

## WHY NO 'NEW EINSTEIN' ?\*

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I am sure I am not the only one in this year of Einstein who receives calls from journalists asking, "Why is there no new Einstein?" While we have ready answers, there is still the disquieting worry that perhaps a lesson might be learned from the fact that this one person, who was initially unable to find an academic job, did more to advance physics than most of the rest of us put together have since.

Many of Einstein's contemporaries testified that he was not unusually talented mathematically. Instead, what enabled him to make such tremendous advances was a driving need to understand the logic of nature, tied to a breathtaking creativity and a fierce intellectual independence. But Einstein does not stand alone. One can cite many examples showing that big advances in physics come when unusually creative and intellectually independent individuals ask new questions and forge new directions.

It follows that new Einsteins are unlikely to be easily characterized in terms of research programs that have been well explored for decades. Instead a new Einstein will be developing his or her own research program that, by definition, will be one that no senior person works on. He or she may even feel the need to focus on the really deep and difficult questions, such as the foundations of quantum mechanics, that are ignored in leading American research institutes and departments, despite the work of a few leading physicists who had established their credentials in other topics first. After all, if Einstein himself felt the deepest problems were in the foundations of quantum theory, and if those problems remain unsolved

half a century later, why should we expect a new Einstein to ignore them ?

Over the past few years many have expressed concern about the challenge to US physics from growing investments abroad, from the European Union to China. I believe our future success in physics will depend on how well we can answer a single question : Are our universities, institutes, and foundations doing all they can to identify and promote individuals who have the creativity and intellectual independence that characterize those who contribute most to physics ? I say that they are not. They are not even doing as well as some of their competitors do to support those with the most creativity and independence. Simple changes could greatly improve the extent to which American science is hospitable to very talented physicists.

### ***Creativity and independence***

The mechanisms we have constructed to ensure fairness and quality have the unintended side effect of putting people of unusual creativity and independence at a disadvantage.

- Those who follow large well-supported research programs have lots of powerful senior scientists to promote their careers. Those who invent their own research programs usually lack such support and hence are often undervalued and underappreciated.
- People with the uncanny ability to ask new questions or recognize unexamined assumptions, or who are able to take ideas from one field and apply them to another, are often at a disadvantage when the goal is to hire the best person in a given well-established area.

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