

Maglev Train Up and Running

Science fiction becomes reality this month as the first daily service of a passenger-carrying magnetic levitation transportation system becomes operational at Old Dominion University in Norfolk, Virginia. In Maglev trains, opposing magnetic fields generated by the train and track repel each other, keeping the train floating a few centimeters in the air and enabling it to reach speeds up to 476 km per hour, significantly faster than conventional trains. The technology has been around for awhile, but apart from several prototypes in Europe and Japan, Maglev trains have never left the drawing board due to their high construction costs compared to other forms of transportation.

The \$14 million Old Dominion system won't reach peak Maglev speeds. The 12-ton train will float along at 64 kph down a 1-km long elevated metal track, and will stop every few minutes at the university's dorms, parking garage, and student union. The engineering department will conduct research to see how efficient the system is and to test out new technologies on the track in conjunction with the company that built the train, American Maglev Technology, based in Edgewater, Florida, and Dominion Virginia Power, which subsidized the installation costs.

More than \$1.5 billion is spent each year in the US on low speed (slower than 80 kph) transit systems. Tony Morris, president of American Maglev Technology, says that Maglev

trains, and his company's in particular, can grab 30% of this market because the operating costs of the system are not steep. For example, the electric bill for the Old Dominion track is projected to be \$2 800 per month—less than the cost of diesel fuel used by the existing campus shuttle system.

The US project will not be alone for long. The first high-speed commercial Maglev train is scheduled to start up early next year in Shanghai, China. That \$1.37 billion system will connect the Shanghai airport with the city's financial district 30 km away. Similar trains are being considered for a 1300-km track between Shanghai and Beijing, and several projects are in the works in the US, including a 40-km link between Baltimore, Maryland, and Washington, DC.

PAUL GUINNESSY

Physics Bachelors at Work

A physics bachelor's degree is good preparation for lots of different careers. That claim is oft repeated within the physics community, but now the American Institute of Physics has data to prove it. The first in a series of reports based on AIP's pioneering survey of people several years after graduation came out in August and focuses on the roughly one-third of graduates who hold no additional degrees and are not primarily students.

Conducted in late 1998 and early 1999, the survey involved people who received a bachelor's degree in physics from one of 149 US colleges and universities five to eight years earlier—in the period 1991–93, during what was, the report notes, both a nationwide recession and a boom time for the IT industry.

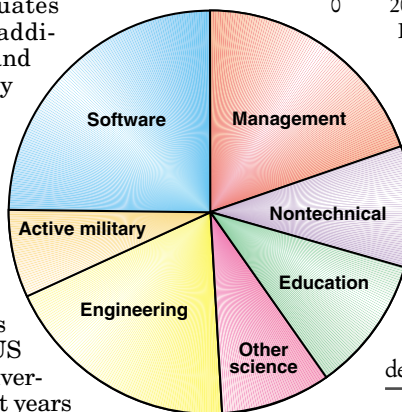
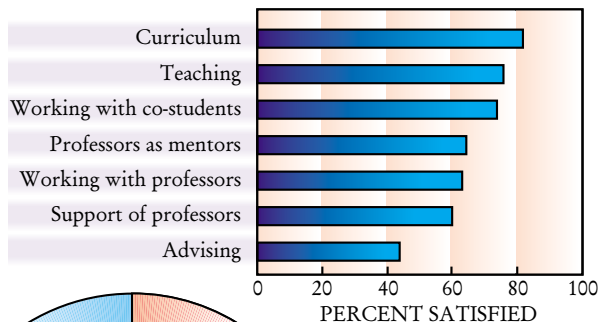
Of the 400 or so survey respondents whose highest degree is a bachelor's, 96% are employed, with 75% working in science-related jobs. The largest blocks are in software (24%), management (20%), and engineering

(19%). Physics bachelors also work, for example, as teachers, as lab technicians, and in the military. And some 10% of them hold nontechnical jobs for which no college degree is required.

The bulk of the working bachelors use their physics training in their current jobs. Most said that it had prepared them well for such things as scientific problem-solving. But they overwhelmingly reported that their education had not adequately prepared them in terms of teamwork, oral communication skills, or—in the case of those working in software—programming. Sixty percent said they would major in physics if they had it to do again.

Five to eight years after graduation, 60% of the physics bachelors continued to work in the same area as their first “career path” job—defined in the survey as “a job that will help you in your future career or a job in the field in which you want to make your career.” This, the report says, means that physics departments can play a potentially vital role in mentoring undergraduates through the process of landing their first real jobs.

These and other data are available in the *Early Careers of Physics Bach-*



DEGREES OF SATISFACTION: Five to eight years after graduation, physics bachelors who hold no additional degrees and are not primarily students work in many employment sectors (pie chart) and, looking back, say they are satisfied with various aspects of their degree programs (bar chart).



CHUCK THOMAS, OLD DOMINION UNIVERSITY

THE FIRST MAGLEV TRAIN, based on a decommissioned light rail car, is installed onto the track at Old Dominion University.

elors report. Single copies may be obtained free of charge from AIP, Statistical Research Center, One Physics Ellipse, College Park, MD 20740; e-mail stats@aip.org; Web <http://www.aip.org/statistics>. Reports analyzing the data from the same survey of 1991–93 graduates to glean insights into the effects of physics departments, gender,