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Light Source Report

Lawrence Berkeley Laboratory University of California

NEWS OF THE ADVANCED LIGHT SOURCE

A Major ALS Construction Appropriation

With the first installment of $18 million in hand, intensive activity is now under way under new project head Jay Marx

Just before its 1987 Christmas break, the Congress passed an appropriations bill for fiscal year (FY) 1988 that contains $18 million for construction of the Advanced Light Source (ALS) at the Lawrence Berkeley Laboratory. The bill was immediately signed by the President. Moreover, the President's new FY89 budget calls for $30 million for the ALS. If this and subsequent installments continue to be appropriated at the pace required for a 5-year construction schedule, the $98.7-million ALS should be ready to serve its constituents in late 1992.

Along with receipt of the first large allocation of construction money, the ALS project can report several significant news items, beginning with the naming of Jay Marx as Project Director last June. A major hurdle passed in September was approval by the University of California Board of Regents of the architecture and engineering plans of the ALS. A new cost analysis prepared for a Department of Energy (DOE) review in November showed no significant changes.

However, some issues remain to be resolved, including a parsimonious allotment for R&D and a search for the resources to build a mezzanine in the ALS building. The mezzanine would provide contiguous office and light laboratory space for the expected large number of users. Finally, the time is at hand to begin the process of forming the insertion-device teams (IDT's) and bending-magnet teams (BMT's) that will be involved in the development of the beamlines, including the experimental end stations.

Organizationally, the ALS project resides within the Accelerator and Fusion Research Division at LBL. Last June, when it seemed likely that money for construction would be appropriated, Laboratory Director David Shirley and AFRD Associate Director Klaus Berkner, who was then acting as ALS Project Director, tapped Jay Marx for the full-time job of overseeing the ALS. At the time, Marx was deputy AFRD head.

Marx received his Ph.D. at Columbia University and then joined the faculty of Yale University. At both institutions, he worked with small research groups that were users at large accelerator-based facilities. After coming to LBL, Marx became scientific spokesman and project head for the Time Projection Chamber. The TPC, an innovative, $30-million elementary particle detector requiring the efforts of 100 physicists to design and construct, was installed in the PEP electron-positron collider at the Stanford Linear Accelerator Center.

After a 1-year stint at DOE, Marx became deputy division head at AFRD. In that capacity, he served as chairperson of a high-level panel established to identify significant new scientific opportunities for LBL in the next decade. This panel focused strongly on opportunities provided by new sources of electromagnetic radiation, including the ALS. Marx feels that his broad background has given him a keen appreciation of user issues at accelerator-based, national facilities and of the scientific opportunities at the ALS.

Assisting Marx as Deputy Project Director is Max Cornacchia, an accelerator expert who has returned to LBL after a short tour of duty in Italy. David Attwood continues as Scientific Director of the ALS. The next layer of the organizational chart includes Ron Yourd as Project Manager for Construction, Alan Jackson as Deputy Project Director for Accelerator Systems, and Malcolm Howells, who has been acting as Deputy Project Director for Experimental Systems.

The table below shows that the anticipated financial schedule for the ALS has the familiar hump-backed shape of most large scientific construction projects. Continued appropriation of money according to this schedule will permit a phased commissioning of accelerator systems as the project proceeds, with the injector system (linear accelerator and booster synchrotron) being on line in FY 1990, the storage ring commissioning beginning in FY 1991, and the insertion devices and beamlines being installed and tested in FY 1992. The hope is that a sequential commissioning of this type will maximize the chances that the entire facility will be ready for users very soon after the formal end of the construction project.

Advanced Light Source Financial Schedule

Fiscal Year	Appropriations ($)
1987	1,500,000
1988	18,000,000
1989	30,000,000
1990	26,000,000
1991	17,200,000
1992	6,000,000
Total	98,700,000

A required step along the road to the ALS is approval by the University of California Board of Regents of the plans for the facility. The ALS will be located in the highly visible building that up to now has housed the historic 184-inch cyclotron. Its familiar domed roof is a Berkeley-San Francisco landmark. There was considerable sensitivity that the renovated building both preserve the general features of the original and not be objectionable to the local community.

To assure meeting these goals, the design of the annular addition had to be consonant with the architectural style of the original building. For example it was necessary to avoid a heating-ventilating-air conditioning system that relied on the typical distributed roof-top machinery of modern buildings. As the photo shows, the latest design with streamlined structures enclosing clusters of HVAC equipment accomplishes both purposes. The Regents approved the design in September.

In November, the ALS underwent its semi-annual DOE review, which uncovered no major surprises in the project planning or in the ongoing activities. In connection with this review, a new cost estimate was prepared. The bottom line is that the authorized total estimated cost of $98.7 million remains an appropriate figure. During the review, however, Marx reported to DOE officials from headquarters in Washington, D.C. and from the San Francisco Operations Office his concerns about finances in two other areas.

The first is R&D for the ALS, which as "operating" money is in a different budget category than "construction." In short, the amount currently planned for ALS R&D in FY 1988 through FY 1991 is only about half that needed by the project. The shortfall comes to about $1.1 million per year. "Equipment" money is also low, just over 50% of that needed. Discussions are continuing with DOE officials to develop mechanisms to remedy the situation.

The second concern is the proposed mezzanine in the ALS building, which was not in the original project but has been called for by potential users who see the need for it. The 50 or so scientists present at any given time to use the initial beamlines can be accommodated in the existing Building 80 adjacent to the ALS. At full capacity, however, there is expected to be approximately 250 users on site who will need office and laboratory space. A 27,500 square-foot mezzanine could service these needs.

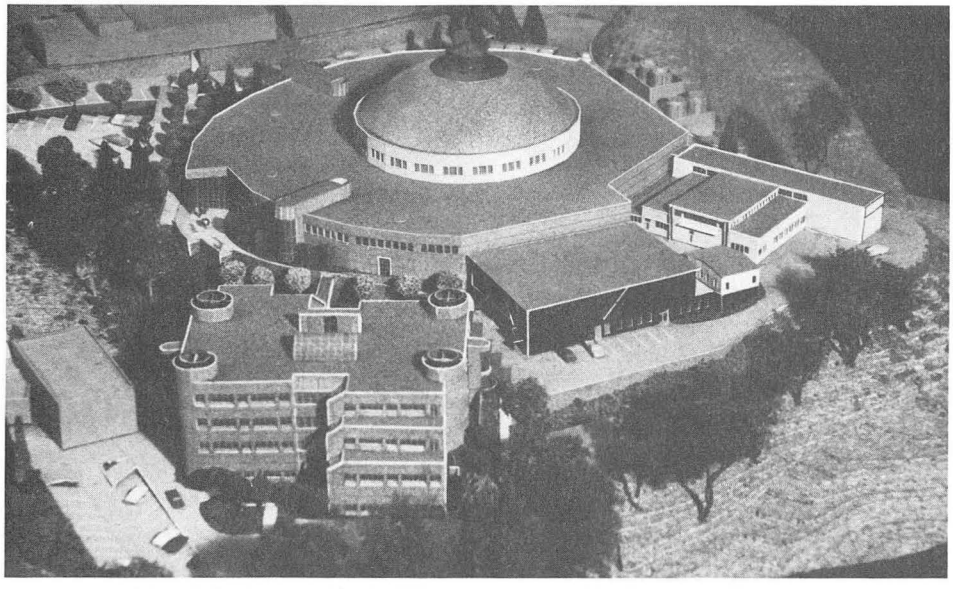
A two-part development is under consideration in which the structural elements of the mezzanine would be installed during the ALS construction, but the nondisruptive finishing elments would wait. LBL is working with both the DOE and the Users' Executive Committee to find an appropriate funding mechanism that would allow the mezzanine to be built according to this scenario.

Going on in parallel with the ALS construction is the work of the scientists who will be using the light source when it turns on. A high priority goes to the insertion devices, especially the undulators, as these will generate the high-brightness, partially coherent radiation from which so much forefront science is expected. Funds for an initial complement of five insertion devices (probably but not necessarily four undulators and one wiggler) are included in ALS construction project.

Development of insertion-device beamlines, including the design and construction of accompanying experimental stations, will be by IDT's, whereas BMT's will be involved with bending-magnet beamlines. A document now in preparation by the ALS management and by the executive committee spells out the rights and responsibilities of IDT's, BMT's, and the general users. The series of workshops already held and planned for the near future has been partially aimed at preparing the way for the formation of IDT's and BMT's. An initial call for letters of interest from prospective IDT and BMT members will be found on page 7.

Although the ALS is very definitely a national user facility open to all qualified researchers, its location at LBL, which is operated by the University of California, has stimulated UC President David Gardner to create four new academic positions within the university that will be associated with research programs at the ALS. Each appointment will be 50% at one of the nine UC campuses and 50% at LBL. The joint appointments are intended to foster quality academic research, to address the national need for young researchers trained in materials science, chemistry, biology, geosciences, and other areas, to attract faculty to the university who are interested in exploiting the research opportunities afforded by the ALS, and to enhance campus-laboratory interaction.

Relevant departments on the campuses are eligible to propose candidates, as are LBL divisions. On each campus, established academic selection and appointment criteria will be followed. At LBL, established review and hiring procedures will also be followed within sponsoring divisions. Appointees will have a home division within LBL and will be a part of the scientific program of the ALS. Anyone interested in being considered for one of the appointments should contact either the relevant department chairperson at one of the UC campuses, the relevant LBL division director, or the Scientific Director of the Advanced Light Source, David Attwood.



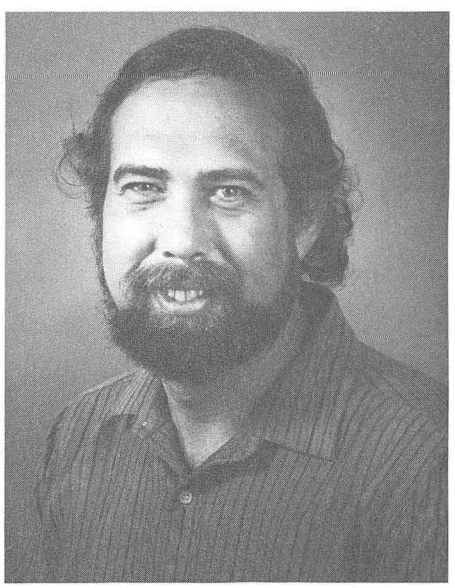
Artist's model *of the new ALS building preserves the historic character of the old 184-inch cyclotron and keeps unsightly heating-ventilating-air conditioning equipment out of view.*

From the Chairman, Users' Executive Committee:

Strong, Continued User Support Needed to Keep ALS on Track

I can think of no better news to start this letter than that concerning the Congressional approval of the initial $18 million to start construction of the Advanced Light Source. It looks very promising that funding will in fact stay on schedule and that full commissioning of the ring will in fact occur in 1992. The Users' Executive Committee understands that strong user support was critical to approval of this funding schedule. Presumably, visible and continuing user support will be instrumental in averting possibly the worst of all possible outcomes, that is, a reduction in the prospective funding or a delay in the funding schedule. With this in mind, the executive committee looks forward to helping prepare an active and productive program for the ALS Users' Association Annual Meeting scheduled for 2-3 June (see announcement on page 6).

The executive committee is extremely pleased with the appointment of Jay Marx as Project Director at the ALS. Jay comes with extensive experience in large-facility science and is working hard to apply his accumulated pragmatic wisdom in developing ALS policies. We find that he readily appreciates the issues of central concern to all potential users, from dedicated to occasional, and we anticipate fruitful interaction with him in the coming years. We are also pleased with the appointment of Arthur Robinson as Assistant Scientific Director of the ALS. We take the appointment of someone with Art's talent and experience as one indication of how important the ALS management values the input of and interaction with the user community at this early stage of the project.



***Jay Marx** took over as the ALS Project Director last June.*

Finally, we continue to be very supportive of the continued growth of the Center for X-Ray Optics at LBL. The broad expertise being developed in the center will be a crucial factor in the eventual success of the ALS. For those of you who have not seen it, the center's most recent annual report published last July gives an excellent indication of the high quality of the science and instrumentation development program there.

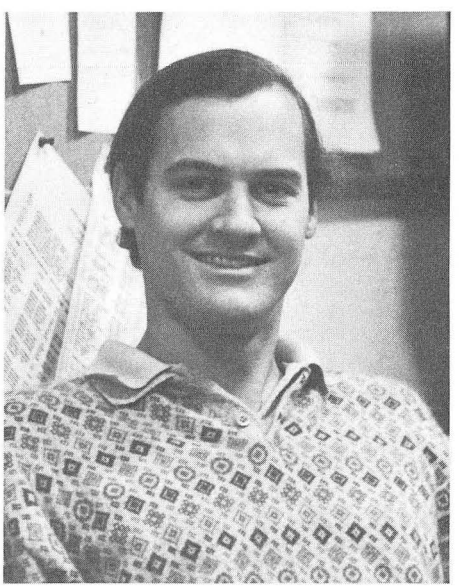
The continuing activity at the ALS project office and the gratifying budget appropriation have left the executive committee with numerous tasks. Several workshops, in a variety of disciplines and designed to bring together scientists who will benefit from the capabilities of the ALS, have been held in the past year. In these workshops, each community has tried to isolate the most important scientific issues addressed by the ALS and then to make preliminary decisions about what instrumentation will be required to enable the desired scientific research. Findings from these workshops and symposia are summarized in separate articles on pages 4 through 6 in this issue. More extensive but still brief reports from the organizers of these workshops are available on request to the *Light Source Report*.

The executive committee has been actively engaged in advising the ALS management in setting the policies under which the facility will eventually operate. We are indebted to Neville Smith, who chaired a subcommittee that drafted a flexible user policy. This document addresses general guidelines for the formation of insertion-device teams and bending-magnet teams, as well as beamline allocation and operation, and I am sure it will be of interest to many of you. It is in its final stages of review by the ALS management and will soon be available.

In addition, we are currently working to formulate a Charter under which the ALS Users' Association will operate. We hope to have this document ready to present at the annual meeting in June so that a transition to an elective executive committee can be undertaken.

As a final note, I am sure that you have noticed that a new executive committee chairperson is writing this letter. The previous chairperson, Bernd Crasemann, found it necessary to step down after a three-year tenure because of the pressure of other obligations. The executive committee ran a not-so-spirited election to choose Bernd's replacement in which I was the only candidate. Apparently, there was significant interest in keeping the chair in Oregon! It cannot be overstated how much we are indebted to Bernd for his efforts. As the first chairperson, his patient yet persistent style played a key role in the initial formulation of the ALS goals and policy as well as in the successful battle for funding. We will value his continued advice as a member of the executive committee.

Stephen D. Kevan, Chairperson
Users' Executive Committee



***Stephen Kevan** is the new chairperson of the Users' Executive Committee*

Topical Workshops Aim at ALS Research Priorities

A series of workshops and symposia has been organized with the concurrence of the ALS Scientific Director and the Users' Executive Committee to help potential users in various scientific disciplines examine the research opportunities made available by the ALS and and begin to define their priorities and requirements. The meetings also gave the groups a chance to express their anticipated needs to both the executive committee and the ALS project staff. These needs will directly affect the final choice of performance specifications of the ALS insertion devices and the associated beamlines. The following summaries have been excerpted from longer reports of three of these workshops.

New Directions in Soft X-Ray Near-Threshold Phenomena

In conjunction with the workshop "New Directions in Soft X-Ray Near-Threshold Phenomena" at the Asilomar Conference Center in Pacific Grove, California from 1 to 4 March 1987, a special symposium was held titled "Future Capabilities Offered by Advanced Synchrotron Radiation Sources." Virtually all the experimental work discussed at the workshop involved the use of synchrotron radiation (SR). It is therefore only natural that the atomic and molecular physics community would look forward to future SR sources with improved performance and would be excited by the opportunities offered by facilities such as the ALS.

As pointed out by the contributors to this symposium, there are a number of basic problems in atomic and molecular physics that still await solutions. Many of them have surfaced through the long history of the field but had to be put aside for lack of intense and tunable probes. Now we are standing at the threshold of being able to tackle these problems.

The conclusions reached at the more general workshop on an advanced SR source, held in Berkeley in November 1985, were reinforced by the presentations in this symposium. In fact, the emphasis on phenomena near the ionization threshold accentuated some of the most important requirements. In terms of SR source performance parameters, they are: (1) a resolution of better than 0.0005 eV (0.005 Å) in the 10- to 100-eV (100- to 1000-Å) range and better than the natural atomic level width at higher energies; (2) a flux of at least 10^{10} photons/sec at this resolution and preferably much higher; (3) a strong flux of circularly polarized radiation; and (4) a light-pulse duration on the order of tens of picoseconds. The resolution/flux requirements translate into a very low emittance beam because of monochromator characteristics and the need for a small source size for the high-resolution systems used in the analysis of the final photoproducts.

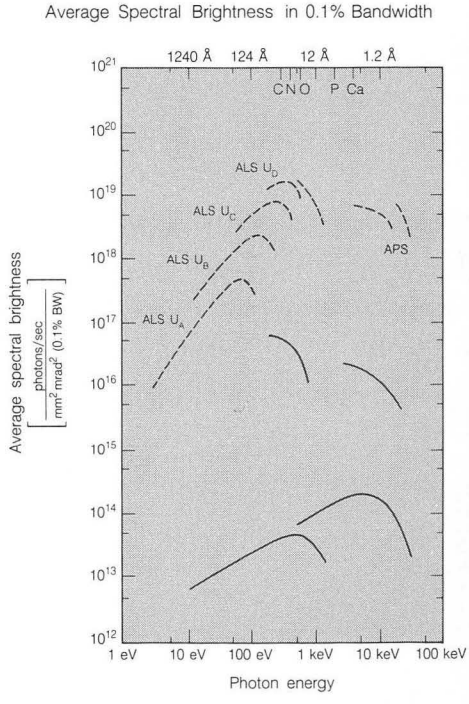
The characteristics summarized above are those considered universally important by the community of SR users involved in atomic and molecular physics. However, the following discussion is predicated on the belief that simply improving the flux/resolution parameters of a SR source initially will produce the most significant new results in atomic and molecular physics. This is not to say that other improvements are not useful, but recognizes that this community is so "flux and resolution starved" that the first major gains will come with flux and resolution enhancements alone.

One problem that may soon be addressable is the three-body continuum problem, as exemplified by the double photoionization process in helium and by ionization-Auger correlation at inner-shell thresholds. Experiments need to be carried out in which the product particles are analyzed for energy, direction, and especially angular correlation. At the same time the measurements must approach theshold where the cross section vanishes. We are at present lacking one to two orders of magnitude in available flux to undertake these experiments.

Autoionizing states, multiple-excitation states, scattering states, and shape resonances are often located in the vicinity of thresholds, both inner and outer shell. The study of these states, which generally requires both high resolution and great sensitivity, relates very directly to the problems of multi-channel or multi-configuration interactions. Here one wants to separate the various decay components, which have low cross sections, and determine the natural width of the lines, which may often be smaller than 0.1 meV.

Even in the simplest cases, the photoionization process is determined by five parameters, three matrix elements and two phase shifts. A five-parameter experiment can be conducted that allows the determination of these fundamental quantitites. However, this so-called "complete" experiment comes at a price because the simultaneous analysis of energy, angle, and spin-polarization parameters leads to a signal strength 10^3–10^4 times smaller than usual, which must be compensated by an increased flux of incident photons. Furthermore, for the determination of two of the spin parameters, the incident radiation must be circularly polarized.

While we have presented a few specific and basic experiments that await advanced SR sources, there are other techniques and studies that will benefit as well. A few examples are: time-resolved spectroscopies (these will often translate into real-time studies); the detection and study of extremely dilute species; photoinduced chemistry; and delination of the properties of excited states, atomic ions, radicals or intermediate atomic and molecular species, open-shell atoms, and last but not least, plasmas.



Predicted spectral brightness *of the undulators at the ALS and at Argonne's Advanced Photon Source (dashed lines) leapfrog that available at existing facilities (solid lines).*

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NEW ALS MAILING LIST

To be put on the new ALS mailing list, check the appropriate boxes, fill in your address, and drop the postage-paid card in the mail.

- ☐ I would like to be on the new ALS mailing list.
- ☐ In addition, I am a potential user and would like to be a voting member of the ALS Users' Association.
- ☐ I would like additional information on the upcoming workshop "New Opportunities in Surface Science."
- ☐ I would like additional information on the ALS Users' Association Annual Meeting.

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My major scientific interests are in the fields of

- ☐ Materials Science
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MS 80–101

(TO BE PUBLISHED APRIL 15, 1988)

ADVANCED LIGHT SOURCE

LAWRENCE BERKELEY LABORATORY

Call for Letters of Interest

The Advanced Light Source, a national user facility at the Lawrence Berkeley Labortory for the production of high-brightness, partially coherent x-ray and ultraviolet (XUV) synchrotron radiation is scheduled to begin serving users in the fall of 1992.

LBL is now seeking initial expressions of interest from users who plan to participate in the instrumentation of ALS beamlines as members of

- **AN INSERTION-DEVICE TEAM (IDT)**
- **A BENDING-MAGNET TEAM (BMT)**

Letters of interest are encouraged from

- **GROUPS OF SCIENTISTS**
- **INSTITUTIONS**
- **INDIVIDUAL SCIENTISTS**

LBL will be pleased to assist in the formation of multi-institutional groups in various areas of research by matching scientists with like interests.

The earliest beamline decisions will be made by September 1, 1988. Those who wish to submit letters of interest should write to:

Arthur L. Robinson, Assistant Scientific Director
Advanced Light Source
80-101
Lawrence Berkeley Laboratory
Berkeley, CA 94720

The opportunities dealt with in this workshop and, in a wider sense, in the field of atomic and molecular science, are great and challenging. Granted reliable and stable conditions in the SR source (which is a high priority), efficiency becomes a prime factor. This implies excellent preparation of the experiment by the user and rapid switchover times from one user to the next and from one beamline to another. The availability of staging areas is one of the mundane yet practical considerations that deserves special attention at any SR source.

Manfred Krause,
Oak Ridge National Laboratory

Chemical Applications of Undulator Radiation

A workshop on chemical applications of undulator radiation was held in the International House on the UC-Berkeley campus during 4 and 5 May 1987. This workshop was attended by an active group of chemists and physicists whose major interest lies in the dynamics and spectroscopy of small- to intermediate-sized molecules. Various individuals made short presentations of new types of research made possible by, or unique to, the ALS. The majority of the time was spent in a free, critical, and open discussion of these ideas. These deliberations produced some important conceptual breakthroughs.

As a result of these discussions, it became clear that undulator radiation from the ALS will have a number of unique properties of interest to the chemical community. These include short pulse duration, high brightness, and variable-polarization capability. Some of the experiments of interest include two-color studies in which the synchrotron radiation is used in conjunction with a laser. The ability to focus the radiation from the two sources to a few microns not only will insure good overlap of the two beams but also will allow the resulting electrons and ions to be collected from a small region, thereby greatly facilitating the mass or kinetic-energy analysis of the products (electrons or ions) emanating from the interaction region. Several types of two-color combinations were discussed. These include IR/SR, SR/IR, vis/SR, and SR/vis.

Some of the experiments made possible by combinations are high-resolution infrared spectroscopy of radical intermediates in molecular beams, spectroscopy of high-lying Rydberg states, and the probing of reaction-product state distributions, particularly those formed in ground electronic states. Each of these methods belongs to the general class of pump-probe experiments.

The short pulse duration of the ALS source will make possible a number of fast timing experiments. Some of these, such as the direct measurment of autoionization lifetimes or threshold photoelectron spectroscopy, can be done with just the SR itself, while others can be achieved by coupling a picosecond laser system to the synchrotron. The latter is a particularly demanding but exciting concept. By delaying one pulse with respect to the other, fast reaction rates can be measured directly by using one of the two sources to pump the molecule to an excited state and using the other pulse to probe the state as a function of time.

Timing experiments with the synchrotron have a number of advantages over pump-probe time-resolved dynamics experiments as presently conducted. In addition to the ease of tuning the SR wavelength and the ability to produce very-high-energy photons, the much higher repetition rate of the synchrotron compared to that of a typical 10-Hz laser will eliminate detector saturation and space charge effects. Thus, even though the laser may deliver more photons per second than the synchrotron, the useful signal obtained from the latter may, in fact, be higher.

A considerable portion of the workshop was devoted to a discussion of the essential features of the ALS that will insure its successful use by the chemistry community. Among these are (1) the ability to continuously scan the wavelength while maintaining a high resolution (of the order of 0.020 Å in first order near 1000 Å), (2) the ability to suppress higher orders, (3) the ability to fill one-half of the 328 buckets in the electron storage ring in a pseudo-random manner, (4) the ability to carry out laser-SR, double-resonance experiments, (5) the availability of polarized SR of various types, (6) the availability of exhaust hoods for noxious gases, and (7) access to at least two ports, one of which must be an undulator port designed to provide light between 3 and 35 eV.

Most experiments of interest to the physical chemistry community are rather sophisticated and require a considerable investment in ancillary equipment and know-how, as well as preparation time. Thus, a major recommendation of the workshop participants was to have a facility housed in a large room that contained a number of working experimental set-ups, including several molecular beam chambers with pumps and a variety of lasers. This equipment could then be used with the synchrotron port for testing elements that will eventually be used in conjunction with the synchrotron or for free-standing experiments that may have no connection with the synchrotron. In this manner, a number of visiting scientists would constantly be present, thereby enhancing the overall atmosphere of the facility.

Tomas Baer,
University of North Carolina

New Opportunities in Interface and Materials Research

A two-day workshop on the research opportunities in interface and materials science with an ultrabright storage ring optimized to produce undulator radiation in the soft x-ray region was held at the National Academy of Sciences in Washington, D.C. on 5 and 6 October 1987. The workshop was attended by 40 to 50 scientists who represented most of the subdisciplines within the materials and interfaces fields that actively use SR. This community is expected to be one of the largest at the ALS. Not surprisingly, there was general agreement that several insertion-device and bending-magnet beamlines would eventually be needed to service its diverse needs.

The materials/interface experiments that will undoubtedly benefit most from high brightness are those that combine emerging microscopies with existing spectroscopies. The ability to focus soft x-rays to a spot 750 Å in diameter with sufficient flux to do microscopy and holography experiments was recently demonstrated at the NSLS with the use of zone plates. A similar device at the ALS would have much higher flux and would thus open the possibility of combining microscopy and spectroscopy with unprecedented spatial and energy resolution. Photoelectron, photoion, or soft x-ray fluorescence microscopy on device-sized structures, small particles, and grain boundaries would be possible for the first time. These techniques should be differentiated from the more standard electron-beam microscopies by their chemical sensitivity and greatly reduced radiation damage.

Two possibilities for combining microscopy with spectroscopy will probably be used. The first would involve demagnifying the monochromatized source onto the sample with a zone plate and then using relatively standard electron and photon spectrometers. This is a quite general technique that will allow any of the many current electron, ion, or photon spectroscopies to be combined with microscopy. The second experimental technique combines a less well-focused photon beam with a magnifying electron microscope column that is coupled to an electron energy analyzer. This approach is optimized for electron and possibly ion spectroscopy and will be most useful in core-level photoelectron spectroscopy. The best energy resolution ever needed would be 0.1 eV, with 0.25 eV being adequate in most cases.

In the area of high-resolution spectroscopy, discussion centered around valence-level studies of novel, highly correlated electron systems. Interest in these has been piqued recently by the realization that the high-T_c superconductors are apparently in this class. Numerous condensed-matter effects occur on an energy scale of 1 to 10 meV. In some cases, an energy resolution of 1 to 5 meV at a photon energy of 30 eV will be required. These are the highest resolution experiments this community plans and require a high-brightness SR source, so that adequate flux can be obtained when using very high resolving power monochromators.

Core-level photoemisssion experiments will also benefit greatly from the high brightness of the ALS, since the monochromator resolving power for these experiments will be as demanding as that in the valence regime. The soft x-ray regime up to 1 keV offers access to the narrowest core levels of most important elements. These have intrinsic linewidths estimated to be in the 100-meV range.

Several other classes of experiments, such as time-resolved EXAFS and photoemission studies of kinetic processes in real time, fluorescence-detected EXAFS of very dilute systems, and spin-polarized VUV/soft x-ray photoemission, were also examined.

The ALS is being designed as, and will be implemented to be, a premier, frontier facility. It goes without saying that beam stability will be of utmost importance. Many of the most important experiments will require continuous tuning of both the monochromator and the undulator. It will be necessary to sweep the full range of the undulator in some relatively short time, say 15 minutes.

Limited discussion centered on the current difficulty of servicing the regime between 1.0 and 3.5 keV. When the ALS is operated at 1.9 GeV, undulator U_D (see figure on page 4) will provide useful flux to 3.0 keV but only in the third harmonic. This is an important regime for many materials experiments, and it would be unfortunate if access to it were limited. Some thought should be put into better ways to satisfy the needs in this regime.

The workshop participants voiced unanimous support for the idea that each insertion device should be given the highest level of technical support. It was generally agreed that existing beamlines at other facilities are not adequately supported, given the sophistication of the instrumentation involved. Mechanisms should be explored with various funding agencies and user institutions to locate adequate financial support for technical manpower. Moreover, roughly one day each week should be allotted to beamline alignment and maintenance.

Much time was spent discussing how a facility such as the ALS would operate. The essence of the problem is one of numbers. There will always be very few insertion-device beamlines as compared to the size of the potential user community. To attract the dedicated user who will actively participate in beamline construction as an insertion-device team (IDT) member and in "high-risk" experimentation, the facility will need to find ways to ensure adequate rewards for the huge investment in time involved. At the same time, the facility cannot ignore the small and occasional users, who in time will contribute just as much to its success.

Workshop participants believe that they arrived at a moderately useful recommendation to resolve this issue. It is suggested that the ALS in some way require that each insertion-device beamline have some sort of beam-switching capability. Beam time could be shared on a daily basis simply by switching the beam from one experiment to another. The smaller users could be easily serviced without major interruption of the IDT's, and the IDT's could reserve one switched port for a highly specialized instrument that would be permanently installed and not available to the general user.

Stephen Kevan,
University of Oregon

Annual Users' Meeting Slated for 2-3 June in Berkeley

The first ALS Users' Association Annual Meeting will be held in the Berkeley Conference Center on 2 and 3 June. The conference center is in the downtown area of Berkeley very close to the UC campus. This will be the first general meeting of potential ALS users since the meeting of November 1985 and the first since the ALS became a funded construction project.

As the pace of construction grows and interactions between the ALS project staff and potential users (especially prospective members of insertion-device teams or IDT's and bending-magnet teams or BMT's) intensify, the executive committee feels that it is time for the users association to begin fulfilling in a more formal way its dual roles of determining the needs and desires of the user community and expressing these to the ALS management and of being a conduit for the flow of information from the ALS management to the user community.

The annual meeting comes at a particularly appropriate time as the initial call for letters of interest from candidate IDT's and BMT's appears in this issue of the *Light Source Report* and as the time approaches for making more specific choices for the parameters of the insertion devices. A substantial fraction of the meeting will be devoted to small groups that will meet individually to discuss the formation of IDT's and BMT's in specific areas of research. It is also hoped that officials from federal agencies will be present to give their perspective on the funding climate for additional ALS beamlines.

In addition, certain organizational matters also need to be tended to, such as election of new members to the executive committee, adoption of a charter for the users association, and review of the user policy statement that outlines the rights and responsibilities of IDT's, BMT's, and general users.

To receive future mailings, please check the insert card and return it to the indicated address.

Initial Call for IDT/BMT Letters of Interest Issued

Construction has begun at the Lawrence Berkeley Laboratory of the Advanced Light Source, a national user facility based on a low-emittance electron storage ring optimized at 1.5 GeV for the production of high-brightness, partially coherent soft x-ray and ultraviolet (XUV) synchrotron radiation. The ALS is scheduled to begin serving users in the fall of 1992.

Up to 11 straight sections for insertion devices and 48 ports for bending-magnet beamlines will be available. The construction project has sufficient funds for several insertion devices and associated beamlines and for a few bending-magnet ports. Experimental stations, additional beamlines, and insertion devices will be developed based on the interests and financial commitments of potential users.

To help acquire this information and begin the process of defining the parameters of insertion devices, LBL is now soliciting initial expressions of interest from users who plan to participate in the instrumentation of ALS beamlines as members of an insertion-device team (IDT) or of a bending-magnet team (BMT). Because of the limited number of straight sections and the special quality of the radiation generated by insertion devices, three types of IDT's are anticipated, according to the degree of financial commitment.

LBL is strongly committed to serving the general user who is not a member of an IDT or a BMT. One option being explored for meeting this commitment is the provision of separate IDT and general-user experimental stations that would be served by a common insertion-device beamline on a time-shared basis.

Letters of interest are encouraged from groups of scientists, from institutions, and from individuals who wish to become associated with a group. LBL will be pleased to assist in the formation of multi-institutional groups in various areas of research by matching scientists with like interests. A packet of material will shortly be available that provides more complete information about IDT's and BMT's and that specifies what information the letter of interest should contain.

This packet will include a "User-policy Statement" that defines the privileges and responsibilities of members of the three types of IDT's, of members of BMT's, and of general users. It will also include one or more reports from ALS-related workshops and symposia held during the past year to identify scientific opportunities and define user needs.

The earliest beamline decisions will be made by September 1, 1988. Those who wish to submit letters of interest should write to

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Reformation of ALS Mailing List Under Way

With the first ALS Users' Association Annual Meeting scheduled for this June, it is timely to put some order into the existing ALS mailing list. For this reason, an insert card is appended to the centerfold of this issue of the *Light Source Report*. Those returning the card will be on the new ALS mailing list in one of two ways according to their interests:

- potential ALS users who would like to be voting members of the ALS Users' Association, and
- interested persons who would like to receive ALS mailings but are not at this time potential users.

To facilitate the construction of the mailing list, please list your address, phone number, and computer-mail address, as well as your major area of research.

Please feel free to copy the insert card and distribute it to all interested colleagues, including students.

Surface Science Workshop On Tap

To bring together members of the surface science community who are potential ALS users, the Lawrence Berkeley Laboratory is sponsoring a two-day workshop to be held on 28 and 29 April at the Lawrence Berkeley Laboratory. Special emphasis will be put on new experimental methods, as well as on techniques that deal with dynamical processes and/or with spatially and structurally resolved phenomena on surfaces. A major goal of the workshop will be to discuss, in the light of these forefront ideas, the performance goals and priorities for the ALS insertion devices required to best meet the needs of the surface science community. The meeting organizers also hope that the workshop will begin to catalyze the formation of user groups that may, for example, be centered around a specific insertion device or bending-magnet beamline.

The program will consist of several presentations by invited speakers and discussion periods with ample time for open exchange of ideas by all participants under the guidance of discussion leaders. ALS project staff, including those responsible for its design and construction and specialists in optics and beamlines, will also be present. Some of the topics to be discussed are

- new directions in NEXAFS, SEXAFS, and stimulated desorption
- soft x-ray diffraction from surfaces
- core-level studies and photoelectron diffraction
- spin-resolved measurements
- time-resolved studies
- lateral microscopy
- surface chemistry and catalysis
- semiconductor and superconductor studies
- measurements on metals, epitaxial layers, and clusters.

To receive future mailings, please check the insert card and return it to the indicated address.

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