you create a culture that welcomes people with diverse backgrounds and opinions—still very rigorous and still expecting excellence—everybody does better.

I experienced this kind of environment when I arrived at Bell Labs in 1978. The vice president of research was Arno Penzias, a Nobel Prize–winning physicist who discovered the cause of cosmic blackbody radiation. He felt that people from every ethnic background and economic class should come to Bell Labs. Of course, they had to be excellent.

Penzias began programs to mentor underrepresented minorities and women. Students would come to Bell Labs for summer research experience after their sophomore year in college. Then, when they entered graduate school, they could apply for a full fellowship for five years. They would also get a mentor from Bell Labs.

At the 30th anniversary of this program, we invited as many alumni as we could find to a celebration. Of all the professors from underrepresented minorities in science or engineering in the U.S., two-thirds came through this program. It would be great, when I'm done as dean, if I could say that SEAS has had that kind of impact. Because we're at Harvard, I think it's possible.

Resource: You've only been dean for five months. Have you had a chance to think about the school's strategy and direction for the next three to five years?

Murray: Actually, I'm thinking 10 years, but in three to five years we'll tackle curriculum reform. We want to make engineering more inviting and draw undergraduates to a concentration that is rigorous and exciting. To do that, we need to make use of all of the University. So we are working with the Medical School, School of Public Health and teaching hospitals to develop a new, dedicated Ph.D. program in bioengineering. It also makes sense for us to further develop environmental engineering, a field that intersects with global health and also involves public policy. That means getting the Kennedy School involved. Harvard College students are brilliant, and they want to have an impact on the world. That's where Harvard has a very powerful niche in engineering. We can collaborate with other parts of the University to address many aspects of a problem, not just the technological ones.

Resource: At the SEAS "all-hands" meeting in October (intranet.seas.harvard.edu/administration/all-hands), you said that the school was in "good financial shape, but not flush" and that you did not anticipate layoffs this year. Can you talk about SEAS's funding structure and the reasons for its stability at a time of financial crisis?

Murray: We're in reasonable shape. My predecessors built up a reserve, which cushioned things considerably, and some current-use gifts have served as a buffer. Some staff took the voluntary early retirement package, but we didn't have layoffs, and we are not expecting any this year. We looked at non-people expenses and cut those by 15 percent.

Resource: You not only requested proposals for community-building activities at SEAS, but also volunteered to fund them personally. Why is it so important to you to build relationships between staff, students and faculty at SEAS?

Murray: It's important that staff get to know the faculty and what they're doing. Faculty do outstanding research and teaching. We want the staff to take pride in that work because their job is to support the scholarship.

We have just set up a joint council of exempt and nonexempt staff, which is sponsoring "chalkboard talks" by the faculty and graduate students as well as tours of laboratories. This makes everybody work better. Our accountants understand why they're doing the purchasing, for example, so the faculty's work is supported better. The truth is that the faculty can't do what they do without that support.

Resource: What sort of research is going on at SEAS now? What's exciting?

Murray: Have you heard about the RoboBees Project? This is a cool thing. In 2006, there was a problem with colony collapse disorder, which was killing off a huge portion of the honeybee population in North America. About a third of the world's crops depend on bees for pollination.

A group of our faculty got together with biologists at FAS and Northeastern University and collaborated on a proposal to the National Science Foundation (NSF) to develop an artificial form of flying insects that would mimic bees and might one day even pollinate flowers. The proposal won an NSF Expeditions in Computing grant for about $10 million.

The project requires keen work and a multidisciplinary understanding of what is important to put in these robots. What should be in the brain of the robot? How do you conserve power so that when you're powering the wings, you can get some of the power back so that you don't wear out your battery? Since the robots are tiny, how do you actually make the electronics? How do you program the networking of the swarm? We have all these pieces, but bringing them together is a much larger whole and a really exciting project.

Resource: Is there a prototype?

Murray: There are prototype insects. Professor Rob Wood actually launched a robotic fly a few years ago. The project works here because we're so interdisciplinary. People actually talk to each other and bounce ideas around and collaborate. That's the kind of culture I want to foster.

Send this — Print this

Harvard School of Engineering and Applied Sciences
29 Oxford Street, Cambridge, MA 02138, USA