

History of Physics

NEWSLETTER

A FORUM OF THE AMERICAN PHYSICAL SOCIETY • VOLUME X • NO. 6 • SPRING 2009

Stephen Brush Awarded the 2009 Pais Prize

By Paul Halpern, Chair, Pais Prize Selection Committee

The American Physical Society and the American Institute of Physics have selected Stephen G. Brush, a physicist and historian of science, to receive the 2009 Abraham Pais Prize for the History of Physics “for his pioneering, in-depth studies in the history of nineteenth and twentieth-century physics.”

Brush joins an impressive list of previous Pais Prize winners including Martin J. Klein (2005), John L. Heilbron (2006), Max Jammer (2007), and Gerald Holton (2008).

Born on 12 February 1935 in Bangor, Maine, Brush received a bachelor’s degree in physics from Harvard University in 1955. A Rhodes Scholar, he pursued graduate study at Oxford University, earning a doctorate in theoretical physics in 1958. From 1959 to 1965, he worked as a researcher at the Lawrence Radiation Laboratory in Livermore, California, where he studied plasmas using Monte Carlo simulations and explored theories of viscosity. His discovery, using early computer simulations, that classical plasmas undergo phase transitions to solid states proved important for models of stellar and planetary structure.

Brush’s interests soon turned to the history of science. He wrote a comprehensive history of molecular-lattice models in statistical physics, tracing their origins back to the work of Wilhelm Lenz and Ernst Ising in the 1920s. Entitled “History of the Lenz-Ising Model,” his often-cited paper was published in *Reviews of Modern Physics*.

In the mid-1960s, Brush participated in developing the “Harvard Project Physics” course, in a program led by Holton, F. James Rutherford, and Fletcher Watson that was funded by the National Science Foundation and several private foundations. Designed for high-school students, this innovative curriculum used books, films, demonstrations and other materials to weave history and philosophy into the framework of physics education.

In 1968 Brush joined the faculty of the University of Maryland, where he was appointed Associate Professor in



2009 Pais Prize winner Stephen Brush of the University of Maryland.

the History Department as well as at the Institute for Fluid Dynamics and Applied Mathematics (later the Institute for Physical Science and Technology). The University’s first full-time historian of science, he became Professor in 1971 and Distinguished Professor of the History of Science in 1995.

In 1999 Brush was awarded a Guggenheim Fellowship for a research project titled “A comparative study of theory evaluation in different sciences.” Using case studies from astronomy, biology, chemistry and physics, he examined the standard assumption that scientific theories are accepted as a result of their successful prediction of new phenomena. On the contrary, he found, several important theories (such as quantum mechanics)

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Report from the Chair:

Preserving the Present

By David Cassidy, Forum Chair

Joseph Anderson and his colleagues at the AIP Center for History of Physics have recently completed the first systematic study of the contemporary history of physicists in industry. The project studied research at 15 science-based companies with the aim of developing guidelines for preserving historically valuable contemporary R&D records. The companies surveyed, including Raytheon, IBM, Bell Laboratories, and Xerox, varied widely in their practices. Although all dutifully preserved their financial records, their research records received much less attention.

The problem is not unique to the history of industrial research. Not just documents, but history itself, are consequently lost. Although the past

may be an influential prologue to the present, it exists today only in the fading memories of the participants and the scattered artifacts and documents—the forensic evidence of an era—that have survived to the present. But as memories fade, the evidence of the past is fading even faster. The reliance on email, computer files, and digital data acquisition and storage means that documentation of the daily workings of research is easily deleted, written over, or rendered unreadable as storage formats change. Paper takes up so much space that it can eventually become unmanageable. Digital electronics has altered even the nature of research. The AIP report issued by the Center laments the decline of the lab notebook and the absence of any electronic replacement for it.

No doubt future historians, too, will have to modify the methods of their work. But they will still need the evidence of the past, in whatever form that evidence might take. I concur with the report's recommendation that, at minimum, "A small number of records that document the R&D process and policies should be saved permanently and preserved either by the company or in cooperation with external archives."

The same holds for research groups in universities and many other institutions. Forum Executive Committee members George Zimmerman and Robert Arns have been actively continuing the Forum initiative begun by David Jackson to encourage academic physics departments to preserve their histories and historically valuable documents (See "Preserving Departmental Histories," *History of Physics Newsletter*, Fall 2008, p. 4). I am pleased to report that, in concert with the AIP Center, they have recently expanded the initiative to include industrial research facilities. For more information about these efforts, please contact Zimmerman (goz@bu.edu), Arns (Robert.Arn@uwm.edu), or Anderson (janderso@aip.org).

The 75-page AIP report, "History of

Physicists in Industry: Final Report," is available on the Web at http://www.aip.org/history/pubs/HOPI_Final_report.pdf. Print copies are available free by contacting chp@aip.org.

I wish to thank the Forum's Program Committee, led by Chair-Elect Gloria Lubkin and Vice Chair Daniel Kleppner, for their organization of the history sessions for the 2009 APS March Meeting (March 16–20 in Pittsburgh) and "April" Meeting (May 2–5 in Denver). You will find specifics about the planned sessions on pp. 4–6 of this issue. I hope you can attend one or both meetings.

We wish our budget allowed us to offer travel support to the speakers, especially the students, in our sessions. Please consider making a donation to the Forum to support a student who is presenting a contributed paper or to an invited speaker at one of these meetings. Such contributions may honor a physicist, or not, as the donor wishes. Contact Secretary-Treasurer Thomas Miller (millertf@bc.edu) or any other Forum officer for more information.

Congratulations to Stephen G. Brush, the 2009 winner of the Abraham Pais Prize for the History of Physics, and to Daniel Kennefick, who has been named an APS Fellow (see p. 3). I encourage you to nominate deserving colleagues for the Pais Prize and for APS fellowship through the Forum. More information on both distinctions can be found on the Forum website and on p. 6 of this issue. In addition, please encourage your historically inclined colleagues to join the Forum through membership in APS; members may join up to two APS forums at no additional cost.

Thanks are due Bill Evenson and the Nominating Committee for assembling our slate of candidates for the 2009 elections. We are especially pleased to have excellent candidates for the new Student Member of the Executive Committee. You will find

History of Physics

NEWSLETTER

The Forum on History of Physics of the American Physical Society publishes this Newsletter semiannually. Nonmembers who wish to receive the Newsletter should make a donation to the Forum of \$5 per year (+ \$3 additional for airmail). Each 3-year volume consists of six issues.

The articles in this issue represent the views of their authors and are not necessarily those of the Forum or APS.

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Daniel Kennefick Named APS Fellow

By Daniel Kleppner, Forum Vice Chair

The Forum on the History of Physics congratulates Daniel Kennefick on his appointment as a Fellow of the American Physical Society. He has been honored “for his enthusiastically reviewed book, *Traveling at the Speed of Thought: Einstein and the Quest for Gravitational Waves*, for his associate editorship of the Einstein papers—to which he brought the skills of physicist and historian—and for his articles, including the diligently researched ‘Einstein versus the *Physical Review*.’”

Kennefick’s interests and writings in the history of physics go back more than a decade to his Caltech doctoral dissertation, which had two parts: a physics thesis on radiation reaction in general relativity, and a historical thesis on the controversies in the history of the radiation-reaction problem. This unusual arrangement has typified his work in history. Most scientists pursuing historical work do so after a long career in research; Kennefick’s youthful combination of the two makes him stand out. His recent book, *Traveling at*

the Speed of Thought (Princeton, 2007) is a notable achievement resulting from his pursuit of history.

As an editor of the Einstein Papers Project (Princeton University Press), he helped to prepare four volumes of the Einstein papers, bringing his scientific and historical research skills to bear on these documents and doing research of the highest order. In this work he made good use of the archives of Howard P. Robertson at Caltech and those of John T. Tate at the University of Minnesota. His mining of these archives has shed light on a number of aspects of Einstein’s personality, culminating in a *Physics Today* article, “Einstein and Peer Review” (September 2005), which revealed that Einstein did not take kindly to referees, even when he was wrong.

Kennefick serves on the faculty of the University of Arkansas, where he continues to combine his interests in historical research with investigations in general relativity. As an editor of the Einstein Papers Project, now based at Caltech, he continues his work in

publishing the collected works of Einstein and in analyzing Einstein’s research papers from the 1920s and 1930s. In recent years, he has conducted extensive oral histories and a sociological study (including over 100 interviews) in the field of gravitational-wave physics, which is expected to inaugurate a new field of gravitational-wave astronomy.

Kennefick’s current research in general relativity and gravitational physics is focused on modeling gravitational waves generated by in-spiralling neutron stars and stellar-mass black holes into super-massive black holes, which probably exist in the centers of galaxies. He is a leading member of a working group of the Laser Interferometer Space Antenna, or LISA, a proposed mission to operate a gravitational-wave detector in space. This group provides theoretical input to the mission’s basic design parameters and specifications, and plans the data analysis. He is also principal investigator on a project planning a census of super-massive black holes in the Universe. ■

Editors’ Corner

This issue of *History of Physics* newsletter is my last as Editor. I have enjoyed and been stimulated by my involvement these past few years, but it’s time for me to pass the baton and move on. I plan to remain active on the newsletter for at least another year as Associate Editor, however, to ensure that a smooth hand-off occurs.

The next Editor, Dwight E. (“Ed”) Neuenschwander, brings impressive credentials to the job, having edited both *Radiations* magazine and *The SPS Observer* for the AIP Society of Physics Students. He will inevitably take the *History of Physics* in new directions. But I hope he will try to maintain—and improve on—some of my innovations, most notably the articles by and about Pais Prize winners. I hope you give him the same level of support and encouragement I have enjoyed.

This is also the first issue of the newsletter published primarily in electronic formats, as downloadable

PDF or viewable and printable HTML files on the Forum web site. In general, the Spring issue will be published electronically, while the Fall issue will be printed and mailed to all Forum members as before. Those wishing to receive a paper copy of the Spring issue by surface mail should send me an email (at mrriordan@ucsc.edu) including a name and street address, and I will add them to the list. By this once-a-year electronic publication, the Forum saves thousands of dollars that it can use instead to support other activities, such as subsidizing travel expenses for invited and student lecturers who otherwise could not afford to speak at our history sessions.

I hope this new publishing approach works well, and our members make the transition to reading about Forum activities in the history of physics online—at least once a year. The PDF version is an exact copy of what gets printed and mailed, so

members with access to the Web and a printer can easily make their own copies and read them weeks before they would eventually have arrived by third-class mail. The HTML version can accommodate more articles and photographs than we can ever include in a printed copy—and its total number of pages is not limited to a multiple of four. Ed Neuenschwander will likely take advantage of this flexibility to make the online newsletter even more interesting and successful than the paper edition.

The Executive Committee will be reviewing this experiment and may decide to publish the newsletter differently in future years. In making such an evaluation, Committee members will need feedback from the Forum membership, so please let your reactions be known. And for the rest of this year, at least, don’t hesitate to let me know them, too!

—Michael Riordan, Editor

Forum Invited Sessions at the March and "April" APS Meetings

By Gloria Lubkin, Forum Chair-Elect, and Daniel Kleppner, Vice Chair

The Program Committee has put together some varied and interesting invited sessions for the March and "April" APS Meetings this year. The March meeting occurs in Pittsburgh March 16–20, while the "April" meeting will be held May 2–5 in Denver.

At the March meeting, we will have three invited sessions. Two focus on the impact of highly influential and greatly admired theorists: Lev Davidovich Landau, who worked in the Soviet Union and created what is known as the Landau School, and Philip Anderson—still active and publishing in his eighties. The third session deals with the origins of Silicon Valley, covering the period from 1910 through the 1960s.

At the "April" meeting, the Forum will have four invited sessions. We have organized sessions on the history of telescopes, accelerators (co-sponsored with the Division of Physics of Beams), and science policy (co-sponsored with the Forum on Physics and Society). In addition, a session on John Wheeler's legacy was organized by the Topical Group on Gravity and co-sponsored by the Forum. The history of telescopes session commemorates the 400th anniversary of the invention of the telescope. The session on science policy includes as speakers two former Presidential Science Advisers, John Gibbons and Neal Lane.

We urge Forum members to consider attending these meetings and include these sessions in their schedules—as well as the Forum's contributed sessions, which will occur at both meetings.

Invited Sessions at the March Meeting

Origins of Silicon Valley

Gloria Lubkin, Chair
Monday, 16 March 2009, 2:30–5:30 p.m.

Stewart Gillmor, *Wesleyan University*, "Prehistory of Silicon Valley, from 1910 to 1965"

David Leeson, *Stanford University*, "W. W. Hansen, Microwave Physics, and

Silicon Valley"

Michael Riordan, *University of California, Santa Cruz*, "From Bell Labs to Silicon Valley: A Saga of Technology Transfer, 1954–1961" (The John Bardeen Lecture)

James Gibbons, *Stanford University*, "The Origins and Development of the Silicon Valley Startup Model"

Centenary of Lev Landau

Gloria Lubkin, Chair
Wednesday, 18 March 2009
8:00–11:00 a.m.

Pierre Hohenberg, *New York University*, "Lev Landau: A View from the West"

Lev Pitaevskii, *University of Trento and Landau Institute, Moscow*, "Landau and Theory of Quantum Liquids"

Valery Pokrovsky, *Texas A&M University*, "Landau and Theory of Phase Transitions"

Igor Dzyaloshinskii, *University of California, Irvine*, "Landau and Feynman Diagrams"

Roald Sagdeev, *University of Maryland*, "Landau's Contributions to Applied Physics"

Fifty Years of Anderson Localization

David Thouless, Chair
Thursday, 19 March 2009
2:30–5:30 p.m.

David Thouless, *University of Washington*, "Anderson Localization in the Seventies and Beyond"

Robert Dynes, *University of California, San Diego*, "Tests of Localization in Metals and Semiconductors"

Mordechai Segev, *Technion-Israel Institute of Technology*, "Anderson Localization of Light"

Igor Lerner, *University of Birmingham*, "Anderson Localization and Mesoscopics"

Alain Aspect, *Institut d'Optique, Palaiseau*, "Direct Observation of Anderson Localization of Matter Waves in an Optical Disorder"

Invited Sessions at the "April" Meeting

The Legacy of John Wheeler

Stanley Whitcomb, Chair
(cosponsored with GGR)
Saturday, 2 May 2009,
10:45 a.m.–12:33 p.m.

Kenneth Ford, *American Institute of Physics, retired*, "John Wheeler, 1933–1959: Particles and Weapons"

Kip Thorne, *California Institute of Technology*, "John Wheeler, 1952–1976: Black Holes and Geometrodynamics"

Wojciech Zurek, *Los Alamos National Laboratory*, "John Wheeler, 1976–1996: Law Without Law and Quantum Information"

History of Telescopes

Daniel Kleppner, Chair
Saturday, 2 May 2009, 1:30–3:18 p.m.

Marvin Bolt, *Adler Planetarium*, "Through the Looking Glass: 400 Years of Optical Telescopes"

Christine Jones, *Center for Astrophysics, Harvard University*, "Black Holes, Dark Matter, and Dark Energy: Measuring the Invisible through X-Rays"

Paul Vanden Bout, *National Radio Astronomy Observatory*, "Radio Telescopes: A Technological Saga Sparked by Serendipity"

Science Policy: Yesterday, Today, and Tomorrow

Daniel Kleppner, Chair
(cosponsored with FPS)
Sunday, 3 May 2009, 8:30–10:18 a.m.

John Gibbons, *Assistant to the President for Science and Technology, 1993–1998*, "Lessons from Skating on Thin Ice: Office of Energy Conservation, Office of Technology Assessment, and Office of Science and Technology Policy"

Neal Lane, *Rice University*, "Civic Scientist Era"

Lewis Branscomb, *Kennedy School of Government, Harvard University*, "Science as a Model for Rational, Legitimate Government"

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Stephen Brush Awarded the Pais Prize

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became accepted for other reasons—for example, because they provided explanations of previously mysterious phenomena.

Brush has not shied away from provocative topics. In his 1974 paper, “Should the History of Science Be Rated X?” he examined issues involving the use of historical anecdote in teaching science. He wondered whether traditional presentations of scientists as objective, emotionless observers serving as the vanguard of progress contributed to public apprehensions about their role in modern life. Brush speculated that more realistic portrayals could improve popular appreciation and understanding of science. Indeed, his call for realism seems to have had an impact. Recent decades have witnessed a trend toward more nuanced biographies of scientists, depicting their personal struggles and doubts rather than just their triumphs and accomplishments.

The subjects of science education, science popularization, and the history of the introduction of scientific ideas have continued to serve as major

themes in Brush’s work. In 2001 he was awarded the Joseph Hazen Education Prize of the History of Science Society “in recognition of outstanding contributions to the teaching of the history of science.”

A prolific researcher and writer, Brush has published more than 320 works, including books, book chapters, and articles. He authored four noted monographs on the history of science. In 1976 he published *The Kind of Motion We Call Heat: A History of the Kinetic Theory of Gases in the 19th Century*, a two-volume historical study of statistical physics and the properties of gases. This innovative history used referee reports and other unconventional sources to cast light on questions about the development of the field. For this book, he received the prestigious Pfizer Award of the History of Science Society.

Brush’s other historical monographs include *The Temperature of History: Phases of Science and Culture in the 19th Century* (1978), *Statistical Physics and the Atomic Theory of Matter from Boyle and Newton to Landau and*

Onsager (1983), and *A History of Modern Planetary Physics*, a three-volume set published in 1996. He is also the editor, translator, or co-author of ten other books about physical science and its development. With Holton, Brush co-authored an influential textbook (a revised edition of an earlier Holton work) that incorporated historical themes, *Physics, the Human Adventure: From Copernicus to Einstein and Beyond*.

Among his many other achievements, Brush served as President of the History of Science Society in 1990–1991, and was the founding Editor of the “History of Physics” newsletter. A Fellow of the American Physical Society, he helped organize the Forum on the History of Physics and has served on the APS Council. He has been a visiting researcher or faculty member at the Institute for Advanced Study in Princeton, the University of California, Los Angeles, and the University of Minnesota. Upon retiring from the University of Maryland in 2006, he was named Distinguished University Professor Emeritus of the History of Science. ■

Report from the Chair

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candidate biographies and statements on pp. 7-11 of this issue. Please take a moment to review this information and vote in the election.

I am pleased to report that Forum Webmaster George Zimmerman, working with Sara Connors at APS, has now posted multimedia materials on the Web from our March and April 2008 program sessions. You may find them on the Forum website. (Under Announcements, go to “March 2008 FHP sponsored presentations” or “April 2008 presentations.” PDFs of the PowerPoint presentations as well as audio files can be downloaded there.) George will continue to post similar materials for future meetings. The Web posting of audiovisual materials from our sessions greatly enhances our services to the history of physics and vastly extends the exposure of speakers

in our sessions.

Spencer Weart recently retired as the Director of the AIP Center for History of Physics. In that capacity, Spencer was a valued addition to the Forum Executive Committee for many years. We are sorry to see him leave the committee, and we wish him all the best for the future. Gregory Good, a historian of science formerly at West Virginia University, stepped in as Director on January 1. We welcome him warmly as the Center’s new ex-officio Executive Committee member.

The Forum’s semi-annual “History of Physics” newsletter will continue to be published online twice per year, but because of financial limitations a paper edition will be printed and mailed to members only once per year—usually in the fall. The online version will be available in both PDF and HTML

formats at <http://www.aps.org/units/fhp/newsletters/index.cfm>.

The PDF version, which is an exact copy of what the paper edition would look like in print, can be downloaded and printed. The HTML version has additional articles and photos that cannot be accommodated in the other versions. It can be printed, article by article, or viewed online by those comfortable with doing so. Editor Michael Riordan welcomes your comments by email (at mriordan@ucsc.edu).

Finally, I would like to thank all of the members of the Executive Committee, as well as the chairs and members of our various committees and program activities, for their hard work in making our programs and initiatives a success. And I would like to thank Forum members for your support of the history of physics. ■

Call for Nominations:

Nominations for APS Fellowships

The Fellowship Committee calls for the nomination of candidates for APS Fellow through the Forum on the History of Physics. These nominations should be based at least in part upon achievements related to the history and philosophy of physics. The Forum deadline for the receipt of all materials at APS is 15 May 2009. Procedures for nomination have recently changed. The new procedures are now available at:

<http://www.aps.org/programs/honors/fellowships/index.cfm>
(click on "Nomination Instructions").

According to these procedures, all nominations should be submitted to the APS via the online nomination package provided at the indicated web site. The nominees must be APS members in good standing, which may be confirmed through the above website. A sponsor (nominator) and a co-sponsor, both of whom must be APS members, are required. Up to two supporting letters from other individuals, who do not have to be APS members, may be also submitted by uploading to the site. Please visit the above web site for further information and to obtain a list of the documentation required.

Nominations will be forwarded to the Forum Fellowship Committee for review. This committee will make its recommendation to the Forum Executive Committee, and after that all nominations will go to the APS Council for approval. Fellowship nominations may be submitted at any time, but must be received by 15 May 2009 for the next review.

For further information, please contact the chair of the Forum Fellowship Committee, Daniel Kleppner at kleppner@mit.edu, or the APS fellowship officer at fellowship@aps.org or by telephone at (301) 209-3268. ■

The Abraham Pais Prize for the History of Physics

The Forum on the History of Physics calls for the nomination of candidates for the 2010 Abraham Pais Prize for the History of Physics, the purpose of which is to recognize outstanding scholarly achievements in the history of physics. This Prize is sponsored jointly by the American Physical Society and the American Institute of Physics. Awarded annually since 2005, it includes \$10,000 and a certificate citing the contributions of each recipient (as many as three), plus an allowance for travel to an APS meeting to receive the prize and deliver an invited lecture on the history of physics. Past Prize winners are Martin J. Klein (2005), John L. Heilbron (2006), Max Jammer (2007), Gerald Holton (2008), and Stephen G. Brush (2009).

A nomination for the Pais Prize should consist of:

- a letter of 1,000 words or less evaluating the nominee's qualifications, in light of the Rules and Eligibility for the Prize (see <http://www.aps.org/programs/honors/prizes/pais.cfm>), and identifying the scholarly and professional achievements to be recognized; as there is no official nomination form, this letter will constitute the formal nomination.
- a list of the nominee's most important publications; reprints of up to five of the nominee's articles may be included.
- at least two but not more than four seconding letters.
- an (optional) biographical sketch.

Five copies of the complete nomination package should be mailed to the Chair of the Selection Committee:

Professor Laurie Brown
1500 Hinman Avenue #402
Evanston, IL 60201

The deadline for receipt of all materials is 1 May 2009. After three consecutive review cycles that do not result in a nominee being selected for the Prize, a new, updated nomination package must be submitted for the nominee to be considered again. ■

Nominations for Forum Councilor

At its annual meeting on 3 May 2009, the Executive Committee will nominate at least two candidates for the position of Forum Councilor. Once elected, this person will represent the Forum on the APS Council in a four-year term to begin in January 2010. Forum members are asked to send suggestions for candidates for the this office to the Secretary-Treasurer Thomas Miller at millertf@bc.edu, or by surface mail to:

Thomas Miller
AFRL/RVBXT
29 Randolph Road
Hanscom AFB, MA 01731-3010

If more than 5 percent of the Forum members (or about 200) suggest the same person, that candidate will automatically appear on the ballot in addition to any nominations made by the Executive Committee. ■

Forum Invited Sessions

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History of MURA, Fermilab, and the SSC

Gloria Lubkin, Chair
(cosponsored with DPB)
Monday, 4 May 2009, 3:30–5:18 p.m.

Lawrence Jones, *University of Michigan*, "Innovation Was Not Enough: The History of the Midwestern Universities Research Association"

Adrienne Kolb, *Fermi National Accelerator Laboratory*, "Fermilab: The Ring of the Frontier, 1967–1995"

Stanley Wojcicki, *Stanford University*, "A Personal Recollection of the SSC's Birth and Demise"

More details on these sessions, including some abstracts of papers can be found on the Web at:

<http://www.aps.org/meetings/march/index.cfm>
<http://www.aps.org/meetings/april/index.cfm>

These sessions will be audiotaped and the recordings placed on the Forum web site, with PowerPoint presentations where available. ■

Forum Elections: Candidate Biographies and Statements

The Nominating Committee of the Forum on History of Physics has chosen a slate of candidates for the 2009 elections. You will soon be asked to vote for Forum Vice Chair and two at-large members of the Executive Committee. One of the at-large positions provides, for the first time within the Forum, representation specifically for current or recent students, who constitute about 25 percent of the Forum membership. The person elected to be Vice Chair will become the new Chair-Elect in 2010 and Chair of the Forum in 2011. The primary responsibilities of the Vice Chair and Chair-Elect are to decide upon timely topics for invited and contributed sessions at APS and divisional meetings, often in collaboration with other forums, and to arrange these along with sessions of contributed papers.

If you have an email address registered with APS, you will receive a message inviting you to vote electronically. If you do not have an email address, you should receive a paper ballot by mail. If you want a paper ballot but have not yet received one, please either email your request to the Secretary-Treasurer, Tom Miller (millertf@bc.edu) or contact him postally (Boston College Institute for Scientific Research, Air Force Research Laboratory/RVBXT, Hanscom AFB, MA 01731-3010) or by telephone (781-377-5031).

The closing date for this election is 29 March 2009. Please vote!

Candidates for Vice Chair

Martin Blume

American Physical Society and Brookhaven National Laboratory
Email: blume@aps.org

Biography: Martin Blume is Editor-in-Chief Emeritus of the American Physical Society and Senior Physicist Emeritus at Brookhaven National Laboratory. He received his A.B. degree from Princeton in 1954 and a Ph.D. in physics from Harvard in 1959. He was a Fulbright Fellow at Tokyo University in 1959–1960, and Research Associate at the Atomic Energy Research Establishment at Harwell, UK, in 1960–1962.

In 1962 he came to Brookhaven, where his research centered on condensed matter theory, particularly on the theory of magnetism, phase transitions, neutron scattering, and synchrotron radiation. He held many research and management positions at Brookhaven, including head of condensed-matter theory, Deputy Chair of the Physics Department, Chair of the National Synchrotron Light Source Department, and Deputy Director of the Laboratory. In addition he was Professor of Physics at Stony Brook University from 1972 to 1980. In 1996 Blume took a leave of absence from Brookhaven to become Editor-in-Chief of the APS, with responsibility for all the Society's journals. He served two five-year terms as Editor-in-Chief, retiring in March of 2007. During this period he oversaw the transition of the *Physical Review* to electronic distribution, including putting all the journals on-line, back to the origins of *Physical Review* in 1893, and reworking the operation of the editorial process to completely electronic form, with a virtually paperless office.

Blume received the 1981 E. O. Lawrence Award in Physics of the Department of Energy for his research on Neutron Scattering and Synchrotron Radiation, and the Argonne National Laboratory Advanced Photon Source A. H. Compton Award for his theoretical research on resonant X-ray scattering in 2003. In 2005 he received from the Council of Science Editors their highest award for his innovations and accomplishments in scientific publication. He has served on many committees of the APS, including election to the Council and Executive Board as well as Chair of the Nominating Committee. He has served also on committees of the National Research Council, the National Science Foundation, the Department of Energy, the Institute of Pure and Applied Physics, and on many visiting committees of institutions around the world. He is a Fellow of the American Academy of Arts and Sciences, the American Physical Society, the American Association for the Advancement of Science, and the British Institute of Physics.

Statement: During the past year I have served as Editor of the Milestones of *Physical Review Letters*, in celebration of the 50th anniversary of *PRL*. This has involved, first, selecting for each year from 1958 to 2000, one or two significant developments that merit designation as worthy of doing honor to *PRL*. Then a brief writeup was given, to attract readers to look at the articles. It was important to try to give a balance to the many different areas of physics in this effort. This means that many very important developments were not selected, but it also shows the importance of *PRL*. This effort is now complete.

My interest and involvement in the history of physics goes back to my administrative positions at Brookhaven, which required justification for locating research efforts at national laboratories, and the history of the national laboratories provided such justification. My interest intensified during my terms as Editor-in-Chief: The on-line availability of all of the content of the APS journals is a treasure trove of historical information about both the Society and the physics of the 20th (and now 21st) century. During the 2005 celebration of the World Year of Physics, I gave a well-attended invited talk on "Scientific Publication Since Einstein" at the German Physical Society meeting in Berlin, where Einstein's involvement with the *Physical Review* was highlighted.

The often standing-room-only status of the Forum's invited sessions shows the great interest in the history of our science, and we should take advantage of this, first to increase membership, and then to arrange more such sessions at the smaller meetings of the Society, focusing on historical developments relevant to the location and topics of the meetings. Also important is the relationship between the history of physics and the policy, international, and educational programs of the Society. Joint sessions with the other forums in these areas should be promoted, and an aggressive campaign is needed to obtain more nominations for APS Fellowship through the Forum, separately and with other APS divisions.

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Biographies and Statements

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George O. Zimmerman

Boston University

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Biography: George O. Zimmerman received all his degrees from Yale University. His Ph.D., with H. E. Fairbank and C. T. Lane on the low-temperature properties of helium-3, was completed in 1963. (His initial bout with experimental physics was scanning nuclear emulsions from the Brookhaven Cosmotron at a time when mesons were being discovered.) That year he joined the faculty of the Boston University Physics Department, from which he retired in 2000. His research interests are in condensed-matter and solid-state physics. More specifically, they involve low-temperature properties of helium-3 and paramagnetic systems, phase transitions and critical points, superconductivity and its applications, intercalated graphite, and theoretical studies of perovskite colossal magneto-resistive materials.

Zimmerman was Physics Department chair for 12 years (during which time a new physics building was constructed and the faculty doubled), chaired the Faculty Council (during the only strike in Boston University's history), and was a member and chair of several other influential university committees, such as the University Planning Committee and the Computer Facilities and Research Board. His research collaborations included the Francis Bitter National Magnet Laboratory at MIT, Brookhaven, UC San Diego, Leiden, and Harvard. He is still active in research and writing. A summer research internship program for high-school students that he established over 30 years ago is still going strong. Students who complete physics in their junior year spend the summer in research laboratories at Boston University, Harvard and MIT. He is currently a Member-At-Large of the Forum Executive Committee and its *ad hoc* Webmaster.

Statement: History is worth preserving. Not only for historians but also for the professionals who can make use of ideas that were occasionally ahead of their time. I have seen many good

physicists being forgotten within a few years of retirement, even within their own departments.

We are at a point in time when a very productive generation of physicists, both in academia and industry, is about to retire or has retired, and its contributions are in danger of being lost. Many worthy contributors to the various fields of physics may be forgotten. Moreover much of what goes on in forums and talks at APS meetings is lost to memory because the proceedings are rarely recorded (other than through the abstracts). The context of the talks is lost as well. As Vice Chair, I will attempt to preserve history in a systematic and accessible manner. I will continue to collaborate with the AIP Niels Bohr Library and Archives in urging the writing of histories of physics departments and research laboratories so that they can be preserved. Recorded interviews of retiring or retired researchers should be part of the process. I will also continue to organize APS history sessions, which will include sponsored lecturers, where the younger generation of physicists (and astronomers) can learn about previously proposed ideas, developments, and the context in which these events occurred, told by the people who lived them and were contributors to those events. I will also continue to chronicle those sessions and publish them on the Web, as has already been done with some of the 2008 March and April Forum sessions. We should preserve our past for the future.

Candidates for 'Student' Member of the Executive Committee

Paul Cadden-Zimansky

Columbia University

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Biography: Paul Cadden-Zimansky received a B.A. from the Great Books program of St. John's College and an M.Sc. in history and philosophy of science from the London School of Economics. His master's thesis focused on how Max Planck's understanding of thermodynamic laws played a role in introducing the concept of inherent probabilities of microscopic events into the early quantum theory. After studying physics and mathematics at UC Berkeley and University of

Wisconsin, Madison, Cadden-Zimansky received his Ph.D. in experimental condensed matter physics from Northwestern University where he was a Presidential Fellow. His doctoral work, which included a research appointment at Argonne National Laboratory, involved novel manifestations of quantum coherence in superconducting nanostructures. Cadden-Zimansky currently holds a joint post-doctoral fellowship at Columbia University and the National High Magnetic Field Laboratory working with Philip Kim and Yong-Jie Wang on transport and infrared measurements of graphene. His historical interest at present focuses on the early development of quantum statistical mechanics.

Statement: As a physicist with a background in the history of science, the Forum newsletter and sponsored talks have provided me with an excellent way to stay in touch with my earlier academic passions. The work of the Forum has reinforced my views that physics history provides an invaluable pedagogical tool for introducing students to science, and can remind active researchers of important questions of the past that are still relevant today. Since the Forum has a dual mission to preserve and disseminate physics history, let me offer concrete proposals in each of these areas that I believe will help to continue its success in the future.

With physics, the history of physics, and the APS itself becoming more international, the Forum should make an active effort to promote scholarship on history outside the purview of North America and Western Europe. While the great majority of Forum members are rooted in this tradition, the increasing national diversity of physicists will require a proportional increase in studies on the history of physics in countries outside of these areas. A specific concern at present is the number of leading lights of Soviet physics whose recollections have yet to be preserved.

With regard to the dissemination of physics history, as more individuals pursue their interest in the subject online, it is imperative that the Forum website undergo continued

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improvements. The reformatting of the electronic version of the newsletter to mimic established online periodicals will make it more accessible, an important step now that the spring edition is to become entirely web-based. A number of APS events relevant to Forum members could be more prominently announced and documented on the website; the historic site dedications in particular are sometimes historic gatherings in their own right, and posting pictures of these gatherings will help to increase the number of images in the Forum gallery.

Josué Sznitman

Princeton University

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Biography: Josué Sznitman is a fluid dynamicist whose interests lie in experimental fluid mechanics at small scales and flow phenomena relevant to biology and physiology. Sznitman received his B.S. in mechanical engineering from MIT in 2002 and his Ph.D. in mechanical engineering in 2007 from the Swiss Federal Institute of Technology (ETH Zurich). His Ph.D. thesis focused on respiratory flows in the lungs in relation to the deposition of inhalation aerosols. For such work, he received the Silver Medal from the ETH Zurich and the Annual Award from the Swiss Society of Biomedical Engineering. After spending a year as a Postdoctoral fellow at the University of Pennsylvania during 2008, Sznitman recently joined Princeton University in 2009 as a Teaching Fellow appointed by the Princeton Council of Science & Technology. He has been an active member of APS and the Division of Fluid Dynamics since 2005. More recently, he received a John Bardeen Studentship to present a paper on the history of physics at the March Meeting in 2007.

Statement: One of the ways in which I strive to share my passion for science and history is through teaching. My experience has been that from early on physics taught in high school up until physics courses in university, scientific subjects are much too often taught by neglecting to include the history and life of the people who have contributed to the fields and to our knowledge. Indeed, scientific ideas and theories

that have surfaced throughout history are often intricately connected to scientists' and researchers' lives, personal experiences, and their contemporary times. In some sense, physics and its discoveries also reflect the complex stories of people. My desire, as a Forum member, is to place an emphasis on the pedagogy of teaching science, in particular to students coming from different backgrounds including non-scientific ones. I believe that the Forum's role can help to promote the appeal of physics to non-physics crowds through this social link with history.

Candidates for Member-at-Large of the Executive Committee

Cathryn Carson

University of California, Berkeley

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Biography: Cathryn Carson is Associate Professor of History and Director of the Office for History of Science and Technology at the University of California, Berkeley. She currently chairs the editorial board of *Historical Studies in the Natural Sciences* (formerly *Historical Studies in the Physical and Biological Sciences*). Her undergraduate training was in history of science, physics, and mathematics at the University of Chicago, and her Ph.D. was in history of science from Harvard University. Her past research has dealt with conceptual issues in quantum theory, relations between science and culture in twentieth-century Germany, and the institutional and political history of post-World War II physics. She is co-editor with David A. Hollinger of *Reappraising Oppenheimer: Centennial Studies and Reflections*, and her book *Heisenberg in the Atomic Age: Science and the Public Sphere* will be published later this year by Cambridge University Press. Her current research examines the history of the science behind nuclear waste management. Most years she teaches (and podcasts) an upper-level undergraduate course on the history of physics.

Statement: The history of physics is my full-time occupation. I teach it and I work in it actively. For physics education, I have learned, the history of physics can have real usefulness – as long as it is not just feeding students

stories of geniuses and breakthroughs, but helping them grasp the discipline's conceptual structure and sociopolitical context. At the same time, the history of physics, at least as historians practice it, has moved away from straightforward stories of unbroken advance. Although this sensibility sometimes grates on practicing physicists, I think it is a more realistic way of understanding the discipline's progress. As a member of the Forum executive committee I hope to work with other Forum participants to advance projects that cross the boundaries between physicists and historians. One critical effort is to encourage local ventures to preserve historical materials and memories. Another is to help generate support for institutionalized historical programs, such as the AIP Center for History of Physics and Niels Bohr Library.

Clayton A. Gearhart

St. John's University

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Biography: I am currently Professor of Physics at St. John's University in Minnesota. I did my undergraduate work at Rensselaer, and my graduate work at the University of Minnesota (Ph.D. 1979 on experimental liquid helium with William Zimmermann). I became interested in the history of science in my undergraduate years, and after leaving graduate school, began pursuing it as a research interest. That transition was aided when, in 1981, I had the good fortune to participate in a National Endowment for the Humanities summer seminar at Yale University, directed by Martin J. Klein. I have also benefited from the support and encouragement offered by the History of Science Program at the University of Minnesota. Currently, my research focuses on the history of thermodynamics, statistical mechanics, and early quantum theory. I am a long-time member of APS, American Association of Physics Teachers, the Forum (serving on the 2005–2006 Nominating Committee), and the History of Science Society.

Statement: The history of physics has much to offer physicists. Physics students are often surprised and

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Fermilab: Physics, the Frontier & Megascience

by Lillian Hoddeson, Adrienne W. Kolb and Catherine Westfall

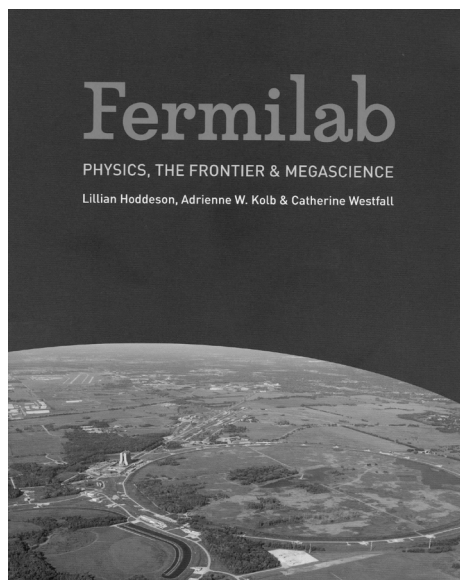
University of Chicago Press, 2008, photos and illustrations, 499+xiii pages, \$45.00

Reviewed by Robert P. Crease

The book *Fermilab: Physics, the Frontier, and Megascience* is a welcome addition to the growing literature on laboratories. It is the history of a laboratory that has been a key node in the US science network for close to four decades. The lab began life in 1967 as the National Accelerator Laboratory, or NAL, and in 1974 was renamed in honor of Enrico Fermi to become FNAL. Its centerpiece has always been a high-energy proton accelerator, starting with a 200 GeV fixed-target machine that switched on in 1970, followed by the Tevatron proton-proton collider, completed in 1987. The Tevatron will be the world's most powerful particle accelerator until CERN's Large Hadron Collider, or LHC, finally becomes fully operational later this year or next.

Laboratories are not neutral spaces but complex and organized productive institutions that must take extraordinary risks while adhering to the bottom line. When effective, they seem to remain in the background, providing flexible support for researchers in mounting experiments. Yet to stay effective, national labs must periodically reinvent themselves in response to changing scientific developments, government interests, and budgetary realities. The complex fabric of elements—of people, instruments, departments, funding agencies, political interests, collaborating institutions, and so forth—that must interact to achieve this end makes labs difficult to write about. Thus the writing of the laboratory history, even more than histories of other institutions, requires carefully thought-out framing principles.

Hoddeson is an award-winning professor of history at the University of Illinois at Urbana-Champaign, Kolb is the Fermilab archivist, and Catherine Westfall is visiting associate professor at Lyman Briggs College at Michigan State University and a historian of 20th century science. The authors announce



their framing principles in the book's subtitle: physics, the frontier, and megascience. They pick up the physics story at the beginning of the 1960s when the first alternating-gradient accelerators were completed, a development that incited the ambitions of physicists to soar to 1,000 GeV and beyond. At the time, two laboratories—Brookhaven and Berkeley—dominated US accelerator-building. In Part I the authors follow the complex story of the erosion of this dominance, and the evolution of a 200 GeV accelerator design. The lab was eventually sited in Weston, Illinois, with Robert R. Wilson as its first director.

The second framing principle—the frontier—comes into play in Part II. While the imagery of frontier exploration has long been significant in science, the authors write, it played a special role in forging and maintaining Fermilab's special identity. Physically, the lab is a "frontier-like site"; institutionally, it is the "flagship" of a "voyage of exploration." The authors admit it is an astounding coincidence that Wilson was born in a Wyoming town called Frontier, yet they take his persistent invocation of frontier imagery seriously. Drawing inspiration from Frederick Jackson Turner's famous thesis, according to which the lure

and image of the frontier have imbued Americans with a particular character, the authors claim that this image is also "a powerful tool" for understanding how science history is embedded within social history. Hoddeson and colleagues wield it, for instance, in describing the institutional formation of the lab's first few years, when Wilson's frontier vision collided with Big-Science realities during completion of the Main Ring, development of the experimental areas, and the staging of the first research. But the influence of the frontier image continued later on, the authors argue, as Wilson guided the laboratory in the first steps of an ambitious plan to use superconductivity in doubling the accelerator's energy to a trillion electron volts, or 1 TeV.

Hoddeson and company do not develop the frontier metaphor as fully as they might have. Sometimes the language of the frontier seems an appropriate characterization of the force driving the scientists, while at other times the purpose of the rhetoric seems to be to cultivate the interest of politicians and the public. How much are the bison herds imported to graze on the Fermilab site a deep expression of the forces involved? And how much do they resemble the props of Disneyland's Frontierland? More work needs to be done in unveiling the layers of meaning in this imagery before their historiographical tool can fully reveal its power.

The third framing principle of this book is megascience. The term has been around for years (as in the Megascience Forum of the Organization of Economic Cooperation and Development) to refer to large international projects whose scale has reached the next level beyond what we used to call Big Science. But the authors cleverly give the term a narrower definition, referring to what happened when Big Science began to be curtailed—to the impact on Big Science in the 1970s, when funding and resources began to shrink. In Part III they trace the effects

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of this shrinkage on the laboratory, after Wilson resigned and Leon Lederman stepped in to replace him. The impacts, they find, reached from the institutional structure to the shape of experimental traditions.

The authors use these three framing principles to keep the complex story of this laboratory in a more-or-less single narrative. This narrative integrates the main personalities and their accomplishments, although it occasionally passes over the conflicts between Fermilab and other institutions rather lightly. While Wilson's penchant for risk-taking is ably conveyed, for instance, the fact that his resignation had been part of a gamble to gain more federal support for the lab is covered only in an appendix.

Today the LHC is poised to take over the mantle of the world's most powerful accelerator. The LHC's recent difficulties, in which a structural problem in the magnets has seriously delayed operations, postponing the research and costing large sums of money, are an eerie echo of Fermilab's teething problems. This episode highlights the importance of understanding the tremendous pressures that beset such ambitious undertakings. This book makes an excellent contribution to that understanding. ■

Robert P. Crease is Chairman of the Department of Philosophy at Stony Brook University. He writes frequently about the history of physics, including in a regular column for *Physics World*. His most recent book is *The Great Equations: Breakthroughs in Science from Pythagoras to Heisenberg* (W. W. Norton, 2009).

We Hear That . . .

While writing a brief review of George Johnson's recent book, *The Ten Most Beautiful Experiments*, for the Fall 2008 newsletter, I was unaware of a similar book by Robert Crease, *The Prism and the Pendulum: The Ten Most Beautiful Experiments in Science* (Random House, 2003), but others soon brought it to my attention. The latter book (and perhaps Johnson's, too) was stimulated by a May 2002 column in *Physics World*, in which Bob solicited input from readers on what they thought were the most beautiful experiments in physics. In his September 2002 column he published the results of his poll, including the winner: Young-style double-slit experiments demonstrating the interference of single electrons, and thus their wave-like nature.

Johnson apparently read the column and wrote an article about it, "Here They Are, Science's 10 Most Beautiful Experiments," in the *New York Times*. Then both of them raced to publish a book on the topic, it appears, with Bob the winner. More recently, he's followed up with *The Great Equations: Breakthroughs in Science from Pythagoras to Heisenberg* (W.W. Norton, 2008). I received a review copy of the book just before the current issue of the newsletter went to press. This one I'll be sure to read—and perhaps review in the near future.

Two noteworthy efforts on the history of accelerator physics have recently appeared. Andrew Sessler of Lawrence Berkeley Lab and Edmund Wilson of CERN published *Engines of Discovery: A Century of Particle Accelerators*

(World Scientific, 2007), a much-needed introduction to the subject. Accessibly written, it's also loaded with photographs of pivotal machines and devices, plus sidebars on the physicists and engineers who made important contributions to the discipline. And World Scientific has released Volume 1 (2008) of *Reviews of Accelerator Science and Technology*, edited by Alex Chao of SLAC and Weiren Chou of Fermilab. This inaugural volume is filled with historical essays by some of the stalwarts of accelerator physics.

In this volume, I found Stanford University physicist Stanley Wojcicki's article, "The Supercollider: The Pre-Texas Days—A Personal Recollection of Its Birth and Berkeley Years," to be particularly rewarding. Given his leadership roles in the SSC Central Design Group and as Chair of the US High-Energy Physics Advisory Panel during SSC construction, I cannot imagine anyone better positioned to write such an article. And as leader of a project devoted to the SSC's history, I heartily recommend it.

Wojcicki will be giving an invited talk on the subject in a Forum session at the "April" APS meeting, on Monday afternoon, May 4, titled "A Personal Recollection of the SSC's Birth and Demise" (see p. 6). Just before him Adrienne Kolb, a coauthor of the book *Fermilab: The Ring of the Frontier, 1967–1995*. For Forum members interested in the history of accelerator and particle physics, this is a don't-miss occasion. ■

—Michael Riordan, Editor

Candidate Biographies and Statements

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encouraged to learn that physics was not handed down from on high, but developed a step at a time, often in much more confusing and disorganized (and more creative) ways than textbooks sometimes suggest. Students outside the sciences often find science more interesting when they can also study its historical and philosophical underpinnings. And personally, I often understand the physics better when

I learn its history; and I always find the history fascinating. The Forum has over the years done an outstanding job of bringing physicists and historians of physics (who are often themselves physicists) together. It gives historians an audience, particularly for the more technical history, an aspect historians of science all too often neglect. It shows physicists how their discipline actually developed, and helps to instill in us a

more sophisticated sense of our history, in contrast to the oversimplified and inaccurate picture often found in texts and in the folklore we hand down from one generation of physicists to the next. As someone with a foot in both camps, I would be honored to contribute to the Forum's work through service on the Executive Committee. ■

History of Physics

NEWSLETTER

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