

BOOKS

Brookhaven: A Jewel in the Crown

Making Physics: A Biography of Brookhaven National Laboratory, 1946–1972

▶ Robert P. Crease
U. Chicago P., Chicago, 1999.
434 pp. \$38.00 hc
ISBN 0-226-12017-1

Reviewed by Robert W. Seidel

Robert Crease has written a useful and insightful history of Brookhaven National Laboratory, one of the crown jewels in America's scientific enterprise. Although he modestly eschews the role of the historian, preferring "biography" in the book's subtitle, Crease provides what is likely to be the definitive history of Brookhaven's first quarter-century. He brings the institution to life through vignettes of the lab's leading scientists, its extraordinary equipment, and its accomplishments in high-energy physics, solid-state physics, reactor development, and biology and medicine.

Crease is well placed to tell this story, since he has served as historian half-time at Brookhaven while teaching philosophy at the State University of New York, Stony Brook. In assembling his tale, he has made good use of the archives and of interviews with laboratory luminaries. Some of the lab's founders are now dead, but it is a tribute to Crease's skill that he is able to capture their voices.

The focus of the study is neither institutional nor scientific history, although Crease is sufficiently conversant with both to provide intelligible accounts of significant issues. His descriptions of Brookhaven's reactors, accelerators, computers, and detectors are succinct but sufficient to signal the importance of the machines and their products. His accounts of such important Brookhaven discoveries as strong focusing and the second neutrino are clear and will be

comprehensible to the lay reader.

A multipurpose national laboratory challenges description, because it pursues many activities that are simultaneously distinct and related to the nature of the institution. Crease's account is effective in putting these activities into a larger institutional perspective, while still acknowledging the individual style and contributions of those who led the lab's scientific programs. He does not hesitate to point out shortcomings in performance or differences in style, although his treatment of such lapses is sympathetic.

If he is less attentive to some of Brookhaven's rivals, in particular Lawrence Berkeley National Laboratory, it must be acknowledged that his biases reflect those of his subjects, scientists who sought to define themselves and their institution in contrast to more established centers of nuclear physics. When it comes to the institutional fortunes of Brookhaven, however, he is able to transcend the rather short-sighted perspectives of physicists and others who dismiss public relations and popular fear of their activities as unnecessary to the pursuit of science.

The Atomic Energy Commission and the contractors it imposed upon the laboratory receive the lion's share of blame for cost and schedule overruns on the reactors and accelerators built at Brookhaven in the decade following World War II. By insisting that these machines be built by contractors rather than the laboratory, Crease writes, the commission fostered an "awkward triumvirate management arrangement between the AEC, the lab, and the contractor. Lab scientists supposed that [the contractor] had matters in hand, [the contractor] thought the scientists were getting what they wanted, and the AEC assumed that any necessary interaction was taking place." Obviously, what we have here is a failure to communicate.

The lack of communication between Associated Universities Incorporated, which manages Brookhaven, and the laboratory, its patrons in the Atomic Energy Commission, Energy Research and Development Administration and the Department of Energy, and other constituencies, includ-

ing local taxpayers, reflected more than the isolation of the laboratory. There was, especially in the latter part of the period covered by Crease, a disdain on the part of Brookhaven's administrators for the political activity required to insure the continuance of good will. The ultimate denouement—the Department of Energy's 1997 cancellation of AUI's contract to run the laboratory—in the face of outrage over environmental pollution and declining support for the kind of big science Brookhaven had come to represent—repaid the hubris of its leaders with the halts of regulation and reform. Crease alludes to the roots of this tragedy in his account of the laboratory's early years. It is to be hoped that an equally detailed analysis of Brookhaven's history since 1972 is forthcoming.

Active Galactic Nuclei: From the Central Black Hole to the Galactic Environment

▶ Julian H. Krolik
Princeton U. P., Princeton, N.J.,
1999. 598 pp. \$99.50 hc
(\$39.50 pb) ISBN 0-691-01152-
4 hc (0-691-01151-6 pb)

Julian Krolik has written a textbook about AGN (active galactic nuclei) that really does take the reader from the tumultuous environment that likely surrounds an "active" black hole to that hole's galactic environment. The book focuses on processes believed to occur in the vicinity of a black hole that is accreting matter, and the observational consequences of these processes. The book, which is quite thorough, also covers observed properties of AGN over a broad range of wavelength and redshift.

The level of the material makes the book accessible to graduate or advanced undergraduate students of physics and astronomy. The text includes analytic arguments and derivations as well as detailed verbal descriptions of the processes themselves and related solar and galactic processes. The references and comparisons to currently debated topics

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