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Lawrence Berkeley National Laboratory

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Light Source Report

Lawrence Berkeley Laboratory
University of California

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From the Chairman, Users Executive Committee:

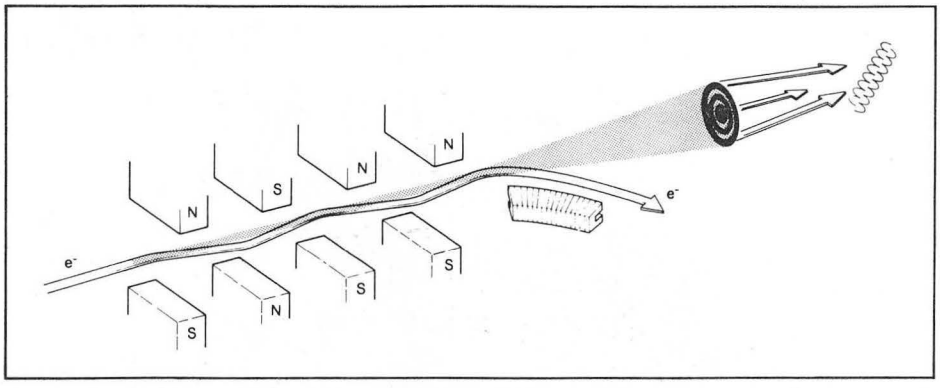
OUTLOOK BRIGHT FOR LIGHT SOURCE FUNDING

It is gratifying to note that the Department of Energy's FY 1988 Congressional Budget Request includes $18 million in construction funds for Berkeley's synchrotron light source. In a projection of further recommended funding, the DOE indicates a financial schedule of $30 million in FY89, $26 million in FY90, $17 million in FY91, and $6 million in FY92, the last year of construction. Full commissioning and beamline shakedown would follow, continuing into 1993. That the DOE should have chosen this optimal construction schedule was influenced to considerable extent, we are advised, by the strong user support and, specifically, by the large participation in the November 1985 workshop at which a detailed and persuasive scientific/technological case was made for the facility. We now hope that Congress responds favorably to the budget request so that work can proceed on this important project.

On the home front, we are extremely pleased by the appointment, announced by Project Leader Klaus Berkner, of David Attwood as scientific director of the Light Source project. Dave has played a leading role in bringing the Light Source to its present stage. He has been the focal point of liaison between our users community and the Lawrence Berkeley Laboratory, and played a key role in organizing the successful November 1985 workshop. The Center for X-ray Optics, which Dave continues to lead, has obvious wave-function overlap with the synchrotron radiation source. For example, Klaus Halbach's pioneering work on permanent magnet arrays, Kwang-Je Kim's work on the theory of insertion devices, and Malcolm Howells' studies of beamline design are of great direct benefit for the Light Source. Consequently, the Users Executive Committee, at its August 25, 1986 meeting, formally emphasized the importance of maintaining integration between the Center for X-ray Optics and the Light Source project. For all these reasons, we welcome Dave Attwood's new assignment and look forward to working with him in planning the scientific resources and users' program of the new facility.

Klaus Berkner also announced his three deputies for the project: Alan Jackson for accelerator systems, Malcolm Howells for experimental systems, and Ron Yourd as project manager for construction. We anticipate that our committee will have a particularly close working relationship with Malcolm Howells and look forward to that.

With the growing perspective of adequate funding for the Light Source, our Users Executive Committee faces mounting tasks. We have expanded the committee, both to broaden subject coverage and to increase our capability to perform the required work. Two members found it necessary to resign under pressure of other obligations: Jesse Beauchamp of the California Institute of Technology and John Schellman of the University of Oregon. We extend our sincere thanks to them for services rendered and hope for their continued, albeit less formal, involvement in Light Source matters. New additions to the



Focused undulator radiation, from the ultraviolet to soft x-ray spectral regions, will provide significant new research opportunities in the fields of biology, chemistry, interface and material sciences, and atomic and molecular physics.

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committee are Tomas Baer, who is professor of chemistry at the University of North Carolina and performs experiments at LURE and NSLS; Wolfgang Eberhardt of Exxon Research and Engineering Co., who uses NSLS and SSRL beams for work in molecular as well as surface physics; Charles Fadley of the chemistry department at the University of Hawaii, veteran experimenter at SSRL; Allen Hartford, leader of the Chemical/Laser Sciences Division at Los Alamos National Laboratory; Franz Himpsel, manager of surface physics at the IBM T.J. Watson Research Center; Stephen D. Kevan of the University of Oregon physics department, who uses NSLS for experiments on surfaces; Janos Kirz of the State University of New York at Stony Brook, who does research on x-ray imaging; Stephen Rothman, biologist on the faculty of the School of Medicine at the University of California, San Francisco; and Neville Smith of AT&T Bell Laboratories, who uses electron spectrometry with synchrotron radiation in solid state physics research. We welcome these new members of the committee and look forward to putting them hard to work. Continuing members are John Browne, Warren Grobman, Yuan Lee, Carl Poppe, Jo Stöhr, Rick Stulen, and the writer.

We have been planning and organizing a series of small symposia and workshops that bring together scientists in areas of research and development that will particularly benefit from the capabilities of the new Light Source. These meetings will serve for the exchange of ideas and stimulation of further relevant research, and very likely will help to coalesce groups of investigators with kindred interest who may later form participating research teams on the Light Source. The meetings will deal with current research, advanced opportunities and requisite facility development in the areas of atomic physics, chemistry, advanced optical systems, x-ray microscopy applied to biological and materials systems, surface science, thin films and interfaces. The workshops and symposia are described in a separate article in this issue of the *Light Source Report.*

The Light Source project derives major strength from the wide support by members of the scientific community who look forward to the new opportunities for research and technological development that it will bring about. Interested persons are cordially invited to direct questions and suggestions to any member of the Users Executive Committee or to the scientific director, David Attwood. We look forward to hearing from you.

Bernd Crasemann, Chairman
Light Source Users Executive Committee

Light-Source-Related Workshops Slated

A series of workshops and symposia is being organized to help the various scientific groups continue consideration of their proposed experiments at the Light Source and begin to define their own priorities and expectations. The meetings also will give the groups the opportunity to convey their anticipated needs to both the Users Executive Committee and the Light Source construction team for eventual decisions on resource allocations. Additional meetings will continue this process into the following year.

New Directions in Soft X-ray Near-threshold Phenomena

March 1–4, 1987, Pacific Grove, Calif.

Atomic and molecular physicists participated in a workshop on "New Directions in Soft X-ray Near-threshold Phenomena" at the Asilomar Conference Center at Pacific Grove March 1–4. The workshop was the third in a series concerning the interaction of atoms, molecules, and solids with radiation in the soft x-ray energy range. The discussion focused on physical phenomena near core levels in atoms, molecules, and solids, with special emphasis on threshold, resonant and multi-electron processes.

In conjunction with this workshop, a special session on "Future Capabilities Offered by Advanced Synchrotron Radiation Sources" was organized by Manfred Krause of Oak Ridge National Laboratory. This session gave atomic and molecular physicists the opportunity to provide input to the design of the light source with special consideration of potential new directions for understanding atomic and molecular effects in the near-threshold region. **Contact: Manfred Krause, Oak Ridge National Laboratory, Oak Ridge, TN 37831**

Chemical Applications of Undulator Radiation

May 4–5, 1987, Berkeley, Calif.

A workshop on "Chemical Applications of Undulator Radiation" is scheduled for all day Monday, May 4, and Tuesday morning, May 5, at the University of California, Berkeley. The workshop will gather technical information about the use of undulators at the Light Source, discuss a proposed UV free electron laser upgrade, and consider new types of experiments made possible by the availability of these types of radiation, particularly in the area of picosecond phenomena. The workshop also will consider design and construction features of the new ring and its ports that affect utility for the chemical community. Technical details will be presented by the Light Source staff. The remainder of the workshop will be informal, with discussions centered on such topics as synchronization of picosecond laser pulses with undulator and free electron laser radiation for pump-probe experiments, the feasibility of investigating non-linear phenomena with these very bright radiation sources, instrumentation, and other topics as seem appropriate. **Contact: Tomas Baer, Department of Chemistry, University of North Carolina, Chapel Hill, NC 27514**

New Opportunities in Optical Systems for Synchrotron Radiation

August 3–4 and 5–21, 1987, Berkeley, Calif.

A workshop on "New Opportunities in Optical Systems for Synchrotron Radiation", scheduled for August 3–21 at

Lawrence Berkeley Laboratory, will give x-ray optics specialists the opportunity to study design strategies for optical systems needed to take advantage of the special properties of the Light Source. The program will begin with a two-day general meeting, open to all, that will include a presentation of possibilities for future developments in x-ray optics with emphasis on discussions of potential applications. Working in small groups, beam-line and optical experts will then continue for the duration of the meeting to study such topics as new monochromator concepts, x-ray interferometry, linear and circular polarization, imaging systems, the role of multilayer reflective coatings, premonochromators, coherent x-ray systems, and tomography. **Contact: Malcolm Howells, Center for X-ray Optics, Lawrence Berkeley Laboratory, Berkeley, CA 94720**

International Symposium on X-ray Microscopy

August 31–September 3, 1987
Brookhaven National Laboratory

An international "Symposium on X-ray Microscopy" will be held August 31–September 3 at Brookhaven National Laboratory in Upton, N.Y. The meeting will review various forms of x-ray microscopy, and technical aspects of both the requisite radiation sources, optics, and detectors. Additional sessions will be held on the comparison of x-ray and other microscopies, radiation tolerances, biological applications of x-ray microscopy, and applications in the material and interface sciences. A special session will be devoted to early planning for advanced synchrotron radiation facilities and will provide a forum for specifically addressing implementation at the Light Source. **Contact: Janos Kirz, Department of Physics, State University of New York, Stony Brook, NY 11794**

New Opportunities in Interface and Materials Research

October 5–6, 1987,
National Academy of Sciences,
Washington D.C.

The conference on "New Opportunities in Interface and Materials Research," to be held in Washington D.C. in October, will focus on the new capabilities in materials-related disciplines that will become feasible using the high-brightness synchrotron radiation facilities planned for the Light Source. It also will provide input for the required performance of monochromators and necessary support facilities. Major research areas to be covered will include spin-polarized spectroscopies of magnetic materials and thin films; time-resolved experiments of dynamically changing systems; spectroscopies requiring very high energy, momentum, and/or spatial resolution; coincidence and desorption spectroscopies; and experiments on materials having defects and impurities at levels of extremely high dilution. A significant portion of the conference will be devoted to reaching a consensus on how the conflicting needs of these research areas can be serviced with only a relatively small number of beam lines available. **Contacts: S. D. Kevan, Department of Physics, University of Oregon, Eugene, OR 97403; F. J. Himpsel, IBM, T. J. Watson Research Center, Yorktown Heights, NY 10598**

Other synchrotron-related meetings that may be of interest include:

- **5th National Conference on Synchrotron Radiation Instrumentation,** June 22–25 at the University of Wisconsin; Contact: Roberta Ward, Synchrotron Radiation Center, Stoughton, Wis.
- **"New Opportunities in Chemistry,"** an international symposium on the uses of synchrotron radiation in chemistry, November 4–6 at Brookhaven National Laboratory, Upton, N.Y.; Contact: J.M. Preses, Brookhaven National Laboratory.

MORE INFORMATION

If you wish to know more about the scheduled conferences and workshops, indicate your interest on the form, clip and send to **Pat Butler, Center for X-Ray Optics, Lawrence Berkeley Laboratory, 1 Cyclotron Road 80-101, Berkeley, CA 94720.**

I would like additional information on the following meetings:

- ☐ New Directions in Soft X-ray Near-Threshold Phenomena
- ☐ Chemical Applications of Undulator Radiation
- ☐ New Opportunities in Optical Systems for Synchrotron Radiation
- ☐ International Symposium on X-ray Microscopy
- ☐ New Opportunities in Interface and Materials Research

My suggestions for additional meeting topics: _____

_____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

AFFILIATION _____

The *Light Source Report* is published periodically at Lawrence Berkeley Laboratory for members of the Light Source User Committee and other interested groups.

Users Executive Committee
Bernd Crasemann, Chairman
Department of Physics
University of Oregon
Eugene, OR 97403

Tomas Baer
Department of Chemistry
University of North Carolina
Chapel Hill, NC 27514

John C. Browne
Los Alamos National Laboratory
Los Alamos, NM 87545

Wolfgang Eberhardt
Exxon Research and Engineering Co.
Annandale, NJ 08801

Charles S. Fadley
Department of Chemistry
University of Hawaii
Honolulu, Hawaii 96822

Warren Grobman
IBM East Fishkill Development Lab
Hopewell Junction, NY 12533

Allen Hartford Jr.
Los Alamos National Laboratory
Los Alamos, NM 87545

Franz Himpsel
IBM T.J. Watson Research Center
Yorktown Heights, NY 10598

Stephen D. Kevan
Department of Physics
University of Oregon
Eugene, OR 97403

Janos Kirz
Department of Physics
State University of New York
Stony Brook, NY 11794

Yuan T. Lee
Department of Chemistry
University of California
Berkeley, CA 94720

Carl H. Poppe
Lawrence Livermore National Laboratory
Livermore, CA 94550

Stephen Rothman
School of Medicine
University of California
San Francisco, CA 94143

Neville V. Smith
AT&T Bell Laboratories
Murray Hill, NJ 07974

Joachim Stöhr
IBM Almaden Research Center
San Jose, CA 95128

Richard Stulen
Sandia National Laboratories
Livermore, CA 94450

Scientific Director:
David T. Attwood
Center for X-ray Optics
Lawrence Berkeley Laboratory
Berkeley, CA 94720

Project Director:
Klaus H. Berkner
Associate Director
Accelerator and Fusion
Research Division
Lawrence Berkeley Laboratory
Berkeley, CA 94720

Laboratory Director:
David A. Shirley
Lawrence Berkeley Laboratory
Berkeley, CA 94720

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Lawrence Berkeley Laboratory
Light Source Report
Public Information Department
Mail Stop 50F-134
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