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For Reference

Not to be taken from this room

Vol 4, No. 2 February, 1979

Associate Director: Bernard G. Harvey

Editor: Jeannette Mahoney

Report from Bernard Harvey

Last month I wrote about the proposal for construction of an Electron Cyclotron Resonance Heavy Ion Source for the 88-Inch Cyclotron. Since then several things have happened.

First, we spent many hours discussing the proposal with plasma physics experts. We rapidly learned that the way in which ECR machines work is not well understood and we could not confidently extrapolate from existing designs to achieve the 88-Inch Cyclotron design goal. Obviously, we must initiate some theoretical studies and build a model machine to test the theories.

Second, we planned this necessary R&D effort, making cost and time estimates. We then realized that a lot of money would be required - about \$2M - over a 3-year period (1979-81) and that construction should start in FY 1982 rather than '81.

This modified proposal was presented to the Facilities Subcommittee of NUSAC in Washington on February 13. The speakers were David Scott and Dave Clark from Nuclear Science Division and Hermann Grunder from Accelerator and Fusion Research Division. Hogil Kim (AFRD) was present to field any awkward questions about plasma theory. Speaking for myself and not as a member of the Facilities Subcommittee, I thought that the presentation was superb.

Now we must just wait until April 10 for NUSAC's recommendation to DOE. Keep your fingers crossed!

In January the Lab's Quarterly Injury and Illness Report was published, showing the Nuclear Science Division with an "enviable record" of no lost time injuries for 2 1/2 years, the only division to come close to such a record.

Lunch with Deng Xiaoping

Glenn Seaborg was one of approximately 600 privileged guests to lunch

with Deng Xiaoping in Seattle on the Chinese Vice-Premier's only West Coast visit. The luncheon was held on February 4th in the Washington Plaza Hotel (it was hosted by Edward Carlson of United Airlines and T. Wilson of Boeing), and was attended by Washington Governor Dixie Lee Ray, Ambassador Leonard Woodcock, Senators Henry "Scoop" Jackson and Warren Magnusson, Congressmen Mike McCormack and Joel Pritchard, as well as representatives of many local and national organizations. After the lunch, Seaborg went to the airport to meet Fang Yi, the Vice-Premier for Science, Education and Technology.

Workshop on Ultra-Relativistic Collisions Planned

LBL and GSI will conduct the First Workshop on Ultra-Relativistic Nuclear Collisions on May 21-24, 1979, at LBL. It will consist of a fairly relaxed schedule of review talks and discussions. The final notice with the list of speakers and information on housing should be mailed in mid-March. Organizers of the workshop are Miklos Gyulassy and Lee Schroeder, co-chairmen, Alan Axelrod, Rudolph Bock, Hans Gutbrod, and Arthur Poskanzer. If you are interested in attending, please contact Lee Schroeder, Bldg. 70 Room 257, Ext. 5841.

ARRIVALS AND DEPARTURES

ARRIVALS

Jorgen Randrup from Nordita, Copenhagen arrived in February to begin as a Divisional Fellow with the Theory group.

Mark Bronson has started with the Heckman/Greiner group as a computer scientist.

Matti Leino from the University of Helsinki is a new postdoc doing super-heavy element research at the SuperHILAC with Mike Nitschke and Al Ghiorso.

Roy Temes is a new student with the Seaborg group.

VISITORS

Peter Haustein of Brookhaven is here until June on a joint LBL-BNL collaboration with the Cerny group using the RAMA system at the 88-Inch Cyclotron.

Guido Ryckewaert from Université Catholique in Belgium will be doing research and development on the external PIG source injection project and studies of cyclotron beam emittance at the 88-Inch Cyclotron with Dave Clark and Rick Gough until June.

DEPARTURES

Ralph von Dincklage, who was working with the Cerny group at the 88-Inch Cyclotron, left in February to return to The University of Gottingen Department of Physics.

Jim Sivak, a computer scientist with Creve Maples, is leaving LBL to take a position at Lincoln Labs in Massachusetts.

LEAVES

Creve Maples will be away for the month of April at GANIL in France and the Hans Meitner Institute in Germany.

SEMINARS

NSD Monday seminars, 4:00 p.m., 70A-3377

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|----------|--|
| March 5 | Doug Greiner, LBL
"A Cosmic Ray Heavy Ion Experiment Birth and Adolescence" |
| March 12 | Gudrun Hagemann, Niels Bohr Institute
"Continuum Gamma Ray Studies" |
| March 19 | GRADUATE STUDENT TALKS |
| March 26 | Stretch Konzett, LBL
TOPIC TO BE ANNOUNCED |

REPORTS

- LBL 8151 Nuclear Science Division Annual Report
- LBL 8303 A Scenario for the 220 MeV $^{40}\text{Ar} + ^{238}\text{U}$ Reaction
G. J. Mathews, L. G. Sobotka, G. J. Wozniak, R. Regimbart,
R. P. Schmitt, G. U. Rattazzi, and L. G. Moretto
- LBL 8358 Pion Sources in Relativistic Heavy Ion Collisions
Meng Ta-Chung
- LBL 8530 How Fast Does the Multiplicity of Particle Production in
P-P Collisions Really Increase with Primary Energy?
Erwin M. Friedlander
- LBL 8683 Relativistic Nuclear Collisions
A. M. Poskanzer

RESEARCH

SuperHILAC News

Radiochemical Studies of the Deep Inelastic Transfer Process
K. E. Thomas, B. Jacak, D. Lee, K. Moody, G. T. Seaborg, D. J. Morrissey
(LBL); D. C. Hoffman (LASL); J. J. Hogan (McGill Univ.)

During the Fall months of 1978 a series of short bombardments (about 2 shifts each) were made using the ^{86}Kr (once) and the ^{136}Xe (twice) beams from the SuperHILAC. In these studies ^{181}Ta targets were irradiated and the reaction products with proton numbers higher than that of the target were chemically separated and detected through gamma-ray spectroscopy. In the first bombardment the feasibility of such measurements was explored using thick tantalum foils (i.e., the beam stopped in the foil) to see if the cross sections were large enough to use thinner foils. They proved to be and in subsequent experiments thin targets (about 200 MeV beam energy loss) will be used to follow the details of the transfer to the target nucleus as a function of bombarding energy. In a similar but separate study, a short bombardment of ^{244}Pu with ^{136}Xe was made in November. This was the first of a series of experiments using actinide element targets to study the deep inelastic transfer reaction. This was also the first use of a newly designed gas cooled actinide target facility which will be installed in the new zero degree beam line, E31. The ultimate goal of these experiments would be to attempt to synthesize superheavy elements using a reaction such as $^{244}\text{Pu} + ^{254}\text{Es}$, which would require the new third injector to accelerate the ^{244}Pu beam and the full E31 beam line to accommodate the ^{254}Es target. We hope to pass the next milestone on this path some time in the Spring, or somewhat later, when we plan to study the reaction of ^{165}Ho with ^{248}Cm .

88-Inch Cyclotron News

Exciting results were recently obtained in our quest to increase the K of the 88-Inch Cyclotron from 140 to 160. An 160^{4+} beam was extracted from the Cyclotron at a K of 152.4. This carefully executed experiment was designed to test for potential problems in acceleration and extraction in this untried region of the main magnet field. Happily, no problems were found! It should be pointed out that these present tests were carried out on a very cold day with special fans for cooling and several mobile "olfactory sensors" scurrying about checking for smoke, burning insulation and other nasty things. The maximum K is presently limited by the power supply of the main magnet and for routine operation is still 140; however, plans for boosting the output of the supply to approximately 3300 Amps (K = 160) should be implemented later this year. The three beams that were extracted at K = 140, 150 and 152.4 had external beam intensities as high as 45 enA. Three resulting data points for the extrapolation of K vs main magnet current were in good agreement with the predicted curve.

In another development effort, ^{84}Kr beams with charge states of 8+, 9+, 10+ and 11+ were produced at 107, 135, 167, and 202 MeV (corresponding to K = 140). The intensities observed were 250, 120, 30 and 3 enA, respectively. The 11+ beam is the highest charge state we have produced with sufficient intensities to measure on a conventional Faraday cup.

NSD NEWSLETTER

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pub288