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## ATLAS Call for Proposals

### Proposal submission deadline: Monday, March 1, 2021

Dear ATLAS Users,

This is a call for proposals for experiments at ATLAS, for the scheduling period beginning in the summer of 2021. The ATLAS Program Advisory Committee (PAC) meeting will be held March 31-April 1, 2021.

Please note that this is a **call for proposals for all experiments using stable beams, radioactive beams produced by the in-flight facility RAISOR, low-energy and reaccelerated radioactive beams from the CARIBU source, and some long-lived radioactive beams such as  $^{14}\text{C}$ . Note also that this call covers part of the GRETINA campaign at ATLAS which starts in February 2021.**

During this PAC cycle, GRETINA will be available for experiments in campaigns in stand-alone mode, coupled to the FMA, or coupled to auxiliary detectors such as CHICO-2 and GODDESS. Gammasphere will be available for experiments in campaigns coupled to AGFA or in stand-alone mode. The AGFA gas-filled spectrometer is fully operational and is available for experiments. RAISOR is also operational and the secondary beams from this facility are available with instruments in experimental areas III and IV. Note also that deuterium beams will soon become available and will be considered for this PAC.

Typical beams and intensities available from RAISOR and CARIBU are presented at <https://www.anl.gov/atlas/available-beams>. For the newly available in-flight beams from the RAISOR facility, the secondary beams have been classified in the table as “available” or “expected” with the “available” beams having already been developed (or similar enough to beams that have been developed so that yield and purity can be accurately predicted) and the “expected” beams having more uncertainty. Experiments requesting “available” beams can be approved as Priority I by the PAC. Experiments requesting “expected” beams should include a two-day development period and can be approved as Priority II. The two-day development period will be run first if the beamtime is approved to confirm yield and purity. The actual experiment will only be scheduled after the beam is demonstrated. Experiments requesting RAISOR beams not listed in the table will be treated as letters of intent requesting the development of these beams. These should preferably be discussed with the RAISOR experts

before submission. For the CARIBU beams, the  $^{252}\text{Cf}$  source currently available to produce the neutron-rich isotopes yields lower production than what has been available in the past. While we are trying to secure a stronger source in the spring of 2021, we have lowered the expected intensities to be used for planning experiments until a new source is available. These lower intensity guidelines are available on the website listed above. More neutron-rich isotopes, not listed in the posted table for CARIBU beams, are also available at lower intensity for low-energy experiments; Users planning experiments with these more difficult beams should contact G. Savard ([savard@anl.gov](mailto:savard@anl.gov)) or D. Santiago-Gonzalez ([dsg@anl.gov](mailto:dsg@anl.gov)) for additional information. The reaccelerated CARIBU beams are provided through the EBIS charge-state breeder which removes the significant stable beam contamination that was generated in the previously used ECR charge-state breeder. Experiments no longer have to consider such contamination in their proposal; however, radioactive isobar contamination should still be considered in the proposals. Low-energy CARIBU beams can now be delivered to the new low-background experimental area for decay spectroscopy either directly at the intensity given in the table, or through the MRTOF which makes the beam essentially pure but at the cost of a factor of 3 to 5 in intensity.

**Please remember that, at the request of the PAC, some specific requirements for proposals have been implemented (see below). Please take them into account while preparing your submissions.**

Some of the experiments that received "Priority II" approval could not be scheduled in the period since the last PAC meeting because of the reduced running to the COVID pandemic and the heavy pressure for beam time when the facility was operational. This approval does carry over one more PAC cycle. Such proposals will, however, have to be resubmitted for consideration by a future PAC if they have not yet been scheduled and beam time is still desired.

### **Format of Proposals:**

The proposals to the PAC must be submitted electronically. The instructions for filling out the web-based form can be found at <https://www.anl.gov/atlas/proposals>.

To request beam time, please complete the web-based form and write a description of the proposed experiment summarizing the scientific justification, motivation, feasibility, and relevant technical and safety information. The proposals can be sent electronically as an e-mail attachment to [atlas-proposals@anl.gov](mailto:atlas-proposals@anl.gov) in either (I) Portable Document Format (.pdf), (II) Postscript format (.ps), or (III) in Microsoft Word.

*Contents of the Form:* The ATLAS Proposal Form needs to be completed for a successful submission of a proposal. It can be accessed on the web at <https://www.anl.gov/atlas/proposals>. On the proposal form, **please list the maximum beam energy and current you require**. This essential information is needed for radiation safety calculations. Also, beam tuning will be based on these upper limits. An increase in energy above the stated maximum or a change in beam species requires prior notice. Finally, by clicking the "submit" button in the web-based form, **you are certifying that all collaborators listed on your proposal are fully aware of the proposal and have agreed to participate in the experiment.**

*Contents of Proposals:* The proposals should be self-contained; including a **list of participants**, an **abstract**, the **basic physics goals** of the experiment, a **discussion of what exactly will be done** in the measurement, and any pertinent **references**. Sufficient technical details of the proposed measurement and count-rate estimates should be included for the PAC to be able to judge feasibility and the scope of the measurement, and impact on available ATLAS resources in terms of workforce and hardware. **The PAC requests that the proposals be kept to a reasonable length, 5 pages maximum plus figures and appendices. It is to be presented in single-column format (i.e., a full Phys Rev C length article in two-column format is not acceptable), with fonts no smaller than those in this letter (12 pt).**

**In your proposal, please summarize the results of previous experiments by the group** and indicate the status of the data analysis and publication. This information will be taken into account during the PAC assessments.

**Please indicate also whether the proposal is part of a PhD thesis project.** A question to this effect has been added to the proposal fact sheet.

## Background Information

*Beam Species:* The beams that are routinely available from ATLAS are presented on the ATLAS web page at <https://www.anl.gov/atlas/stable-beams> . They range from  ${}^7\text{Li}$  to  ${}^{238}\text{U}$ . Other beams are possible, after some development, and their feasibility should be discussed with the ATLAS Operations Group before a proposal is submitted.

*Beam Isotope:* The beam currents for elements listed in the table of available beams were obtained using natural material. Other isotopes are available with currents generally proportional to their abundance. Any special preparation that may be needed should be discussed with the ATLAS Operations Group prior to submission of the proposal. The practicality of a beam may be a consideration in the approval of a proposal.

*Radioactive Beams:* The radioactive beams produced by the in-flight technique are listed on the ATLAS web page at <https://www.anl.gov/atlas/inflight-radioactive-beams> . The contact persons for additional information are Calem Hoffman ([crhoffman@anl.gov](mailto:crhoffman@anl.gov)) or Clay Dickerson ([cdickerson@anl.gov](mailto:cdickerson@anl.gov)). For low-energy and reaccelerated CARIBU beams, a yield table for the beam intensities to be used for experiment planning is posted at <https://www.anl.gov/atlas/caribu-beams> . The contact persons for additional information are Daniel Santiago-Gonzalez ([dsg@anl.gov](mailto:dsg@anl.gov)) or Guy Savard ([savard@anl.gov](mailto:savard@anl.gov)).

*Experimental Equipment:* General information on experimental equipment can be found in the ATLAS Instrumentation page (<https://www.anl.gov/atlas/instrumentation>). Other equipment is also available for potential Users, and there are general-purpose beam lines for additional scattering chambers or other non-standard equipment. For the current status of a specific experimental station, please contact any one of the Laboratory staff members or the user liaison physicist Daniel Santiago-Gonzalez ([dsg@anl.gov](mailto:dsg@anl.gov)).

HELIOS: the **HELIOS** spectrometer for measurements of reactions in inverse kinematics has been developed by the University of Western Michigan, University of Manchester, Argonne National Laboratory collaboration. Scientists interested in using the device are requested to contact the representative of the collaboration, Ben Kay ([kay@anl.gov](mailto:kay@anl.gov)), to discuss the feasibility of a measurement.

Gammasphere and FMA: **Gammasphere** and the **FMA** are complex instruments that may be used combined or separately in experiments. There are a number of options for their utilization. Details concerning Gammasphere can be found at the following web-site: <https://www.anl.gov/phy/gammasphere> or by directly contacting Mike Carpenter ([carpenter@anl.gov](mailto:carpenter@anl.gov)); FMA details are at <https://www.anl.gov/phy/fragment-mass-analyzer> or by contacting Darek Seweryniak ([seweryniak@anl.gov](mailto:seweryniak@anl.gov)).

GRETINA: **GRETINA** will be hosted by ATLAS starting in the fall of 2020 and be available for experiments during this PAC cycle. For details concerning experiments using GRETINA, please contact Mike Carpenter ([carpenter@anl.gov](mailto:carpenter@anl.gov)).

AGFA: The **AGFA** gas-filled spectrometer is a new instrument that is installed on the APEX beamline and is available to operate in conjunction with **Gammasphere** or in stand-alone mode. AGFA details are at <https://www.anl.gov/phy/argonne-gasfilled-analyzer> or by contacting Birger Back ([back@anl.gov](mailto:back@anl.gov)) or Darek Seweryniak ([seweryniak@anl.gov](mailto:seweryniak@anl.gov)).

MUSIC: The MUlti-Sampling Ionization Chamber (MUSIC) is an active target system typically used to measure fusion cross sections or reactions of interest in Nuclear Astrophysics. Users interested in using this device may contact Melina Avila ([mavila@anl.gov](mailto:mavila@anl.gov)) to discuss the feasibility of their experiment.

CHICO-2 and GODDESS: Large community instruments such as **CHICO-2** and **GODDESS** will be used in extensive campaigns with **GRETINA** during this PAC cycle. Groups interested in performing experiments using these devices should contact, as quickly as possible, the points-of-contact of the collaborations responsible for these devices: Steve Pain ([painsd@ornl.gov](mailto:painsd@ornl.gov)) for **GODDESS** and Ching-Yen Wu ([wu24@llnl.gov](mailto:wu24@llnl.gov)) for **CHICO-2**.

Access to Experiments with Beam: The ATLAS Radiation Interlock System (ARIS) is designed so that for low-level radiation, where appropriate conditions are satisfied, access to the experiment is possible during the course of a measurement. For more information on ARIS please contact the user liaison physicist Daniel Santiago-Gonzalez ([dsg@anl.gov](mailto:dsg@anl.gov)).

## Program Advisory Committee

PAC membership. The present PAC membership is: Gordon Ball (TRIUMF), Roderick Clark (Lawrence Berkeley National Laboratory), Aaron Couture (Los Alamos National Laboratory),

Alison Laird (University of York), Thomas Papenbrock (University of Tennessee), Darek Seweryniak (Argonne National Laboratory), Nicholas Scielzo (Lawrence Livermore National Laboratory) and Kelly Chipps (Oak Ridge National Laboratory) as Chair of the ATLAS Users Group.

Please feel free to contact Filip Kondev ([kondev@anl.gov](mailto:kondev@anl.gov)) or Daniel Santiago-Gonzalez ([dsg@anl.gov](mailto:dsg@anl.gov)) with any questions. Web-based submissions must be received before midnight central time on **March 1, 2021**.

Confirmation of the reception of your proposal should reach you via email by March 2, 2021. We are looking forward to exciting proposals for research at ATLAS.

Sincerely,

A handwritten signature in black ink, appearing to read "Guy Savard". The signature is fluid and cursive, with a long horizontal stroke at the end.

Guy Savard  
ATLAS Director