Ginzburg had repeatedly stated that his career was driven by chance. We should all be grateful for the chance event of the KGB's denying Ginzburg access to classified documents, including his own reports, which caused him to switch from nuclear physics to superconductivity. His subsequent success earned him significant influence in the Russian scientific community: He led a famous scientific seminar that for 40 years attracted both experimentalists and theorists of diverse specializations. Ginzburg's dedication to science and his energy, sincerity, and benevolence make him a fine model for both young and seasoned scientists.

Lives in Science

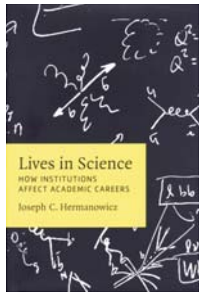
How Institutions Affect Academic Careers

Joseph C. Hermanowicz
U. Chicago Press, Chicago, 2009. $55.00 (323 pp.).
ISBN 978-0-226-32761-7

We all know someone like Sammie, who got a PhD in physics from Summa University and landed a faculty position at Elite University. But despite a productive career that featured several grants and early tenure, Sammie failed to meet the department's expectations for major awards and international recognition. Sammie's graduate-school classmate Bobbie settled on a position at North East State University, which emphasized teaching physics-to-nonmajors courses to keep the department afloat. Funding agencies rejected all but one of Bobbie's grant proposals. Apart from a few senior projects, Bobbie's research program faded away.

In reality, how common are those life histories? How satisfied are those physicists with their academic careers? How do career expectations change over time? And what role do universities play in shaping careers and physicists' perceptions of their careers? Those are questions addressed by sociologist Joseph Hermanowicz in *Lives in Science: How Institutions Affect Academic Careers*.

In 1994 Hermanowicz interviewed 60 physics faculty members (56 men and 4 women) at six PhD-granting universities in the US. The physicists were divided into early-career, midcareer, and late-career cohorts. In the National Research Council's (NRC's) assessment of graduate physics departments, two of the universities ("elites") were ranked near the top; one ("pluralist"), near the middle; and three ("communitarians"), near the bottom. The interviews and questionnaires collected from the six department chairs formed the basis of Hermanowicz's earlier book *The Stars Are Not Enough: Scientists—Their Passions and Professions* (University of Chicago Press, 1998). Ten years later the author reinterviewed 55 of the original cohort (one had died, and four—notably few—had changed institutions) to find out how their careers had changed over time and how those changes were shaped by the culture and expectations of their universities.



Lives in Science begins by laying out the sociological framework for the analysis. The rest of the book reports on the changes that have occurred in the careers of the 55 physics professors: Hermanowicz quotes freely from his interviews with the physicists, who speak frankly and often passionately about their careers. The reader will find several surprises. For example, the strongest dissatisfaction comes from some of the late-career elites. Although they like their institutions, they lament that they had not made a major—let alone revolutionary—impact in research and had not received the external recognition valued by their institutions and the physics community. As one elite physicist put it: "The dream is to discover some fantastic new effect that knocks the socks off my friends and colleagues. . . . I want my effect" (pages 86–87). Nonetheless, the elites state that they would make the same career choices again if given the chance to start over.

The pluralists express the most satisfaction. Many, after some initial discontent, have found a comfortable mix of teaching and research and realize that internal as well as external sources of recognition are important for their sense of personal satisfaction. The communitarians, at universities where teaching dominates over research, feel they have become disconnected from professional science as their careers have evolved. By midcareer their expectations have adjusted to meet the low research expectations and meager resources of their universities. Many of the communitarians state that they dislike their universities and would not choose an academic career if they could begin again. They look forward to a retirement in which they can pursue interests outside of science.

Why should the physics community be interested in what Hermanowicz has to say? There are several reasons. The life stories he presents are fascinating and often touching. Hermanowicz documents how the local university culture shapes a faculty member's expectations and sense of career satisfaction. But the most important lesson is that the science community's obsession with research as the sole reason for recognition and reward leads to frustration and dissatisfaction when reality fails to match expectations. And that, as sociologists would put it, "leads to anomie."

Can the physics community afford to lose the energy and passion of a large fraction of its highly trained talent? And how does a university that wants to advance in the NRC rankings elevate the career expectations of its faculty members who have been socialized to live with low expectations for research and do those characterizations hold for the 50% of physics faculty members who work at non-PhD-granting institutions that conduct some research? Hermanowicz does not provide all the answers, but in *Lives in Science* he forces us to think about these important questions.

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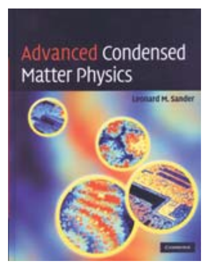
Advanced Condensed Matter Physics

Leonard M. Sander
Cambridge U. Press, New York, 2009. $80.00 (274 pp.).
ISBN 978-0-521-87290-4

The first problem any lecturer runs into when planning a graduate course in condensed-matter physics is finding a good textbook that covers both classical and modern topics at a sufficient level. Classics such as Neil Ashcroft and David Mermin's *Solid State Physics* (Brooks Cole, 1976) lack many of the modern topics because the field has naturally matured in the past three decades. In *Advanced Condensed Matter Physics*, Leonard Sander sets out to fill that gap. An experienced researcher in several condensed-matter subfields, Sander based the book on his lecture notes for a course he taught at the University of Michigan.



Other authors have attempted to replace the classics. Sander's offering is in direct competition with Michael Marder's *Condensed Matter Physics* (Wiley-Interscience, 2000) and Paul Chaikin and Tom Lubensky's *Principles of Condensed Matter Physics* (Cambridge University Press, 1995). Compared to those, Sander's text is considerably shorter. It covers more or less the same topics as Marder's, but not always in the same detail, and in particular with fewer illustrations and examples.

Advanced Condensed Matter Physics covers most of the appropriate topics for a graduate-level solid-state course, including crystals, surfaces, interacting and noninteracting electron gases, Bloch theory, dielectric properties, superfluidity, and superconductivity. Those standard topics receive a concise treatment. Sander's text also addresses more modern subjects; it contains, for example, a thorough discussion of the integer and fractional quantum Hall effects. However, some modern mesoscopic-physics developments, such as conductance quantization, are not mentioned.

Although Sander has aimed his book at the graduate student, I find the entrance level rather high. For example, a student using the book will need to have substantial knowledge of quantum theory. I like the book's approach of providing the physics background when it introduces new topics. But those introductions could have been more elaborate—or better yet, supplemented by more figures that could aid students who are new to such topics as Miller indices, elasticity theory, and reduced-zone schemes. The missing details and the often terse writing style also make the book less suitable for self-study. A successful course could certainly be based on this book, provided it is supplemented with pedagogic figures and explanations of some of the mathematical derivations. Another critique, though a minor one, is Sander's use of cgs units. Although such units are customary in solid-state books, they should be replaced by SI units, which are used in elementary courses on electromagnetism and quantum mechanics.

Overall, the book presents the appropriate topics for a graduate-level course in condensed-matter physics. Lecturers should be aware, however, that they might need to prepare supplementary material.

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Beyond Uncertainty

Heisenberg, Quantum Physics, and the Bomb

David C. Cassidy
Bellevue Literary Press, New York, 2009. $29.00 (480 pp.). ISBN 978-1934137130

Most physicists know 19th- and early 20th-century Germany as a fountainhead of science. And because we view science as the pinnacle of humanistic endeavors, we have looked to Germany as a pillar of humanism. Yet it was Germany that gave us Nazism, with all its worldwide bestial ties.

In *Beyond Uncertainty: Heisenberg, Quantum Physics, and the Bomb*, David Cassidy explores this dichotomy through his biography of a single man. Born into the German professorial class, Werner Heisenberg was a founder of quantum mechanics and a significant contributor to the physics of fluids and elementary particles. He refused many opportunities to join the flight of liberal academics from Adolf Hitler's pre-war Nazi Germany. Instead, he became head of Germany's wartime nuclear weapons research program even as he