Options and choices

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In September 2018 my niece Miriam emailed me the first draft of the personal statement that she needed to submit with her UK university applications. She opened with a description of the aftermath of a food festival held in our hometown of Conwy. The plastic dishes, plates, bottles, cups, and cutlery that overfilled garbage cans and littered the town's streets shocked and appalled her. They also inspired her to develop new sustainable materials and sources of energy. This month Miriam takes a step toward that goal as she starts a bachelor's degree in natural sciences at Durham University.

In my 22 years at PHYSICS TODAY, I've acquired a broad overview of science, including energy and materials. I've interviewed hundreds of scientists about their research and about what motivates them. But if Miriam chooses not to pursue an academic career, I'm all but clueless when it comes to offering her career advice. What's more, as I recounted in my November 2018 editorial, in pursuing my own career in astronomy, I didn't actively seek or follow advice. Rather, I took the most attractive option that was in front of me.

This special issue is the first of what will become an annual series on careers. Its goal is to illuminate the options that physical scientists have and the choices they make. The focus of the inaugural issue is on education and early careers. Future ones will explore other aspects of careers, including career advancement and retirement.

Careers content kicks off on page 10, where you'll find Elizabeth Frank's commentary, "Lessons learned from leaving academia." After realizing during her postdoc that academic research was not for her, Frank joined an asteroid mining startup that subsequently failed. Now she's thriving as an applied planetary scientist—her term—at an engineering consultancy.

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"The road taken," which starts on page 32, is the Robert Frost–inspired title of Anne Marie Porter and Susan White's feature article. It summarizes the results of a recent survey conducted of physicists who had obtained their PhDs in the late 1990s and early 2000s. On the whole, survey respondents reported high job satisfaction and low job mobility.

In their feature article beginning on page 40, Crystal Bailey and Douglas Arion describe a movement by some physics professors to make innovation and entrepreneurship a vital component of the undergraduate physics curriculum. Even though few physics majors go on to found companies, all of them, Bailey and Arion contend, will benefit from learning the skills of a successful, socially minded entrepreneur.

Getting into graduate school is arguably when students commit to becoming physicists. Unfortunately, women and underrepresented minorities do not take that step in proportion to their numbers. In his feature article on page 50, Alexander Rudolph describes how Cal-Bridge, an alliance of community colleges and universities in California, is succeeding in tackling that problem.

The commentary and feature articles in this issue were written well in advance of the publication date. That's not the case for David Kramer's news report about Boeing on page 28. Kramer visited the aerospace company's offices in Seattle, where he interviewed some of the 90 physicists who work there. When I read the first draft, two things struck me. First was the variety of the work that Boeing's physicists do. Figuring out how to protect a composite fuselage from lightning and boosting the efficiency of robots on the factory floor are just two examples.

The second thing that struck me was the near-perfect resonance between the goals of teaching physics majors about innovation and entrepreneurship, as outlined by Bailey and Arion, and what Boeing's Minas Tanielian told Kramer: "Physicists are not as expert in terms of how to do some specialized things, but we understand the core of how things happen or interact with each other, especially in a multidisciplinary environment." PT