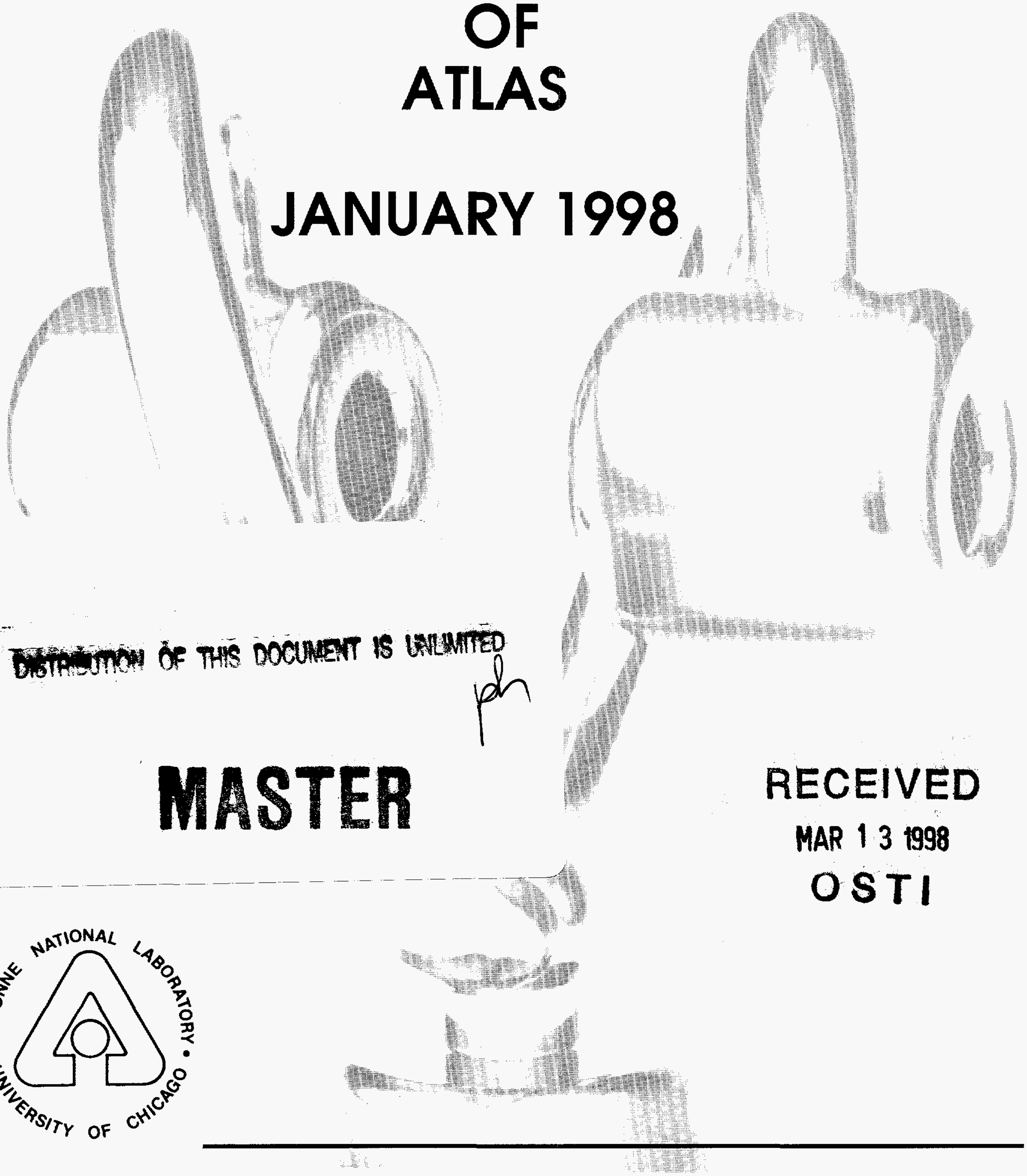
ANL-ATLAS-98-1

REPORT TO USERS OF ATLAS

JANUARY 1998



ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS

Operated by THE UNIVERSITY OF CHICAGO
for the U.S. DEPARTMENT OF ENERGY
under Contract W-31-109-Eng-38

This series of reports concerning the Argonne Tandem-Linac Accelerator System (ATLAS) is aimed at informing users about the operating schedule, user policies, and recent changes in research capabilities. The reports are issued approximately three times annually.

Edited by:

Irshad Ahmad
and
David Hofman

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REPORT TO USERS OF ATLAS

January 1998

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I. STATUS OF THE ATLAS ACCELERATOR

A total of 5369 hours of beam time was made available to the user community by the ATLAS facility for FY1997. This performance is second only to the previous year, FY1996, when an all-time ATLAS record of 5826 hours was provided for research. These hours were spread over 29 different isotopes during the year - the most diverse beam mix ever provided at ATLAS. The distribution of beam time by isotopes is shown in the pie-chart of Fig. 1. Over 31% of all beam time went to species heavier than ^{58}Ni. Beam was available 91.5% of the scheduled time, a 'reliability factor' similar to that achieved over the past two years.

In FY1996 the acceleration of 'exotic' (not naturally occurring) beam species constituted a little less than 8% of the total beam time at ATLAS. For FY1997 that total nearly doubled when 15.6% of the total beam time was devoted to exotic species. The 'exotic' species provided in FY1997 were ^{17}F, ^{8}B, and ^{56}Ni. A proposal to increase the intensity of ^{18}F by at least a factor of 10 using the dynamitron facility to locally produce the material and the ECR-PII system for ionization and acceleration is under development and looks promising.

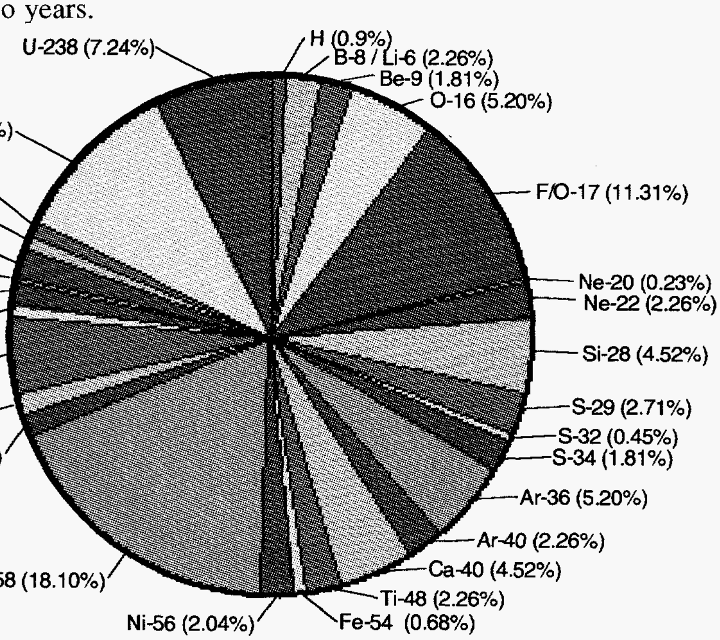

Fig. 1. Pie chart showing the isotopic mix of beams provided by ATLAS for the experimental program in FY1997. 15.6% of all beam time was for Exotic beams.

A significant set of improvements in the production and beam transport for ^{17}F and ^{8}B has been implemented. The improvements include the addition of a superconducting solenoid to improve the beam transport for the large emittance beam emerging from the production region and the relocation of the production target to a point upstream of a new superconducting rebuncher resonator which can then be used to reduce the energy spread of the secondary beam as well as to shift the energy slightly. This new rebuncher should also improve the time focus and ease of bunching at the FMA for many beams. A more detailed discussion of the first results from these improvements will appear later but an improved efficiency of approximately a factor of 10 has been achieved.

The development of the new 14 GHz ECR ion source has proceeded nicely over the past year. A record beam current of 230 eμA for $^{16}O^{7+}$ was achieved with the source over the summer. Excellent results for argon and krypton have also been obtained. The first attempt at beams from solid material samples has been made and this effort will now become our major development focus. A summary of the source performance achieved so far is shown in Fig. 2.

The connecting beamline is now under construction and should be completed in February. First beam delivery to the accelerator with the new source is planned at the same time along with tests of a new bunching system. User experiments with beams from the new source should begin soon thereafter.

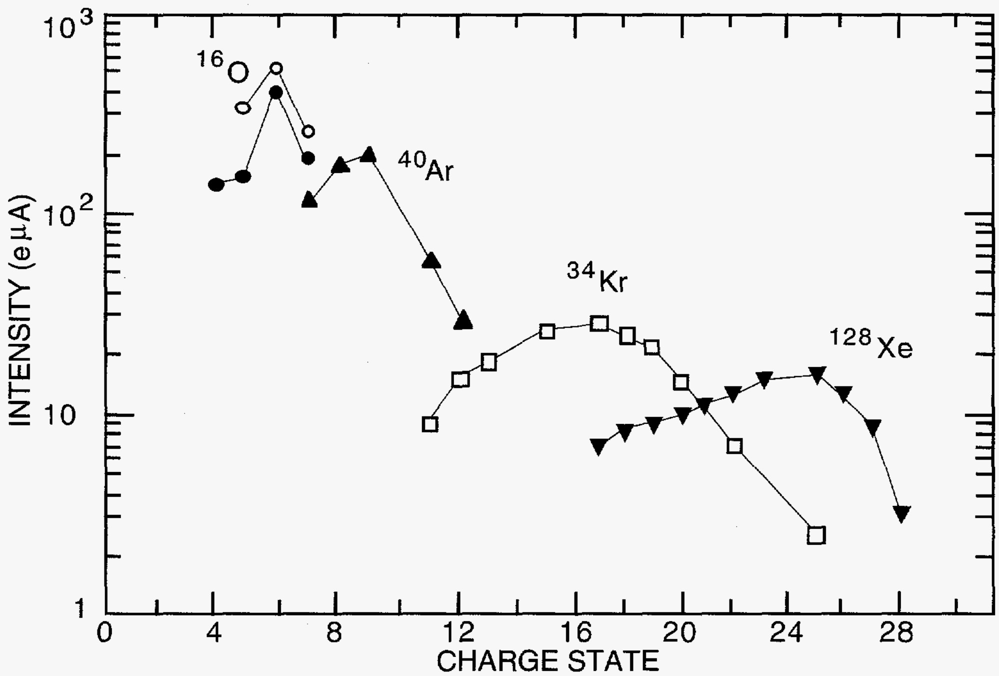

Fig. 2. Charge state distributions for various gases. Shown with filled symbols are the results in single frequency operation (14 GHz), whereas the open symbols represent the results obtained in the double frequency mode. ^{84}Kr was measured using gas with a natural isotope distribution (57% ^{84}Kr). For xenon, material enriched to 57% ^{128}Xe was used.

II. THE MOVE OF GAMMASPHERE FROM THE 88″ CYCLOTRON AT LBNL TO THE ATLAS ACCELERATOR AT ANL

The move of Gammasphere from LBNL to ANL went into top gear on 15th September, working to a detailed plan developed during the last year by scientists and engineers from the two laboratories. All the High Purity Germanium (HpGe) detectors and their BGO shields were removed in the first three weeks, well ahead of schedule. The support structure left LBNL on 23rd October and, despite delays due to snow in the Rockies, arrived safely at ANL.

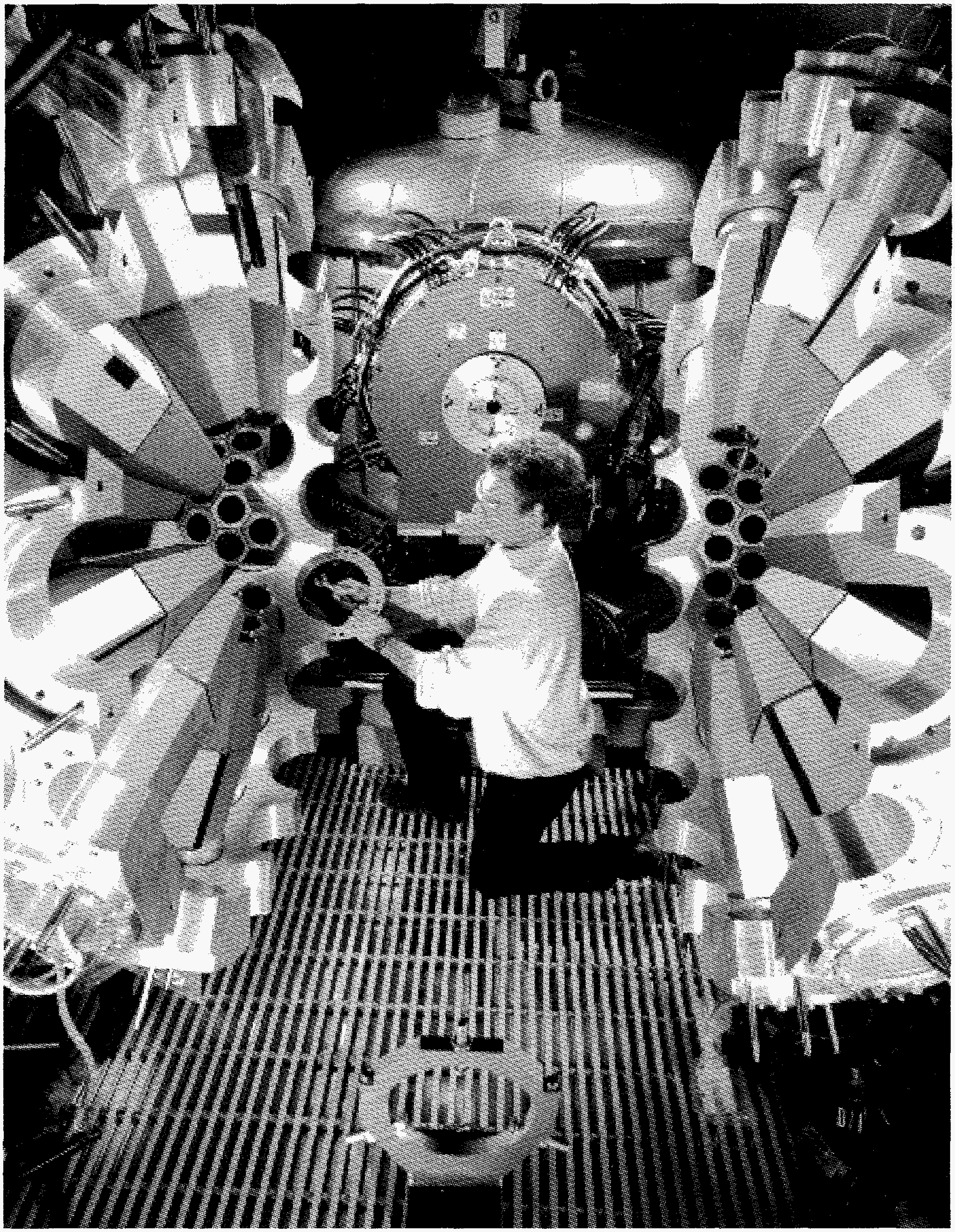

Fig. 3. Shown is the photograph of Peter Reiter mounting a germanium detector at the Gammasphere.

During the move the entire complement of gamma ray detectors has been tested and refurbished. For the HpGe detectors this involved building an annealing factory at ANL, which was used at LBNL for detector removal and annealing and has now been moved back to ANL where it is being used to prepare detectors for installation.

The move involved a close and harmonious collaboration between LBNL and ANL with scientists, engineers and support staff from ANL traveling to Berkeley for the dismantling and packing phase, and LBNL personnel traveling to Chicago to work on the re-installation.

One hundred one detectors are now installed and running, the full complement in the FMA-GS setup. The energy resolution for the entire array was measured to be 2.4 keV, the best it has ever been. In-beam tests were started on January 17th studying $^{16}O+^{58}Ni$ and $^{58}Ni+^{58}Ni$ reactions. Gamma-ray spectra in coincidence with recoil nuclei detected at the focal plane of the FMA were measured. In the first few hours of testing new nuclear structure results were obtained. The first PAC-approved experiment was conducted January 23-26, measuring Coulomb shifts in the mirror nuclei ^{51}Mn and ^{51}Fe. Prof. Mike Bently from Staffordshire University, UK, had proposed the experiment and he worked with ANL and UK scientists to collect the first data from Gammasphere at Argonne. Five more experiments are proposed for the February-March period and at least 50% of the ATLAS beamtime in the next year will be used by Gammasphere.

III. COMMISSIONING OF THE CPT MASS SPECTROMETER AT ATLAS

A new experimental facility, the Canadian Penning Trap (CPT) Mass Spectrometer, is being installed at ATLAS. The CPT is a powerful tool designed for the precise determination of the atomic masses of short-lived isotopes. It uses a combination of two ion traps, a radio-frequency quadrupole (RFQ) trap and a high-precision Penning trap, to capture and accumulate short-lived isotopes and to confine them at rest in vacuum. This then enables properties of these isotopes to be precisely determined using sample sizes as small as a few ions injected in the measurement trap. The CPT spectrometer was constructed by a collaboration involving the TASCC facility in Chalk River, the University of Manitoba and McGill University. It was moved to the ATLAS facility in April 1997 and the off-line installation of the spectrometer in the triangular room adjacent to the AREA II Enge spectrometer was completed in September 1997 (see Fig. 4).

Off-line commissioning of the CPT has progressed quickly with the capture and accumulation of ions in the RFQ ion trap achieved in September and the transfer and capture of ions in the precision Penning trap and first mass measurements performed on stable gold in the first week of November. The CPT was designed to attain a mass measurement accuracy of 0.01 to 0.001 ppm for short-lived isotopes. Commissioning of the CPT is presently continuing with mass measurements on stable isotopes being performed under various experimental conditions. These measurements will determine the operating parameters for optimum resolution and accuracy and demonstrate that the device operates reliably at its design performance.

Short-lived isotopes produced at the ATLAS facility will then be injected in the CPT after pre-selection by an Enge spectrometer and transport through an injection line. The Enge spectrometer and the experimental area surrounding it are being upgraded to allow the high beam intensities available from the new ECR source to be fully utilized for isotope production. The injection line is under construction and will be installed and commissioned in February 1998. It uses a novel linear RF-structure to thermalize and accumulate the reaction products selected by the Enge spectrometer before injection into the CPT. The CPT mass spectrometer should be available for on-line mass measurements on short-lived isotopes in March 1998. For more information, please contact Guy Savard at SAVARD@anlphy.phy.anl.gov.

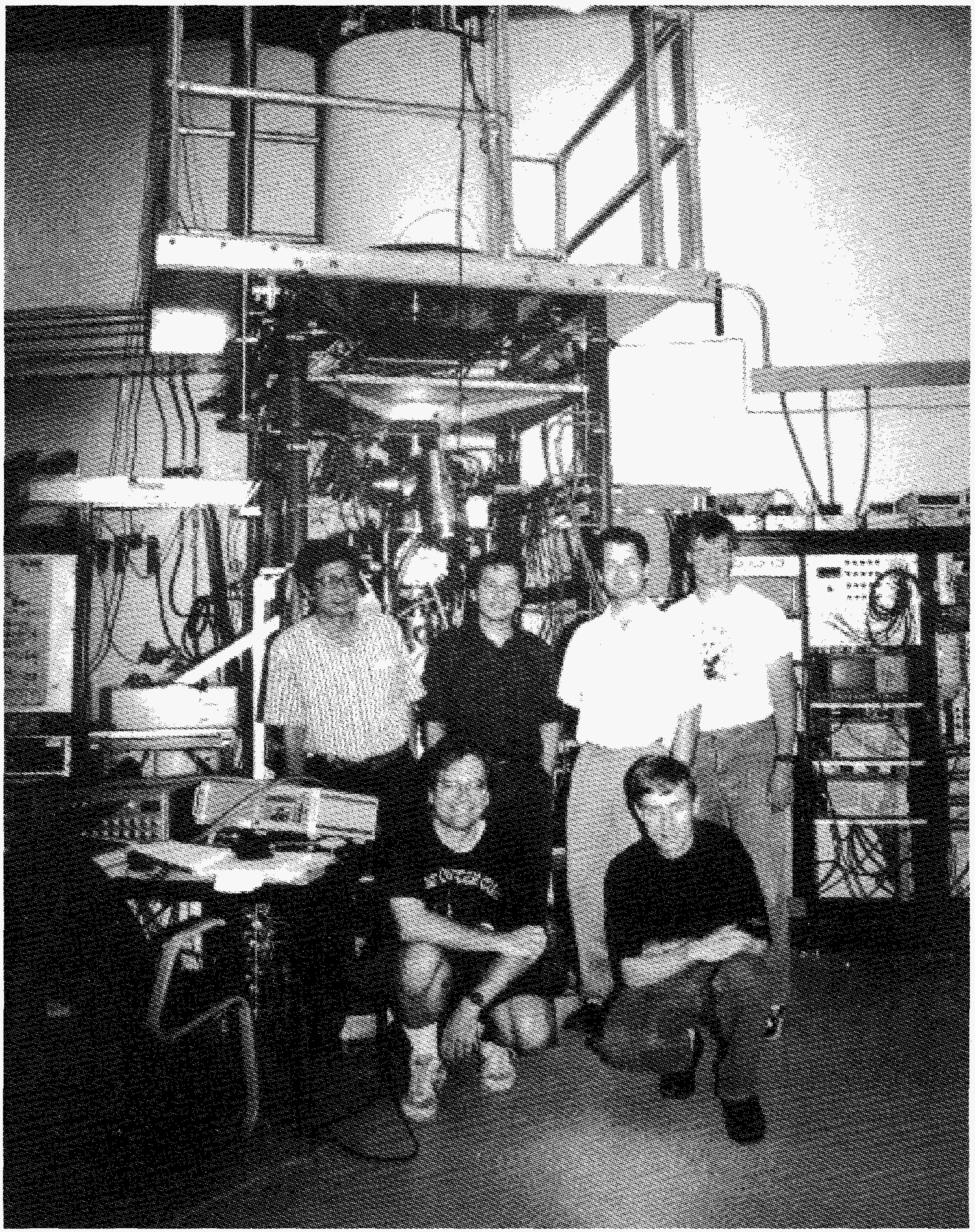

Fig. 4. The CPT mass spectrometer shown behind some of the people involved in its installation: from left to right, Jonathan Lee (McGill University), Greg Hackman (ANL), Andrew Dias (University of Manitoba), Pedro Martinez (McGill University), Juha Uusitalo (ANL) and Guy Savard (ANL).

IV. HIGHLIGHTS OF RECENT RESEARCH AT ATLAS

A. INELASTIC EXCITATION OF K-ISOMERS: MOVING TOWARDS A NEUTRON-RICH LANDSCAPE

(C. Wheldon, P.M. Walker, C.J. Pearson, Univ. of Surrey; R. D'Alarcao, P. Chowdhury, E. Seabury, Univ. of Massachusetts Lowell; I. Ahmad, M.P. Carpenter, G. Hackman, R.V.F. Janssens, T.L. Khoo, D. Nisius, P. Reiter, ANL; and D.M. Cullen, Univ. of Liverpool)

Deformed nuclei in the A=180 region provide a special arena for the observation of competing modes of generating high angular momentum. Orbitals close to the Fermi surface, with large spin alignments along the prolate symmetry axis, lead to energetically favored "yrast" configurations of aligned-particle spins K, in a region otherwise dominated by collective rotation. The characteristic signature of this feature is the occurrence of well-developed rotational bands built on long-lived K-isomers. Early theoretical predictions of "yrast traps" in this region were closely linked to experimental observations using fusion-evaporation reactions. While such reactions are efficient in generating angular momentum, the available stable isotopes for targets and projectiles limit the production of compound nuclei to the neutron-deficient side of the valley of stability. This limitation has resulted in a large gap in the experimental information available on high-K isomers in neutron-rich nuclei, as well as on the heavier stable isotopes in the A=180 region. Theoretical predictions of very-high-spin yrast isomers have remained untested for more than two decades.

Deep-inelastic reactions have recently been proven to bring significant angular momentum into the beam-like and target-like nuclei [1-3]. We decided to test the efficacy of this new mechanism in exploring K-isomer territory towards the neutron-rich side of the valley of stability in the A=180 region. Thick targets of ^{175}Lu, ^{176}Yb, ^{181}Ta and ^{186}W (the heaviest stable isotopes) were bombarded with a 1600 MeV ^{238}U beam from ATLAS. The beam was pulsed in different time ranges from microseconds to tens of milliseconds with a 20% duty cycle, and gamma-rays were detected in the dark periods between beam bursts with the ANL-Notre Dame BGO gamma-ray facility.

New long-lived high-spin isomers feeding known states in the target nuclei ^{175}Lu, ^{181}Ta and ^{186}W were observed with cross-sections large enough to allow decay schemes to be deduced on-line with a few hours of beam on target for the more straightforward odd-A cases. One of the more dramatic results was the discovery of a high-seniority isomer in ^{186}W with $T_{1/2} > 3$ ms. Four- and five-quasiparticle (qp) isomers are already known in all tungsten (Z=74) isotopes from ^{176}W to ^{182}W. However, the longest corresponding half-life is 2 microseconds in ^{180}W, and the nanosecond isomers in ^{182}W suggest an apparent decline of the importance of the K quantum number for higher neutron numbers. The new long-lived isomer in ^{186}W, as well as the new seniority-three isomers in ^{175}Lu and ^{181}Ta discovered in this experiment, provide compelling evidence that high neutron numbers do not necessarily undermine the integrity of the K quantum number, and strongly support predictions [4] of long-lived high-seniority isomers in the neutron-rich A=180 region. Figure 5 highlights the power of the deep-inelastic reaction mechanism in opening up the A=180 landscape for K-isomer studies on the neutron-rich side of the valley of stability.

While isomers in the target nuclei were populated most strongly, known 2-qp and 4-qp isomers in a whole range of nuclei around the target were also populated in each case, albeit with much smaller cross-sections, and it would require the power of a larger gamma-array for an effective exploration of the neutron-rich landscape with this reaction mechanism.

[1] R. Broda et al., Phys. Lett. **B251**, 245 (1990).

[2] I.Y. Lee et al., Phys. Rev. **C56**, 753 (1997).

[3] J.F.C. Cocks et al., Phys. Rev. Lett. **78**, 2920 (1997).

[4] S. Aberg, Nucl. Phys. **A306**, 89 (1978).
K. Jain et al., Nucl. Phys. **A591**, 61 (1995).

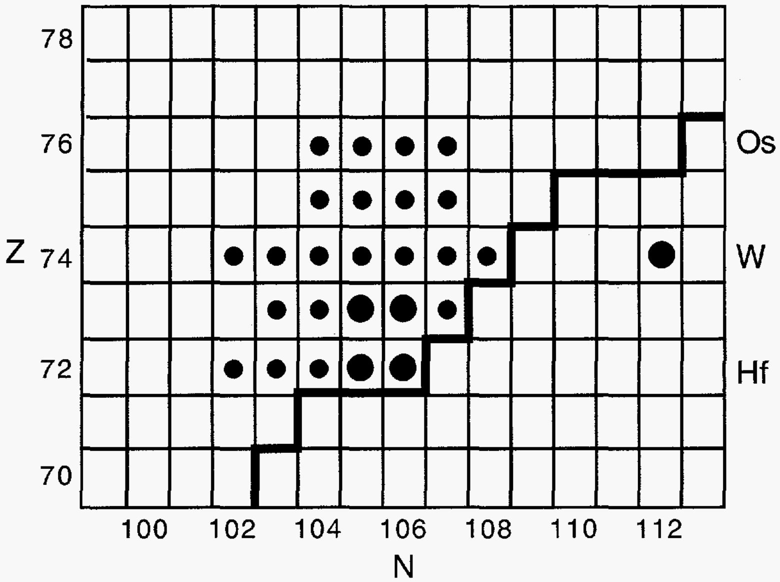

Fig. 5. The high-K-isomer region of the nuclear chart. Circles represent observed isomers with seniority ≥ 4 and $T_{1/2} > 5$ ns (large circles for $T_{1/2} > 1$ ms). The bold line shows the limit to access using fusion reactions (with ^{4}He or ^{7}Li beams). The new result for ^{186}W is well to the neutron-rich side of this limit.

B. OBSERVATION OF PROTON RADIOACTIVITY IN DEFORMED NUCLEI AT THE FMA

(C.N. Davids, D. Seweryniak, A. Sonzogni, D.J. Henderson, J. Uusitalo, ANL; P.J. Woods, T. Davinson, R.J. Irvine, Univ. of Edinburgh, UK; J.C. Batchelder, UNIRIB Collaboration; C.R. Bingham, Univ. of Tennessee; G.L. Poli, Univ. of Milano, Italy and W.B. Walters, Univ. of Maryland)

Using the ^{54}Fe + ^{92}Mo and ^{40}Ca + ^{96}Ru reactions, the new proton radioactivities ^{141}Ho and ^{131}Eu have been observed at ATLAS. They were both produced via the p4n evaporation channel, with cross-sections of ~250 and ~90 nb, respectively. The rare-earth nuclides in this part of the nuclide chart are not expected to have a measurable alpha branch, but ground state proton decay must compete with β decay and its associated background due to β delayed protons. The general absence of alpha decay in this mass region also means that triple correlated events (implantation-proton-alpha) that were used for very clean identification of proton emitters having Z>71 are not available in these experiments. To eliminate much of the delayed-proton background, a large-area Si detector was placed directly behind the double-sided Si strip detector (DSSD) used to make the proton measurements.

Figure 6 shows the decay energy spectra for the two new proton emitters, gated on implant M/Q and time interval between implantation and proton decay. The observed half-lives are 4.2(4) ms and 26(6) ms for ^{141}Ho and ^{131}Eu, respectively. From a spherical shell model viewpoint, the ^{141}Ho (Z=67) ground state should have a configuration $h_{11/2}$, $s_{1/2}$, or $d_{3/2}$, while ^{131}Eu should exhibit $g_{7/2}$ or $d_{5/2}$ character. Using the spherical WKB approximation, the resulting calculated half-lives for ^{141}Ho and ^{131}Eu are not compatible with the experimental values, indicating that these nuclides are most likely deformed. This is in accord with a number of predictions, which suggest that nuclei in this region have deformations β_2 near 0.3 [1].

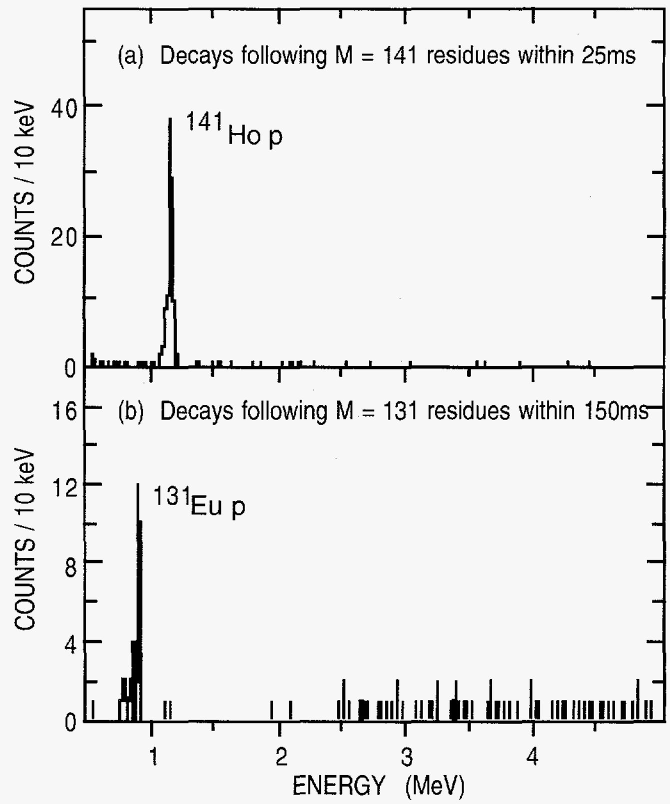

Fig. 6. (a) Energy spectrum of protons from the decay of ^{141}Ho. (b) Energy spectrum of protons from the decay of ^{131}Eu. Each spectrum shows events following an implantation into the same DSSD pixel of a reaction recoil of the specified mass and within the specified time interval.

The multi-particle theory of Bugrov and Kadmenskii [2] for the proton decay of deformed nuclei has been successfully used to interpret the decays of ^{141}Ho and ^{131}Eu [3]. Searches for further examples of proton decay in the deformed rare-earth region are being planned. In addition, an upcoming Gammasphere experiment aimed at studying the low-lying states in ^{141}Ho should provide independent information on the deformation properties of this nuclide.

[1] P. Moller, J.R. Nix, W.D. Myers and W.J. Swiatecki, At. Data Nucl. Data Tables **59**, 185 (1995).

[2] V.P. Bugrov and S.G. Kadmenskii, Sov. J. Nucl. Phys. **49**, 967 (1989).

[3] C.N. Davids et al., Phys. Rev. Lett. (in press).

C. FIRST EXPERIMENTS WITH LEPPEX--EXCLUSIVE STUDIES OF GDR IN EXCITED NUCLEI

(V. Nanal, B.B. Back, D.J. Hofman, G. Hackman, D. Ackermann, S. Fischer, D. Henderson, R.V.F. Janssens, T.L. Khoo and A. Sonzogni)

The giant dipole resonance (GDR) built on highly excited states of compound nuclei produced in heavy ion fusion reactions has been used to study nuclear properties at high temperature. The nuclear deformations and shape changes have been deduced by studying the temperature and spin dependence of the width of the GDR in A~110 and A~160 nuclei [1]. In addition to the γ rays of interest, the high-energy photon spectrum can have contributions from target contaminants (e.g. C, O) as well as from other competing processes like fission and deep inelastic collisions, especially at high excitation energy and angular momentum. Although some attempts have been made to minimize these contaminant contributions, it has not been proven that such contributions are negligible in the inclusive experiments. A few exclusive measurements [2,3] have shown that the GDR spectrum gated with the residue is considerably narrower than in singles GDR spectra, which may compromise the conclusions based on the inclusive measurements.

The nucleus ^{110}Sn is spherical in its ground state. In the case of spherical nuclei, the width of GDR spectrum at zero temperature is much narrower and is therefore more sensitive to the broadening at finite temperatures due to thermal fluctuations. Although GDR decay in Sn isotopes has been widely studied, these studies have not been performed with the positive identification of the source of the high energy photons. Recently, we have carried out an experiment at ATLAS to measure the high energy γ-ray spectra in the compound nucleus ^{110}Sn at 62 MeV excitation energy in coincidence with the evaporation residues. The compound nucleus ^{110}Sn was populated by the irradiation of a 1-mg/cm^2 ^{62}Ni target with 170-MeV ^{48}Ti ions provided by ATLAS. The high energy photons were detected in the LEPPEX array while the evaporation residues were identified in the focal plane detector of the FMA.

Figure 7a shows the results of the preliminary analysis for both the inclusive (open circles) and exclusive (filled circles) GDR spectra in the decay of ^{110}Sn. It can be clearly seen that there are significant differences between the two spectra. The yield in the GDR region is enhanced in the spectrum gated with residues A=103,104, when both the spectra are normalized at low energy (5 MeV). Similar observations were reported for ^{154}Dy [3]. Analysis is being carried out to extract the GDR parameters from a statistical model fit to the data. This would also enable the detailed comparison between the inclusive and the exclusive spectra.

The LEPPEX array used for detecting high-energy photons consists of 30 large BaF_2 detectors (5-cm x 25-cm) covered with a plastic scintillator shield for cosmic ray rejection. The sub-nanosecond fast component of BaF_2 allows γ-neutron discrimination at a distance of 30 cm from the target (see panel 7b). The response of the LEPPEX array was characterized using the standard ^{11}B(p,γ) (Ep=7.2 MeV) reaction to populate the GDR in ^{12}C which decays to the ground state with a 22.56 MeV γ ray. The high energy photons (22.56 MeV, 18.12 MeV) observed in this reaction, together with the low energy sources (0.898 MeV, 1.836 MeV and 6.13 MeV), provided the energy calibration over the entire region of 0-23 MeV. The

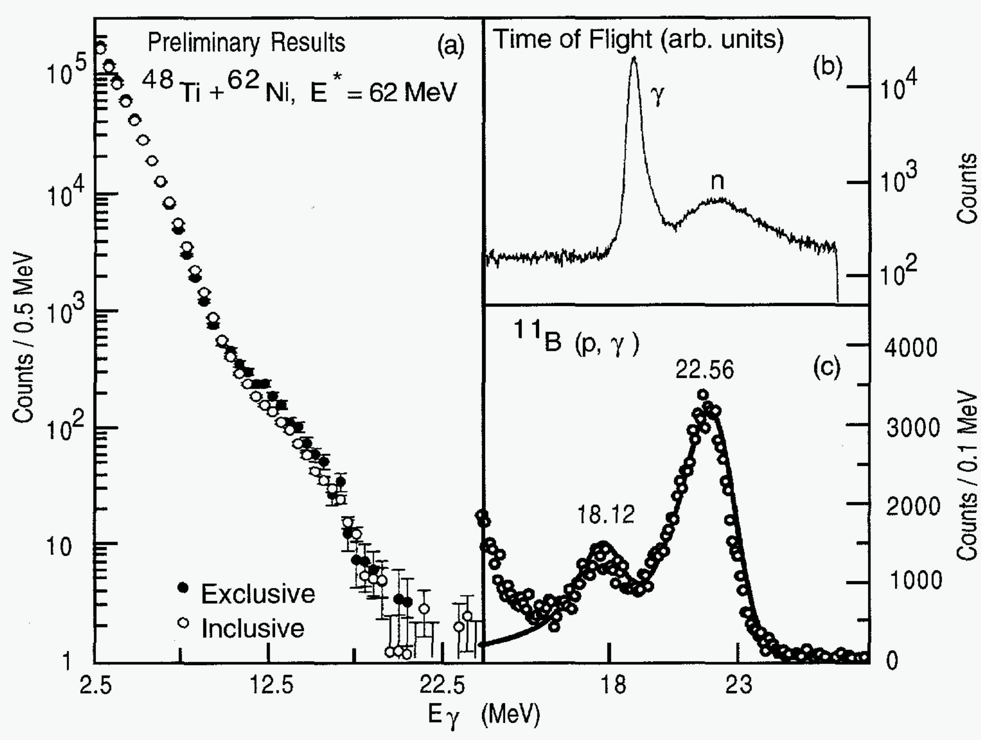

Fig. 7. (a) The GDR spectrum in the decay of ^{110}Sn gated with the residue A=103,104 (filled circles) together with inclusive spectrum (open circles). (b) The time of flight spectrum showing the n-γ discrimination. (c) The high-energy peaks from the decay of the GDR in ^{12}C to the ground state (22.56 MeV) and the first excited state (18.12 MeV). A GEANT simulation spectrum (solid line) is also shown for comparison.

energy calibration can be extended to higher energy using the minimum ionizing cosmic rays. The experimental spectrum obtained in $^{11}B(p,\gamma)$ reaction is shown in Fig. 7c. The simulated spectrum obtained from GEANT simulations, folded with gaussian of 10% FWHM, is also shown for comparison, which reproduces the data very well.

[1] J. J. Gaardhoje, Ann. Rev. of Nucl. Sci. **42**, 483 (1992).

[2] A. Atac et al., Phys. Lett. **B252**, 545 (1990).

[3] R. Noorman et al., Phys. Lett. **B292**, 257 (1992).

V. PROGRAM ADVISORY COMMITTEE

The ATLAS Program Advisory Committee has met twice since the March 1997 report to users. It met in an open session including presentations on June 23 and 24, 1997 and in a closed session on October 31 and November 1, 1997. There were a total of 65 proposals requesting 322 days. Of the submitted proposals, 37 were approved for a total of 186 days. More detailed information which concerns the PAC recommendations follows.

The present Program Advisory Committee members are:

David Balamuth	Univ. of Pennsylvania
Russell Betts	ANL
David Fossan	SUNY at Stony Brook
Bernard Haas	Institut de Recherches Subatomiques (Strasbourg)
I-Y. Lee	LBNL
Witek Nazarewicz	Univ. of Tennessee
Peter Paul (chair)	SUNY at Stony Brook
Bradley Sherrill	Michigan State Univ.

Summary of the June 1997 ATLAS PAC Meeting

- Number of new proposals submitted 23
- Total number of days requested 122
- Total number of proposals approved 17
- Total number of days approved 95
- Number of scientists involved in approved experiments 105
- Number of institutions represented 31
- Number of countries represented 7

List of Proposals Approved at the June 1997 Pac Meeting

Exp. No.	Spokes-person	Title	Days Approved
620-2	Dunford	E1-M1 Damping Interference in the Electric Field Quenching of Metastable Ar^{17+} Ions - II	5
623-2	Chowdhury	Multi-Quasiparticle K-Isomers in Neutron-rich A=180 Nuclei using Deep Inelastic Reactions	5
635-2	Seweryniak	Study of the Isometric Transitions in ^{98}Cd and ^{102}Sn	7
645	Janssens	Unsafe Coulex of the ^{244}Pu Nucleus	5
647	Savard	Half-lives and Branching Ratios of Superallowed $0^+ \rightarrow 0^+$ β-emitters	4
648X	Savard	Tests of the Area II Enge Split-Pole Upgrades for the CPT Mass Spectrometer Project	9
649X	Lister	Preparation of the FMA and Auxiliary Detectors for Operation with Gammasphere	9
650	Davids	Proton Radioactivity Studies of Deformed Nuclei using a ^{40}Ca Beam	6
651	Paul	Accelerator Mass Spectrometry of Actinide Elements with the ECR-ATLAS System	6

652X	Back	Test of a Prototype MWAC Fission Detector	1
653	Schwartz	Coulomb Excitation of Radioactive Beams Prepared by the Fragment Mass Analyzer	5
655	Champagne	Measurement of the $^{3}He(^{25}Al,d)^{26}Si$ Reaction: Production of ^{25}Al Beam	3
656	Kwok	Patterning of Vortex Channels and Square Arrays in High Temperature Superconductors with Heavy Ion Irradiation	2
657	Rehm	Measurement of an Excitation Function of the $^{17}F(p,\alpha)^{14}O$ Reaction	10
658X	Jiang	Development of a New Method for Measuring the Excitation Function for (α,γ) Reactions Induced by Radioactive Ion Beams	3
660	Murgatroyd	Measurement of the Spins of States Observed in the Reactions $^{12}C(^{20}Ne,^{12}C^{12}C)^{8}Be$, $^{12}C(^{20}Ne,^{16}O,^{8}Be)^{8}Be$ and $^{12}C(^{20}Ne,^{16}O^{12}C)^{4}He$	6
661	Schiffer	Study of the $^{56}Ni(^{3}He,d)^{57}Cu$ Reaction	9

Summary of the October 1997 ATLAS PAC Meeting

- Number of new proposals submitted 42
- Total number of days requested 200
- Total number of proposals approved 20
- Total number of days approved 91
- Number of scientists involved in approved experiments 155
- Number of institutions represented 37
- Number of countries represented 12

List of Proposals Approved at the October 1997 Pac Meeting

Exp. No.	Spokes-person	Title	Days Approved
666	Clark	Magnetic Rotation in ^{104}Sn	5
667	Janssens	Unsafe Coulex of the ^{240}Pu Nucleus	3
670	Smith	Exotic Structures in very Neutron-Deficient $55 < Z < 59$, $A \sim 120$ Nuclei	6
671LI	Butler	The Feasibility of Studying Octupole Correlations in $^{224,226}U$ using Gamma-sphere and the FMA	1
672	Svensson	Superdeformation in ^{60}Zn and Proton-Decay from Excited States in ^{66}As	5
677	Woods	Structure of Deformed Ho Isotopes Beyond the Proton Drip-Line	5
678	Davids	Proton Radioactivity of Deformed Tb and Pm Isotopes	6
681	Dasgupta	Determination of the Nuclear Diffuseness Parameter from Deep Sub-Barrier Fusion	6
682	Vetter	The Fragmentation of the Two-Phonon Octupole Strength in ^{208}Pb	4
684	Bentley	Mirror Symmetry in ^{51}Fe and ^{51}Mn	4
685	Sarantites	High-Spin Collective Structures in N = Z Nuclei in the Mass 40-46 Region	4
686	Berry	Hyperfine-Quenched Transition Rates in Helium-Like ^{59}Co	3
691	Rehm	Study of the Breakout from the Hot CNO Cycle to the (rp) Process via the $^{18}Ne(\alpha,p)^{21}Na$ Reaction	4

693	Reiter	Structure and Formation Mechanisms of Heavy Elements	7
694	Carpenter	Study of Excited States in $^{167,169}Ir$: Probing States Beyond the Proton Drip Line	5
697	Balamuth	Spectroscopy of N = Z Nuclei Populated in the $^{40}Ca + ^{40}Ca$ Reaction	5
699	Seweryniak	Search for Excitations of the ^{100}Sn Core in ^{102}Sn	6
700	Wadsworth	Shape Coexistence in Proton Rich Lead and Thallium Isotopes	5
701	Riedinger	Contrasting Causes of Enhanced Deformation in Light Pr, Nd, and Ce Nuclei	2
704	Gross	Identification of Excited States in the Proton Emitter ^{113}Cs	5

VI. ATLAS USER GROUP EXECUTIVE COMMITTEE

The current members of the ATLAS User Group Executive Committee are:

David Fossan	SUNY at Stony Brook
E. Frank Moore	NC State University
Michael Wiescher	Univ. of Notre Dame
Frank Wolfs (Chair)	Univ. of Rochester

Frank Wolfs can be reached through the User Information page on the World Wide Web (http://www.phy.anl.gov/atlas/index.html) or directly via email at wolfs@nsrl31.nsrl.rochester.edu. Users are encouraged to communicate with the Executive Committee about ATLAS issues.