

# Postdoctoral Appointment: Machine-Learning-Based In-Flight Beam Optimization (Argonne National Laboratory)

## Description

An exceptional researcher is sought to lead the development and implementation of an automated optimization system for the delivery of secondary beams produced in-flight at the recently upgraded [ATLAS In-Flight Facility](#). The successful candidate will join the low-energy nuclear physics group and coordinate with a small team of scientists and ATLAS Facility staff to complete the machine-learning (reinforcement learning) based optimization system. Various aspects of the project include, heavy-ion beam diagnostics hardware, working with accelerator components and control systems, and practical applications of optimization and machine learning techniques. The position also offers some portion of the candidates time for their own individually driven research interests.

The Low-Energy Nuclear Physics Research Group (LER) of the Physics Division at Argonne National Laboratory performs world-leading research in nuclear structure, nuclear astrophysics, fundamental symmetries, and nuclear data. The Group also manages and operates world-class detector systems as part of the ATLAS accelerator facility, a DOE supported national user facility for low-energy nuclear physics research. Information on the activities of the Group and the Division can be found at <https://www.anl.gov/phy>. Any questions regarding the position should be directed to Dr. Calem R. Hoffman ([crhoffman@anl.gov](mailto:crhoffman@anl.gov)).

## Candidate Profile

Top candidates for the position will have overlap with the following qualifications:

- A recent Ph. D. in Nuclear Physics, Accelerator Physics, Applied Mathematics or a related field.
- Familiarity with particle accelerators and ion-optics calculations and/or simulations.
- Experience in the detection and delivery of heavy-ion beams and/or charged particles.
- Interest and/or experience with machine learning approaches, specifically to problems involving optimization.

## Offer & Application

The appointment will be for one year, with the possibility of yearly extensions for up to 3 years, depending on funding availability and performance. The envisioned start date could be immediate through Summer 2022. Interested applicants should submit their CV and a one-page research statement at <https://www.anl.gov/hr/external-applicants>: requisition #411602. In addition, the candidate should arrange for three letters of reference to be sent to Dr. Calem R. Hoffman ([crhoffman@anl.gov](mailto:crhoffman@anl.gov)). Review of applicants will begin in earnest on November 1, 2021, and will continue until the position is filled.

As an equal employment opportunity and affirmative action employer, and in accordance with our core values of impact, safety, respect, integrity and teamwork, Argonne National Laboratory is committed to a diverse and inclusive workplace that fosters collaborative scientific discovery and innovation. In support of this commitment, Argonne encourages minorities, women, veterans and individuals with disabilities to apply for employment. Argonne considers all qualified applicants for employment without regard to age, ancestry, citizenship status, color, disability, gender, gender identity, genetic information, marital status, national origin, pregnancy, race, religion, sexual orientation, veteran status or any other characteristic protected by law.

Argonne employees, and certain guest researchers and contractors, are subject to particular restrictions related to participation in Foreign Government Sponsored or Affiliated Activities, as defined and detailed in United States Department of Energy Order 486.1A. You will be asked to disclose any such participation in the application phase for review by Argonne's Legal Department.