3. C. M. Hutchins, *J. Acoust. Soc. Am.* **73**, 1421 (1983).

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Physicists' real-world contributions

Rajan Menon's letter "Nobels neglect fluid dynamics" (PHYSICS TODAY, January 2021, page 10) correctly points out how the importance of physicists' real-world contributions have been undervalued in the physics community. Many physicists apparently have the misunderstanding that finding elementary forces among particles solves the world's problems. The reality is far from it.

Since Isaac Newton's time, it's been well known that the three-body system cannot be solved analytically, and numerical approaches can lead to chaos. The real world consists of infinitely many–body systems whose temporal evolution is intrinsically unsolvable. Even for the simplest hydrodynamics systems, the Navier–Stokes equation, which is only an approximate model, is not solvable. Plasmas are much more rich in their time evolution, and a large number of fundamental discoveries in that area have not been properly appreciated in the physics community. Some unexpected discoveries in nonlinear continuous media certainly deserve higher valuation in terms of their real-world contributions; conspicuous examples include the applications of optical solitons in high-speed transcontinental communications and the influence that self-organization of plasma turbulence has had on fusion confinement.

So far the only reliable universal law of physics in nonlinearly interacting many-body systems remains the second law of thermodynamics, which states that the entropy of an isolated system will not spontaneously decrease. That law's unique stature simply shows that a real physical system is unpredictable, so any new discoveries that go against the entropy law for at least a limited period of time deserve more attention. For example, in quasi-two-dimensional hydrodynamics systems, such as planetary atmospheres, a quantity called the enstrophy (the squared vorticity) is conserved in addition to the total energy, and the entropy can be defined with regard to either the uncertainty in the energy spectrum or the uncertainty in the enstrophy spectrum. The maximum-entropy state of enstrophy can lead to ordered structure in the energy spectrum and to nontrivial states such as zonal flows observed on the Jovian surface.

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Tales in tech transfer

I was pleased to see Toni Feder's piece in the February 2021 issue of PHYSICS TODAY on technology transfer (page 24). I have held tech transfer positions in industry and academia for more than 20 years. Tech transfer has been a very satisfying career for me. Moreover, it is a field that is particularly well suited to my background as an experimental physicist.

When speaking to physics students about my career, I like to tell the story of my time as a member of a team that included experienced engineers. We were fortunate enough to be inundated with projects across a broad spectrum of technologies. Although I was self-conscious about my lack of deep technical knowledge compared with my colleagues with traditional engineering backgrounds, I was very pleased to hear the way our boss would describe our team: "When we have a silicon invention, we give it to our silicon expert. When we have a photonics invention, we give it to our photonics expert. And when we don't have any expertise in an invention, we give it to our physicist."

I have found that the strong fundamentals and "outside the box" problem solving that I developed in my physics training have enabled me to come "up to speed" quickly across a broad range of inventions that run the gamut from nerve-regeneration devices to pollutant-capture technologies to high-performance concrete compositions and beyond. That flexibility is a vital skill for a tech transfer professional.

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Correction

May 2021, page 27—The building in the photo is erroneously identified as Cambridge University's Cavendish Laboratory. In fact, in Ernest Rutherford's day, the photographed building housed the department of engineering's Electrical Laboratory, which was later subsumed into the department of physical chemistry. Today the building houses the department of history and philosophy of science and the Whipple Museum of the History of Science. Below is the actual entrance to the Cavendish. (Photo by R. T. Phillips.) PT