

in which issues of sign or factors of 2 are tricky. The instructor can check that the student obtained the correct sign or factor at the correct point, rather than changed it at some arbitrary step, and thus grade accordingly. Substantial partial credit should be given for a calculation presented honestly with the wrong sign or factor and a 0 for the correct answer presented dishonestly. In addition to teaching our students physics, it is also valuable to teach them to correct those misunderstandings about what is proven and what is speculated that arise from different personality types.

Laughlin asserts that the recent frauds at Bell Labs "are noteworthy only because of Bell's special stature in American science and its reputation, both partly attributable to Bell's having been shielded from [economic] pressures by the old AT&T monopoly." I assert that it is noteworthy that, despite its immediate economic stress, the present Bell Labs did the right thing. That benefits Bell's long-term economic interest.

The private companies that hire Oregon State University students report that OSU's most important lesson is ethics.

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The frightening trend of industrializing our universities is, I believe, the single greatest threat to the integrity of higher education in this country (and probably all countries). The topic was hotly debated 30 or 40 years ago, but as the money has flowed, the concern seems to have waned. To better tap industrial largess and to appease state legislatures, university administrations have turned to the business model, which, as Laughlin so eloquently wrote, "is such a terrible idea."

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So pervasive are the contradictions in Robert Laughlin's disingenuous view of research in industrial laboratories that it is not easy to know where to begin the counterargument.

Having spent many years as a researcher and manager in an industrial laboratory, I came to understand that companies investing in basic research do not think of it as "charity

or part of an advertising budget." For a century, corporation-funded basic research has been a prolific driver of the technical revolution on which the world's economy is increasingly built, human health improved, and national security enhanced. Without these impacts, it would be hard to justify the large investments, by both government and industry, in both basic and applied science. And contrary to Laughlin's assertion, basic research continues to flourish in corporate laboratories where it is embedded in a balanced

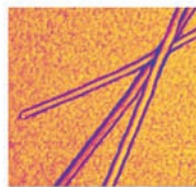
research portfolio and is highly valued by its corporate investor.

I discount Laughlin's assertion that "research linked to property has a built-in conflict of interest toward the truth" as being even less credible than it would be if "personal success and recognition" were substituted for "property." True, research is linked to property; something of economic value is created. However, it is patently false and contrary to experience that "intellectual property—knowledge that one can sell— . . . must be kept secret." Were it so, it

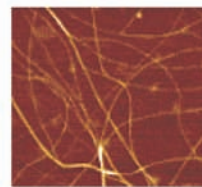
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