ture from within the institutional and political contexts of the Cold War. The final part, "So What?," unpacks that myriad of human experiences and questions whether collaborative programs accomplished what they aimed to.

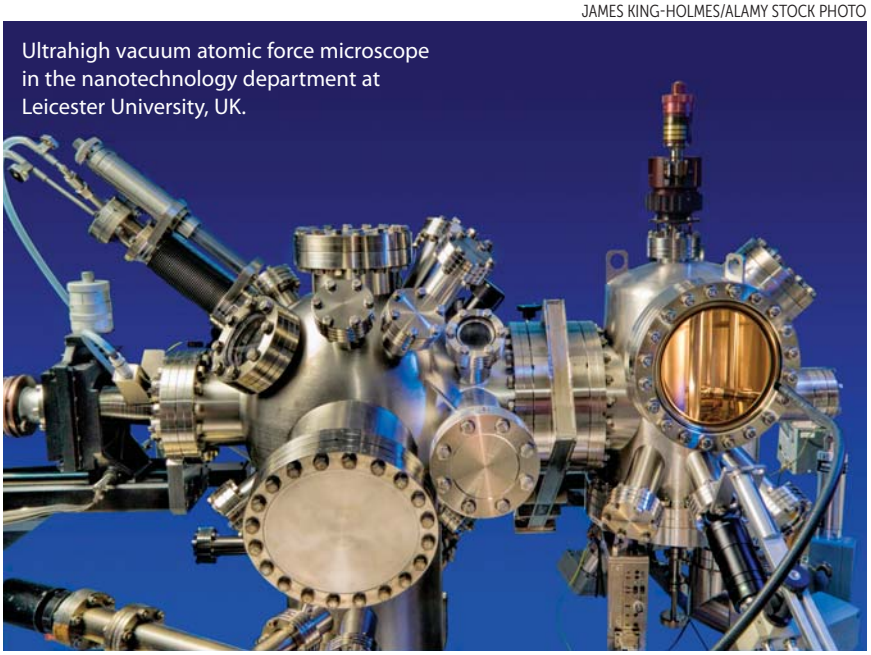
Some historians might take issue with the book's style, which is heavy on narration and lighter on analysis. Sher raises many interesting ideas and questions, but he does not present a clear argument. Instead, he starts the book with a series of rhetorical questions and says it will be "up to the reader" to draw their own conclusions from the testimony and facts offered. A skeptical reader might argue that the book has an inherently positive bias, since it highlights mainly the voices of people who dedicated their lives to collaboration or foreign service. Although Sher attempts to give a relatively balanced account and frequently addresses the many challenges and questionable motives involved in international scientific cooperation, there is certainly room for a less rosy interpretation of the events he covers.

But as Sher himself says, "Must we always be cold, hard-nosed realists, or may we also be driven by our vision of a better world?" In that sense, *From Pugwash to Putin* is a history not just of institutions and programs but of an ideal. Judged against that metric, the book is highly successful. Sher captures the human side of scientific exchanges while still giving appropriate attention to institutional and structural components. He is informed, experienced, and a natural storyteller whose style effortlessly infuses heart into what might have been dry policy analysis. The result is a stunning portrait of Cold War scientific cooperation, shining with the voices of those who sought to bring their ideals to life.

On the whole, historians of science have not addressed the impact of US support on science in former Soviet states after the union's collapse or how scientific exchange programs and agreements influenced the story. For that reason, *From Pugwash to Putin* is a book that needed to be written. It has enough substance to be useful to historians and political scientists, but it also has approachable language and vivid storytelling that will appeal to an educated lay audience. International scientific collaboration has become the norm as the world has grown more globalized, and *From Pugwash to Putin* will be of interest to anyone who wants to understand how the structures that facilitate international scientific collaboration came to be and how the Cold War's legacy affects science to this day.

Rebecca Charbonneau
University of Cambridge
Cambridge, UK

JAMES KING-HOLMES/ALAMY STOCK PHOTO



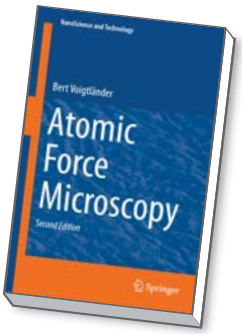
Ultrahigh vacuum atomic force microscope in the nanotechnology department at Leicester University, UK.

The inner workings of atomic force microscopy

More than 30 years after its invention, atomic force microscopy (AFM) has grown into a mainstream technique. It is employed in fields ranging from biology to material sciences and is a central tool of nanoscience. It applies to a huge range of samples and environments, from cryogenic to high temperatures and ultrahigh vacuum to liquids. The latest applications include not only the ability to produce topographic images from the several-micrometer range down to the atomic scale, but also the ability to map the physical—mechanical, electrical, chemical, and biological—properties of surfaces with unprecedented spatial resolution. Nowadays, commercial instruments enable researchers to quickly get images of their samples with a minimal knowledge of the operation principles. However, reaching the optimal image resolution or, more importantly, interpreting those images and property maps soundly requires a good understanding of how those instruments work. *Atomic Force Microscopy* by Bert Voigtländer covers those fundamentals.

Atomic Force Microscopy

Bert Voigtländer
Springer, 2019
(2nd ed.). $149.99



Atomic Force Microscopy aims to be a comprehensive text that covers most technical aspects of its subject, and it is written with graduate students and newcomers to the field in mind. In just over 300 pages and 18 chapters, it manages

to cover the most important aspects of AFM to help readers understand the practical and theoretical concepts behind it. Because of the complexity of the apparatus, the book tackles many practical engineering problems shared between instrumentation and nanoscience, including piezoelectricity, lock-in amplifier detection, motorized positioners and scanners, and vibration isolation.

The quest for exhaustivity and completeness also led Voigtländer to include some basic concepts in the first third of the book, which covers harmonic oscillators, Fourier transforms, and analog and digital electronics. More advanced readers may want to skip those early chapters. They may also want the chapter on linearized dynamic modes to get to the point more quickly and assume more mathematical background knowledge. However, advanced undergraduate students and scientists not familiar with physics will certainly appreciate the slower progression.

The other two-thirds of the book presents necessary background information about force-scanning microscopy and meticulously discusses the most commonly used operation modes of AFM, from static contact to dynamic frequency modulation AFM. *Atomic Force Microscopy* covers most of today's technology fairly and realistically, which is valuable when marketing from manufacturers often oversells the features and capabilities of their instruments. The theoretical content is rigorous and pedagogically effective, giving readers a broad and deep understanding of the subject. Each chapter contains a solid bibliography to guide further learning.

Readers hoping to study a single application of AFM can certainly focus their attention on selected chapters. However, they will probably miss out on pertinent information provided by the frequent comparisons of different modes, with pros and cons of each mode depending on operating conditions. I suggest that, instead, readers complete an initial reading (perhaps skipping the basic first chapters and the more technical final chapters) and then keep the book at hand as a reference work. That advice may seem daunting for newcomers given the book's length, but a more comprehensive reading is certainly worth the time for anyone planning to use the technique regularly. It will also be helpful for anyone wanting to dig further into the specialized literature. For a shorter and lighter introduction with less emphasis on equations, readers may turn to *Atomic Force Microscopy* by Peter Eaton and Paul West (2010).

Whether readers are just starting in the field or running an atomic force microscope daily, Voigtländer's *Atomic Force Microscopy* will be an excellent companion. It will usefully complement the user manual or the application notes of any instrument. I wish it had been available when I was beginning my journey in nanoscience instrumentation 15 years ago, and I will certainly use it as a reference book for all the students coming through our laboratory's door from now on.

Ludovic Bellon
Université de Lyon, École Normale Supérieure de Lyon, and CNRS
France

NEW BOOKS & MEDIA

Georgia's Terrific, Colorific Experiment

Zoe Persico
Running Press Kids, 2019. $17.99

In this book aimed at elementary school students, budding scientist Georgia clashes with her family of artists when they urge her to get creative with her experiments. "Science is about proper calculations and not silly imaginative ideas!" she scolds them. But when Georgia hits a roadblock, she looks to a color wheel to inspire her next experiment. The book sends a lovely message about the value of both science and art, and Zoe Persico's stunning illustrations enhance the appeal. —MB

Science Mom

Jenny Ballif, host
YouTube, 2016–present

Which things conduct electricity and why, how to build a strong math foundation, and what extraordinary properties water has are just a few of the topics tackled by molecular biologist Jenny Ballif on her YouTube channel *Science Mom*. According to Ballif, her inspiration sprang from the weekly science demonstrations she started doing for her son's second-grade class. The kids began calling her "Science Mom" and the name stuck, she says. Aimed primarily at the elementary school level, the weekly videos are billed as "engaging science activities for kids of all ages." —CC

Ologies

Alie Ward, 2017–present

Humorist and science communicator Alie Ward sits down with a wide range of experts to talk about how they became obsessed with their subjects in this engaging interview podcast. Ward is a funny, high-energy host, and her interviews are detailed and accessible. Recent guests have included cryoseismologist Celeste Labedz, psychologist Joseph Ferrari, and neurobiologist Crystal Dilworth. —MB