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Research Opportunities at the Bevalac

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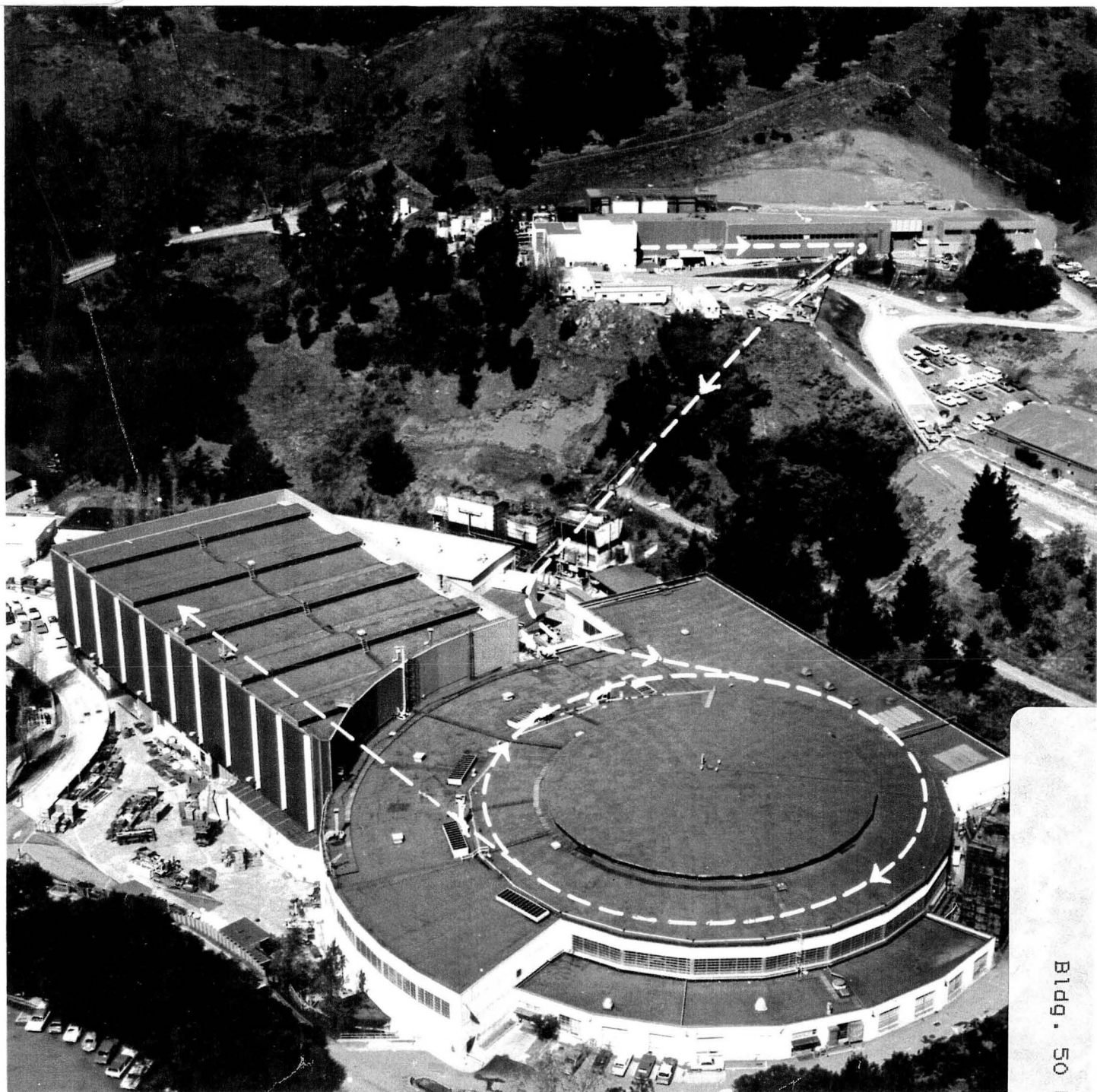
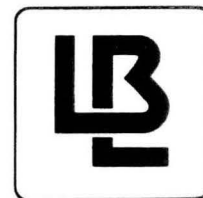
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For Reference

Not to be taken from this room

RESEARCH OPPORTUNITIES AT THE BEVALAC



Lawrence Berkeley Laboratory • University of California

Bldg. 50 Library.

Copy 1

PUB-660/10-89

Specifications:

Beam species: Hydrogen to Uranium,
with isotopic and limited
charge-state selection.

Energies: 4.9 GeV for protons
2.1 GeV/u for Si
2.1 GeV/u for Ca
1.3 GeV/u for La
960 MeV/u for U

Intensity: 10^9 per pulse for protons
 10^{10} per pulse for Si
 10^9 per pulse for Ca
 10^8 per pulse for La
 10^7 per pulse for U

Note: a typical pulse lasts
~1 sec. at a 4–6 sec. rep. rate

Facilities: HISS (Heavy-Ion
Superconducting Spectrometer)

Time Projection Chamber
(ready for physics mid-1991)

DiLepton Spectrometer

60" scattering chamber

Zero-degree Spectrometer

Streamer Chamber
(until Summer 1990)

Pion Spectrometer (Janus)

Single Arm Spectrometer

Irradiation Station

Technical support and data acquisition hardware
(VME and VAX) and software are available.

People to know:

The following LBL staff are available through
the Accelerator Research Coordination Office
Lawrence Berkeley Laboratory MS 51/208
1 Cyclotron Road, Berkeley, CA. 94720
(415) 486-5185

or by Bitnet: BEVOPS@LBL.GOV

Ass't. Division Director:	Jose Alonso
Acting Operations Manager:	Ben Feinberg
Scientific Director:	Lee Schroeder
Research Coordinator:	Gary Krebs
Scheduling Coordinator:	Fred Lothrop
Users' Liaison:	Dick McDonald
Beam-line Coordinator:	Peggy McMahan
Beam-line Coordinator:	Hank Crawford

The Program Advisory Committee (PAC)
reviews proposals and recommends to LBL
management which experiments should receive
beam time.

Program Advisory Committee Chair:
Prof. Vic Viola, Indiana University

Other Members of the PAC:
Dr. Sheldon Datz, ORNL
Prof. Konrad Gelbke, Michigan State
Prof. Alfred Goldhaber, Stony Brook
Dr. Miklos Gyulassy, LBL
Dr. Walter Henning, GSI
Dr. Franz Plasil, ORNL

The Users Executive Committee is the main
interface between the users and Bevalac
management. This committee meets monthly via
phone conference.

Users' Executive Committee Chair:
Prof. Richard Madey, Kent State

Other members of the Executive Committee:
Prof. Walt Benenson, Michigan State
Prof. Paul Brady, U.C. Davis
Dr. Harold Britt, LLNL
Dr. James Carroll, UCLA
Dr. Ken Toth, ORNL
Dr. Howard Wieman, LBL

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Research Opportunities at the Bevalac

With the 1971 marriage of the Bevatron (a weak-focusing synchrotron) and the SuperHILAC (a heavy-ion linear accelerator), the field of relativistic heavy-ion physics was born. A continuing series of upgrades to these machines now allows intense beams of ions from H to U at energies ranging from tens of MeV/u into the GeV/u range. Covering such a large area in terms of energy and particle species, the Bevalac provides significant opportunities for the nuclear scientist. In the near future, the nuclear physics program of the Bevalac will emphasize nuclear equation of state measurements, radioactive beams, and medium energy studies.

The mission of the Bevalac is to serve a wide variety of uses including nuclear physics, radiobiology, and radiotherapy. A new scheduling algorithm prioritizing larger blocks of time for the physics programs has reduced the effect of the fractionation requirements of the radiotherapy program. Nuclear science experiments now get both 2-day and 3-day weekends as well as "block" runs (nine contiguous days) ~6 times per year. This new scheduling algorithm has led to great improvements in the scientific productivity of the Bevalac, and the effectiveness of such runs is substantiated by the successes of recent neutron, anti-proton, and DiLepton experiments. Presently, experiments typically run 5-15 days per year, with additional time available for larger programs. Similarly, development programs have improved the intensities available, particularly for the very heavy ions, and improved the uniformity of the spills. Experimenters now have the ability to dial in the spill rate directly, using a feedback signal derived from their own target or counting electronics. A project to improve beam quality in terms of spot size and freedom from halo is in progress.

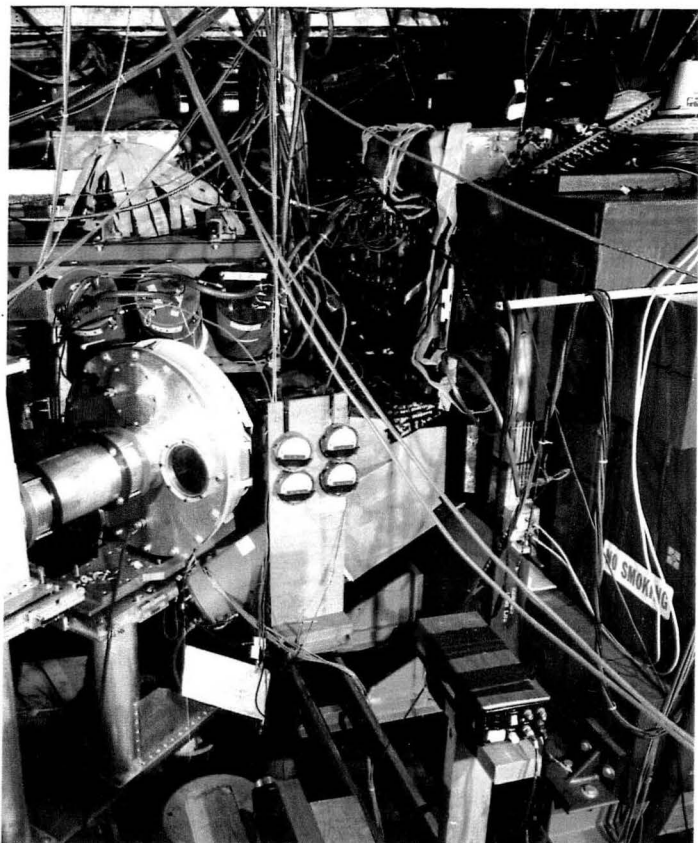
Besides improvements to the machine, we have made improvements to the experimental areas. The configuration of the experimental caves and beam lines is under rearrangement to meet the scientific priorities. The HISS cave is being expanded and two additional beam lines are expected to become available in late 1990. We are working closely with our user community to

configure these lines to meet current and future needs. A new electrical power distribution system is being installed in the caves. New space has been made available for counting houses and staging areas. An equipment pool with bar-code check-out convenience is well stocked with many of the common modules needed for experiments. There are also people to help you. At the "front line" are the beam line coordinators — Gary Krebs, Dick McDonald, Peggy McMahan, and Hank Crawford. These scientists, who often serve as collaborators with outside groups, are your advocates with management and staff in terms of getting your job done.

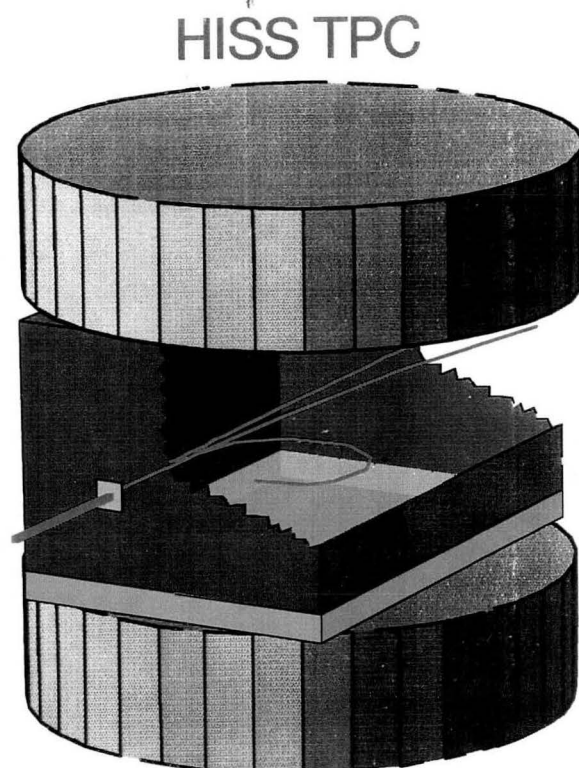
The Bevalac has a variety of scientific opportunities for both independent principal investigators and individuals or groups looking for collaborations. Most of the groups operating at the Bevalac need experienced scientists and students to work as collaborators, and would welcome the participation of individuals or groups. For principal investigators with major programs, we will work with you to provide the facilities you need.

What's the first thing to do if you are interested in a Bevalac experiment? Come for a visit! LBL is located high in the Berkeley hills overlooking the San Francisco Bay Area, and the view, particularly on a clear night is spectacular. Give us a seminar; tell us what you've been doing. Come for a tour, have lunch in our excellent cafeteria, or in one of Berkeley's unique restaurants. Stay at one of the hotels on the shuttle-bus route or in one of the homelike B&B's in the residential neighborhoods. Talk with us. If the Bevalac can provide the beams you need, we will help you with the planning process, your presentation to the PAC, and the design and construction of the facilities needed.

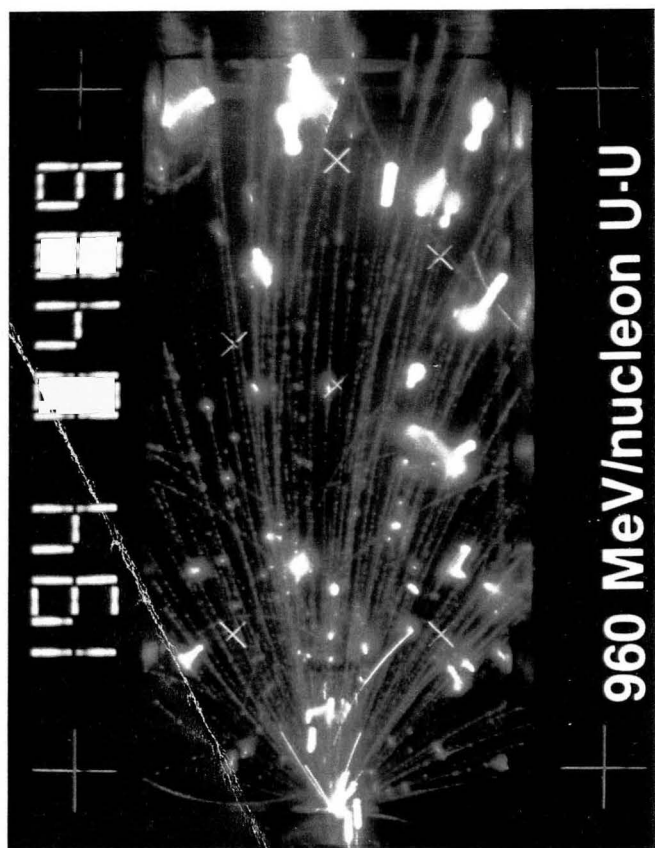
In short, opportunities at the Bevalac have been improved by a continuing series of changes, upgrades, and improvements. These are all intended to make the facility a more productive place for you, the user, to do nuclear physics. In the midst of all these changes, however, some things remain the same. The coffee is still 10¢ a cup!



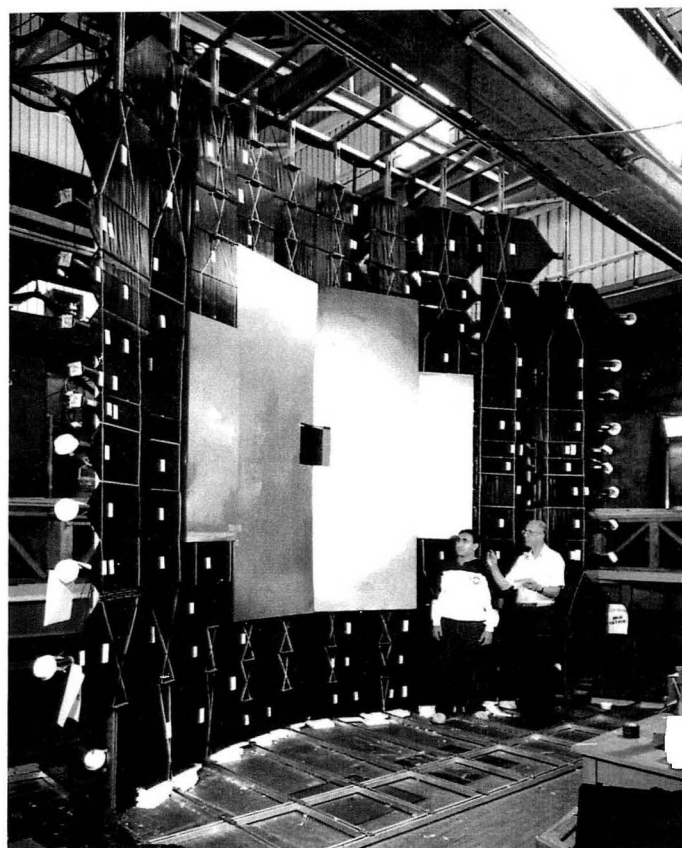
DiLepton Spectrometer



HISS TPC (Artist's conception)



U on U Collision in the Streamer Chamber



TOF Wall for the Kent State Neutron Exp.