REPORT TO USERS OF ATLAS

May 1995

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I. STATUS OF THE ATLAS ACCELERATOR

The first six months of ATLAS operation in the 1995 fiscal year have yielded over 2700 hours of research time. This rate is slightly higher than last year's record rate when ATLAS provided over 5200 hours of research time. A two month shutdown of ATLAS for major maintenance and system upgrades will limit our operations to approximately 4700 hours of research time for this fiscal year.

The two month shutdown began on April 13. A major upgrade of the cryogenic system, with a goal of installing new wet engines on each of the two 2800 refrigerators (Fig. 1), is the largest single task to be accomplished during this down time. These engines replace a Joule-Thomson expansion valve as the last stage of processing for helium and are expected to increase the refrigeration capacity by 25-30%. The net increase for both refrigerators is expected to be about 100 watts. The increased capacity will allow much improved cryogenic performance for the linac and will be most important for runs which require the maximum possible beam energies. The reliability and ease of operation with beams such as uranium should be significantly improved. Another significant benefit of the new engines is improved efficiency. This aspect of the upgrade will be noticeable during running periods which require only a portion of the linac to operate. The higher efficiency will mean less electrical power consumption in those runs and should result in reduced operating costs. This project is funded by a grant from an energy efficiency fund set up by DOE to promote the use of energy efficient techniques in DOE programs.

While the cryogenic system is being reconfigured, improvements and maintenance repairs are underway throughout the linac. Nearly every linac cryostat will be opened with the goal of restoring the operation of devices which have failed or whose performance has significantly deteriorated. Four resonators will be restored as will two focusing solenoids which had failed. This work is performed by the ATLAS operations and maintenance personnel while the cryogenics staff works feverishly to get the cryogenic system cold again.

Other activities include rebuilding the '40 degree bend region' to improve the vacuum and the beam diagnostics. Some of the devices in this region were initially installed as 'temporary' components. Those temporary components have been in place for nearly 10 years.

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Fig. 1. ATLAS 2800-west Refrigerator opened for modifications necessary to install the new wet expansion engine.

This shutdown will also provide some much needed access time for the continued switch-over of the ATLAS controls to the new computer control system. A major step will occur in that process by making the MicroVAX and VISTA software the primary control system and the old PDP-11/34 and software become the secondary system.

The resumption of the experimental program is scheduled for June 21 with a uranium beam. No other significant downtime is planned for the remainder of the year.

The second ECR ion source project is proceeding well. Components are now beginning to arrive. Permanent magnet material for the hexapoles, and coils for the solenoids have recently been received. The hexapole chamber and source vacuum components are now under construction. Magnetic field checks of the system will occur during the summer.

The new source requires an extension to the ATLAS facility west of the present building which will house the source, platform and merging low-energy beam line. The building construction contract was awarded in late April. Construction is scheduled to begin by May 25 and the building will be completed by the end of September. Building utilities will be installed soon after. The first beam from the source is anticipated in the Spring of 1996 and first experiments with beams from the new source are expected in late 1996 or early 1997.

A new sputtering technique for producing beams from the ECR ion source out of solids was reported in the last newsletter. The use of this technique continues to be developed. Beams of Ca, Zn, Ni, Ge, Ru, Ag, Sn, Te, Au, Pb, Bi, and U have now been developed using this method and are available for the experimental program. Some of them are still considered developmental. If you are interested in using any beam not on the ATLAS 'Available Beams' list, please contact Richard Pardo.

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II. HIGHLIGHTS OF RECENT RESEARCH AT ATLAS

Some highlights of recent experiments performed at ATLAS are summarized below. A photograph of a recent experimental group using the FMA is shown in Fig. 2.

Fig. 2. Pictured are (from left to right) Dale Henderson (ANL), Brian Zimmerman (Univ. of Tennessee), Cary Davids (ANL), Brian Busse (Oregon State Univ.), Jiban Das (Univ. of Tennessee), Carroll Bingham (Univ. of Tennessee), Richard Irvine (Univ. of Edinburgh), Phil Woods (Univ. of Edinburgh) and Ken Toth (Oak Ridge National Lab.)

A. APEX UPDATE

(Argonne, Florida State, Michigan State, Queen's, Princeton, Rochester, Washington, and Yale)

Since the last newsletter, APEX has made considerable progress in the analysis of the large data sets gathered in the Fall of 1994. In October and November of 1994, the largest data set yet collected at APEX was obtained for the $^{238}\text{U}+^{232}\text{Th}$ system at a beam energy of 5.95 MeV/nucleon. Upgrades of the apparatus, described in the previous newsletter, and excellent accelerator performance contributed to a data set containing nearly 7×10^5 e^+ events, and approximately 3.8×10^5 e^+e^- coincidence events. The analysis of the U+Th data at this point is nearly complete. Figure 3a shows an e^+e^- sum-energy spectrum obtained from U+Th collisions, demonstrating the exceptional statistics from this run. No evidence is found for sharp sum-energy lines in these data.

Another highly encouraging result was from the data taken for $^{206}\text{Pb}+^{206}\text{Pb}$ collisions at the end of the October/November beam time. This system was studied in order to search for the e^+e^- pair-decay branch of the 2.648 MeV 3^- state to the 803 keV 2^+ level. This 1845 keV E1 transition proceeds predominantly through gamma-ray emission and one in approximately every 2400 decays produces an e^+e^- pair with a fixed sum energy of 822 keV.

Fig. 3. (a) Positron-electron sum-energy spectrum obtained from U+Th collisions at 5.95 MeV/nucleon, (b) Doppler-corrected positron-electron sum-energy spectrum from $^{206}\text{Pb}+^{206}\text{Pb}$ collisions at 5.90 MeV/nucleon. The sum-energy line from the $3^- \rightarrow 2^+$ pair-converted E1 transition in ^{206}Pb is at 822 keV.

From the gamma-ray detectors installed at APEX, the absolute cross section for the population of this level was measured to be 64 ± 3 mb, in excellent agreement with the yield calculated from pure Coulomb excitation. The theoretical pair conversion coefficient for this transition is 4.1×10^{-4} , yielding a corresponding production yield for the 822 keV e^+e^- sum energy peak of about 25 μb . Figure 3b shows an e^+e^- pair sum energy spectrum, where the energies of the two leptons have been corrected for emission from the Pb ions which are moving at velocities near 0.1 c. The 822 keV sum energy peak is clearly present, and while the quantitative analysis of the data is continuing, the pair conversion coefficient extracted from the data is in good agreement with theory. The clear observation of this transition is an extremely important result, as it conclusively demonstrates the ability of APEX to reconstruct discrete pair transitions, even if the energies of the emitted leptons have been Doppler shifted significantly due to the velocities of the emitting heavy ions.

With the analysis of the positron and positron-electron data from the three production runs on U+Ta and U+Th essentially complete, attention has turned towards a more careful analysis of the acceptance and response of the APEX apparatus. A number of detailed Monte-Carlo analyses of the response of APEX to various electron, positron, and pair-emitting radioactive sources has been carried out. Figure 4a shows a simulated ^{68}Ge positron energy spectrum, and Fig. 4b the simulated pair spectrum from the $0^+ \rightarrow 0^+$ transition in ^{90}Zr , populated in ^{90}Y β^- decay. Both calculations were performed using the GEANT simulation software package from CERN. The corresponding experimental data, also obtained in the fall of 1994, appear as the bold histograms. The absolute normalization is determined from the measured strength of the radioactive sources. The agreement between the simulations and the source data is very good, giving confidence that the acceptance and the response of APEX are well understood.

Fig. 4. (a) ^{68}Ge e^+ spectrum (bold histogram), with results from simulation of APEX using GEANT (thin histogram), (b) ^{90}Zr ($0^+ \rightarrow 0^+$) e^+e^- sum energy spectrum (bold histogram), with results from GEANT simulation (thin histogram).

With the near completion of the analysis of the positron and positron-electron coincidence data from the U+Ta and U+Th systems, and a good understanding of the performance of the APEX apparatus, articles describing the first physics results, and the technical details of the experiment, are presently being prepared for publication.

B. STUDY OF THE $^{18}\text{F}(p,\alpha)^{15}\text{O}$ REACTION AT ASTROPHYSICAL ENERGIES USING A ^{18}F BEAM

(K.E. Rehm, D.J. Blumenthal, J. Gehring, D. Henderson, C.L. Jiang, J. Nolen, R.C. Pardo, J.P. Schiffer, ANL; M. Paul, Hebrew Univ.; A.D. Roberts, J. Nickles, Univ. of Wisconsin; and R.E. Segel, Northwestern Univ.)

For the first time the $^{18}\text{F}(p,\alpha)^{15}\text{O}$ reaction has been studied with a ^{18}F beam at energies which are of interest to explosive nucleosynthesis.

The measurement was carried out with a ^{18}F beam of a few ppA generated in the SNICS ion source and accelerated in the Argonne tandem accelerator. Because of the relatively long half-life of ^{18}F ($T_{1/2}=110$ min) it was possible to use a two-step procedure for the beam production. ^{18}F , which is a well-studied PET isotope, is generated at the medical cyclotron of the University of Wisconsin. Aqueous $[^{18}\text{F}]$ fluoride ions are produced via the $^{18}\text{O}(p,n)^{18}\text{F}$ reaction using a 30 μA , 11.4 MeV proton beam bombarding a 95% enriched $[^{18}\text{O}]$ water target and are electroplated onto the end of a 3 mm diameter Al anode. The total number of ^{18}F ions in the source is about 9×10^{13} .

The $^{18}\text{F}^-$ ions extracted from the ion source were accelerated to energies between 11.7 and 15.1 MeV in the tandem accelerator using the 4^+ charge state. This energy range was chosen since recent measurements of the $^{19}\text{F}(^3\text{He},t)^{19}\text{Ne}$ reaction [1] found a broad state in ^{19}Ne at an excitation energy of about 7.07 MeV.

The main difficulty in the experiment was associated with the presence of an ^{18}O admixture in the ^{18}F ion beam. Although much care was taken to remove most of the ^{18}O enriched water used in the production process, the removal was not complete. In addition, ^{18}O gas was present in the ion source from the natural abundance in air (0.2%). The large intensity differences expected between ^{18}O and ^{18}F or ^{15}N and ^{15}O , required a Z-identification method that can reliably separate these particles even at energies well below the Bragg maximum. Since normal ΔE -E techniques do not have sufficient resolving power at low energies, we have used the method of a gas-filled magnet for Z-identification of low-energy heavy ions.

In a gas-filled magnetic field, ions experience charge changing collisions with the gas molecules which result in an average charge state $\bar{q}$ which is in first order given by $\bar{q} \sim v Z \gamma$, where v is the velocity of the ions, Z their nuclear charge and $\gamma \approx 0.4$ -0.7. Introducing the equation for the average charge state into the expression for the magnetic rigidity one obtains a Z-dependence of $B\rho = mv/\bar{q}$ which is valid to very low velocities and allows a separation of isobars even for cases with very large differences in intensities. For the experiment the Enge Split-Pole spectrograph was filled with N_2 gas at a pressure of 0.5 Torr. In addition to the magnetic rigidity, the time-of-flight through the spectrograph was measured which allowed a clean separation of the reaction products according to their mass and charge.

A spectrum of time-of-flight (TOF) vs. magnetic rigidity ($B\rho$) measured at a scattering angle of $\theta_{\text{lab}} = 13^\circ$ for a 13.4 MeV ^{18}O beam bombarding a $118 \mu\text{g}/\text{cm}^2$ polypropylene target is shown in Fig. 5a. The three groups of particles seen are attributed to elastically scattered ^{18}O ions, ^{15}N ions from the ^{18}O (p, α) reaction and ^{12}C recoil ions. This identification was verified in a series of test measurements by generating recoil particles with the appropriate targets. In the same way the locations of ^{19}F , ^{16}O , ^{14}N and ^{13}C ions in the TOF vs. $B\rho$ plane were determined. The assignment of the various particle groups was supported by RAYTRACE calculations which in a Monte Carlo treatment take

Fig. 5. (a) Two-dimensional plot of time-of-flight (TOF) versus magnetic rigidity ($B\rho$) measured with the gas-filled magnet for 13.4 MeV ^{18}O ions bombarding a polypropylene target, (b) Raytrace calculation for various ions in a gas-filled magnet, and (c) Same as (a) but with a mixed ^{18}F - ^{18}O sample in the ion source.

charge-changing collisions, energy-loss, and straggling effects into account. A spectrum calculated for the split-pole spectrograph for ^{12}C , ^{15}N , ^{15}O , ^{18}O , and ^{18}F ions is shown in Fig. 5b. This calculation reproduces qualitatively the relative location of ^{12}C , ^{18}O and ^{15}N ions and, furthermore, predicts the location of the ^{18}F and ^{15}O groups which cannot be generated as recoil ions from elastic scattering. Figure 5c shows the spectrum obtained by scattering ^{18}O and ^{18}F ions from a polypropylene target when the 250 mCi ^{18}F sample was installed in the ion source. A comparison of Fig. 5a and 5c clearly shows excess counts in the area where ^{18}F and ^{15}O ions are expected.

The results of the energy dependence of the $^{18}\text{F}(p,\alpha)^{15}\text{O}$ reaction are shown in Fig. 6 where the center of mass cross section is plotted as a function of the c.m. energy. A strong energy dependence is observed. The horizontal bars represent the target thickness of the CH_2 target which was measured before and after the experiment with an ^{241}Am source. The solid line represents a resonance at $E_x=7.067$ MeV. From the resonance strength $\omega\gamma=3.7\pm0.9$ keV, a lower limit for the proton width $\Gamma_p=5$ keV could be deduced. A comparison with the Wigner limits for different spin assumptions indicated that the experimental width is only consistent with spin values of $1/2^+$ and $3/2^+$. Since earlier measurements of elastic scattering in the system $^{15}\text{N} + \alpha$ have found a $3/2^+$ state in the mirror nucleus ^{19}F [2], a $3/2^+$ value is suggested for the 7.067 MeV state in ^{19}Ne .

Fig. 6. Cross section measured at three energies for the $^{18}\text{F}(p,\alpha)^{15}\text{O}$ reaction at $\theta_{\text{cm}}=110\pm5^\circ$. The solid line corresponds to a resonance at an excitation energy of 7.067 MeV in ^{19}Ne . The point at 660 keV represents the average of three measurements, one taken just before the 580 and 760-keV points, and one after. The horizontal bars reflect the energy interval covered by the target thickness.

Further improvements in the efficiency of the ion source and the transmission of the tandem accelerator by a factor of 10 are possible. This will allow an extension of the (p,α) experiments to lower energies and a measurement of the $^{18}\text{F}(p,\gamma)$ reaction.

- [1] P. Parker, First Symposium on Nuclear Physics in the Universe, Oak Ridge, TN (1992) and M. Wiescher, private communication.
- [2] H. Smotrlich et al., Phys. Rev. **122**, 232 (1961).

C. DISCOVERY OF NEW HEAVY PROTON RADIOACTIVITIES AT THE FMA

(C.N. Davids, D.J. Blumenthal, D.J. Henderson, L.T. Brown, B.C. Busse, L.F. Conticchio, H.T. Penttila, A.H. Wuosmaa, ANL; T. Davinson, R.J. Irvine, R.D. Page, P.J. Woods, Univ. Edinburgh, UK; C.R. Bingham, B.E. Zimmerman, Univ. Tennessee; J.J. Das, K.S. Toth, ORNL; J.C. Batchelder, P.K. Joshi, Louisiana State Univ.; W.B. Walters, Univ. Maryland; A.V. Ramayya, Vanderbilt Univ.; S.J. Freeman, Univ. Manchester, UK; M. Freer, Univ. Birmingham, UK)

Using ^{78}Kr and ^{92}Mo beams from ATLAS to bombard various neutron-deficient Mo and Ru targets, a total of 6 new proton radioactivities have recently been identified at the FMA. They were observed after passing the recoiling evaporation residues through the focal plane PPAC and implanting them into a double-sided silicon strip detector (DSSD) located 40 cm behind the focal plane. In all cases, their proton emission was correlated in time and position with the alpha decay of the daughter nuclide, providing a unique identification of the original proton emitter. Scattered beam arriving at the detector was eliminated using an energy and time-of-flight requirement.

The new proton radioactivities observed are: ^{161}Re , $^{165,166,167}\text{Ir}$, ^{171}Au , and ^{185}Bi . All of these are heavier than any previously known proton emitters, and have half-lives ranging from 43 microseconds (^{185}Bi) to several tens of milliseconds. In the case of Ir, this is the first element in which 3 isotopes have been identified as being proton emitters. In addition, ^{165}Ir is the first proton emitter observed by forming it through the weak p4n evaporation channel. This nucleus actually emits two different protons, as is shown in Fig. 7. The ^{185}Bi isotope is the first proton emitter found with $Z > 82$, and promises to shed new insights into the shell structure of this region, where an $s_{1/2}$ intruder state is expected to lie very close to the $h_{9/2}$ ground state. Figure 8 shows where the new emitters lie in the chart of the nuclides.

Fig. 7. Energy spectrum of protons preceding the alpha decay of ^{164}Os , the decay daughter of ^{165}Ir .

Fig. 8. Portion of the chart of the nuclides containing the new proton radioactivities.

Most of these proton emitters were observed using the new DSSD electronics designed by a joint University of Edinburgh/Rutherford Laboratory group. With this system, a proton resolution of <15 keV FWHM has been achieved, significantly better than that obtained with the previous system.

D. FINE-STRUCTURE ENERGIES FOR THE $1s2s\ ^3S_1-1s2p\ ^3P_{0,2}$ TRANSITION IN HELIUM-LIKE Ar^{16+}

(K.W. Kukla, A.E. Livingston, Univ. of Notre Dame; J. Suleiman, H.G. Berry, R.W. Dunford, D.S. Gemmell, E.P. Kanter, ANL; S. Cheng, L.J. Curtis, Univ. of Toledo)

Helium-like ions are among the simplest systems in which the understanding of the quantum field theoretical treatment of a bound system of many particles still poses interesting unsolved problems [1]. A new generation of relativistic calculations of $n=2$ state energies in helium-like ions has appeared over the past two years [2] that has established significantly improved benchmarks of theoretical accuracy in our understanding of the two-electron atomic system.

In order to provide a test of the new atomic structure calculations at the level of $<0.1(Z\alpha)^4$ a.u. (atomic units), we have performed a precision spectroscopic measurement in the helium-like Ar^{16+} ion using thin-target ($100\ \mu\text{g}/\text{cm}^2$ carbon) excitation of a 160-MeV ATLAS beam of ^{40}Ar [3]. The $1s2s\ ^3S_1-1s2p\ ^3P_{0,2}$ fine-structure transition wavelengths in the Ar^{16+} beam fluorescence were measured to a precision of 30 ppm using a vacuum-ultraviolet grating spectrometer equipped with a microchannel-plate position-sensitive detector (PSD).

One PSD spectrum of highly-ionized argon is shown in Fig. 9, where the 3S_1 - 3P_0 transition appears in the third order of diffraction at 1985Å. High n-state Rydberg transitions and other 2s-2p transitions in the helium-like, lithium-like, and beryllium-like argon ions are also seen. Our final results for the 3S_1 - 3P_2 and 3S_1 - 3P_0 transition wavelengths are 559.944(16)Å and 661.533(18)Å, respectively. These measurements test the total QED corrections to the transition energies to better than 0.5%.

Fig. 9. Spectrum of highly-ionized argon observed across the 40-mm PSD.

Our measurements confirm the importance of newly-calculated relativistic energy terms of order $(Z\alpha)^4$ a.u.[2]. Small remaining discrepancies between our results and these accurate relativistic calculations provide the first experimental estimate of the size of uncalculated higher-order QED contributions, also of dominant order $(Z\alpha)^4$ a.u., in helium-like atomic structures. Specifically, our results suggest the need for a reduction in the QED contributions to the $1s2s\ ^3S_1$ state energy for Ar^{16+} by about 4.5×10^{-5} a.u., or $0.15(Z\alpha)^4$ a.u., a 1% correction to the total QED effects.

- [1] H.G. Berry, R.W. Dunford, and A.E. Livingston, Phys. Rev. **A47**, 698 (1993).
- [2] D.R. Plante, W.R. Johnson, and J. Sapirstein, Phys. Rev. **A49**, 3519 (1994).
- [3] K.W. Kukla et al., Phys. Rev. **A51**, 1905 (1995).

III. CONCEPT FOR AN ADVANCED EXOTIC BEAM FACILITY BASED ON ATLAS

(K.E. Rehm, I. Ahmad, B.B. Back, C.N. Davids, W.F. Henning, R.V.F. Janssens, C.-L. Jiang, C.J. Lister, J.A. Nolen, J.P. Schiffer and K.W. Shepard)

The acceleration of beams of unstable nuclei has opened up new research frontiers. Experiments at existing accelerators, and particularly at the first generation of radioactive ion beam facilities, have demonstrated convincingly that unique information becomes accessible. Critical cross sections for astrophysical processes that were impossible to

obtain previously, qualitatively new and unexpected nuclear structure effects in nuclei far from stability, completely new approaches to studies of nuclear decays, reactions and structure, all have triggered much excitement for this new dimension in nuclear research.

To explore this new dimension, an extension of present technical capabilities and facilities is needed. This need and its scientific basis were discussed in various workshops and symposia and in the Isospin Laboratory (ISL) White Paper. A report by the European community was published recently on prospects of radioactive beam facilities in Europe, and some next-generation projects for such facilities are starting in both Europe and Japan.

A group from the Physics Division has during the last year discussed the issues associated with a next-generation facility. A workshop about "Research Opportunities with Secondary Beams at ATLAS" was held on January 13-14, 1995 at Argonne, where the concept for an Advanced Exotic Beam Facility was presented and possible experiments were discussed.

Our base design uses a flexible approach for the primary accelerator and builds on the availability of the state-of-the-art heavy-ion accelerator ATLAS as the post accelerator. This is particularly important in view of the stringent beam quality requirements for nuclear structure and astrophysics experiments. The approach also allows timely construction of such a major facility.

The core idea of our concept is the use of about 0.1 pmA of 100-MeV neutrons from the breakup of 200-MeV deuterons. Spatial separation between the breakup target and the radioisotope production target solves some of the ion source problems encountered at high beam powers with charged-particle beams that undergo predominantly electronic (heat and radiation damage generating) energy loss. The purely nuclear energy loss and the long range of neutrons allow rather large target thicknesses to be used for more effective isotope production. To retain flexibility for optimizing secondary production yields by using a variety of radionuclide production mechanisms, our choice for the primary accelerator is a 215-MV linear accelerator which can deliver a range of ions at a beam power of 100 kW (beam currents of 1 mA for protons, 0.5 mA for deuterons, 0.25 pmA for alphas, 0.08 pmA for ^{12}C , and 0.06 pmA for ^{18}O).

Ion source configurations are based on the concepts and extensive experience gained at ISOL-type facilities (in particular at ISOLDE at CERN). In addition, the facility includes a high-resolution isobaric-mass separator, followed by a new low-q/m, low-velocity accelerator section, 90% of which is directly based on existing ATLAS superconducting technology. The beams are then either used directly after the ion source (for research with ion traps), after low-energy acceleration up to ~ 1 MeV/u (for experiments in nuclear astrophysics), or injected into the existing ATLAS facility for acceleration to energies above the Coulomb barrier (for studying nuclear reactions and structure).

The initial estimates of effort, timelines, and cost suggest that the facility discussed here could be built in a three-year construction period, following a two-year detailed facility design, at a cost of \$109M in FY 1995 dollars. From our calculations of production yields and from beam extraction efficiencies which are based on experience at existing ISOL laboratories, such a facility would cover the physics goals set forth in the ISL White Paper. It will exceed the intensities specified in the White Paper for the largely unexplored region of neutron-rich nuclei, while providing approximately the intensities envisioned for proton-rich species. The cost is several times less than that of the concept tentatively adopted in the White Paper and represents a cost-effective and versatile scheme to address this exciting new domain of nuclear physics research.

A working paper "Concept for an Advanced Exotic Beam Facility Based on ATLAS" was prepared which summarizes the current status of discussions within the community of scientists involved with ATLAS, and others interested in this area of research, on the physics case for radioactive beams and on the novel technical concept for a facility with substantial capabilities incorporating ATLAS. Copies of this working paper are available on the World Wide Web under URL: "<http://www.phy.anl.gov>".

IV. PROGRAM ADVISORY COMMITTEE

The ATLAS Program Advisory Committee is scheduled to meet on May 26 and 27, 1995 to recommend experiments for running time.

The present Program Advisory Committee members are:

David Church	Texas A&M University
Cary Davids	ANL
David Fossan	SUNY @ Stony Brook
Paul Kienle	T. U. Muenchen
Mark Riley	Florida State University
Michael Wiescher	University of Notre Dame
Frank Wolfs	University of Rochester

The Committee is chaired by John Schiffer.

V. ATLAS EXECUTIVE COMMITTEE

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

Frank Wolfs (Chair)	University of Rochester
Partha Chowdhury	Wellesley College
John Fox	Florida State University
Lee Riedinger	University of Tennessee

Frank Wolfs can be reached on INTERNET at wolfs@nsrl31.nsrl.rochester.edu. Users are encouraged to communicate with the Executive Committee about ATLAS issues.

VI. ATLAS AND ANL PHYSICS DIVISION ON THE WORLD WIDE WEB

News and information about the Argonne Physics Division and the ATLAS Facility are now available on the World Wide Web. We can be reached from the ANL Home Page at <http://www.anl.gov/> or directly from the Physics Division Home Page at <http://www.phy.anl.gov/>. ATLAS news can be accessed from the Physics Division Home Page. The ATLAS pages include news about the facility, and User information. The currently available information includes news about the Program Advisory Committee and User Group Executive Committee, and current and past schedules. Future planned additions will include the ATLAS Users Handbook and study guides for ATLAS training. Ideas for additional information that may be useful can be sent to Bruce Glagola (glagola@anlphy.phy.anl.gov).