

Roadblocks deter today's Einsteins

Please let me contribute a small drop to the ocean of responses that Lee Smolin's comments regarding "Why No 'New Einstein'?" (PHYSICS TODAY, November 2006, page 10; January 2006, page 13; June 2005, page 56) have apparently evoked. Rather than speaking in generalities, as in some of the published responses, I prefer to use the case-study method to make a stronger point.

The first case study is a student we'll call SJ. He and I had enrolled in a strong physics program in a large, prominent research university. SJ took the more advanced theoretical physics major and carried a heavy course load. His grades were so high that they were compiled separately from those of his classmates, in order to not unduly inflate the class averages. His professors even admitted to grading him harder than the other students. He won every available scholarship and had his choice of graduate schools. He chose a doctoral program at another prominent research university. I lost track of SJ until recently, when I found his graduate supervisor's webpage. SJ had been the first or second author of four papers during the first four years of his doctorate—and then he fell off the map. My e-mails to his graduate supervisor went unanswered. I suspect this brilliant student was told he would have to spend several years as a postdoc before even having a chance at an assistant professorship, and instead he simply gave up on pursuing that path. He probably now earns a six-figure salary as a financial analyst.

Then there was DP. Not as bright as SJ, he made up in diligence and creativity what he lacked in brilliance. He gained admittance to a master's and then a doctoral program at a less prominent, large, research-oriented univer-

sity. Despite having to support himself with part-time jobs, DP excelled in his doctorate, enjoyed the graduate experience, and produced six papers, most as a first author. He then became a postdoc in a well-funded laboratory associated with a famous research site. There he turned out five more papers in just three years—again, most as a first author. DP then looked for employment in physics, and received a single tentative offer, whose financing fell through. Disgusted, he left physics never to return.

Finally, let's consider KM, who graduated with high grades from a well-regarded Ivy League college. He won a nationwide theory contest, and so caught the eye of a well-funded theorist at the same university where SJ, DP, and I had been undergraduates. KM excelled in his graduate courses and took an interest in string theory. Unfortunately, he had a personality clash with his supervisor. KM's one remaining parent died of cancer, and his siblings moved away, married, and settled down. Orphaned, out of touch with his brothers and sisters, ignored by an indifferent supervisor, and seeing no end to his doctorate, this exceptional young man threw up his hands and quit.

I end my tale with the case that I know best—my own. While still a physics undergrad I saw the writing on the wall, in the form of employment ads in PHYSICS TODAY and similar publications, calling for assistant professorship candidates to submit five letters of recommendation from world-famous experts in the field. Being less proficient than SJ or KM, I moved over to a master's in physiology, a doctorate in sensory psychology, and then several years of postdoctoral work. Thinking that I had been much more canny than the others, I sought a professorship. But the joke was on me; I now possess more than 100 glowing letters of rejection. The 13 papers that I have produced apparently count for nothing; the glut of PhDs in psychology turned out to be second only to that in physics. I still read and attend conferences in my field, but only because I have a supportive, patient, and gainfully employed wife, who is doing the equivalent of two jobs.

For her I gladly cook, clean, and shop without complaint.

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If a new Einstein, with a revolutionary theory, were to suddenly appear in the 21st century as the old Einstein suddenly appeared in the early 20th, his or her paper would never see the light of day. Imagine it, a person with no PhD, no university affiliation, an unheard-of theory backed by equations constructed by that person alone, with no lab data to back it up?

Lee Smolin may be right that we are wasting our time on string theory, but in today's physics community only credentials and conformity count.

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Solar energy conversion can be small-scale and low-tech

The interesting feature article "Solar Energy Conversion" by George Crabtree and Nathan Lewis (PHYSICS TODAY, March 2007, page 37) devoted only two sentences to the simplest and cheapest form of solar conversion, the use of unconcentrated sunlight to "heat space and water in residential and commercial applications." Instead, the article focused on expensive high-tech applications not presently available, at least to the general public.

The immediate answer to the energy crisis is low-tech. Before President Harry Truman left office in 1953, he started a program to develop solar energy, but Dwight Eisenhower scuttled it. I remember attending an energy symposium in the early 1970s where the claim was made that solar energy would never be feasible because it would exhaust our water supply. President Jimmy Carter made a serious attempt to revive solar energy during the 1970s energy crisis, but he was

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