



# Two Post-Doc Positions at BNL in the ATLAS Experiment

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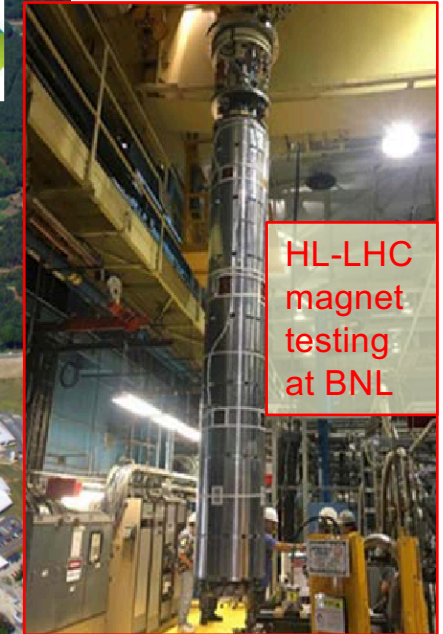
May 3, 2023

LHC Job Matching Event (JMEv) Spring '23



# Working at BNL

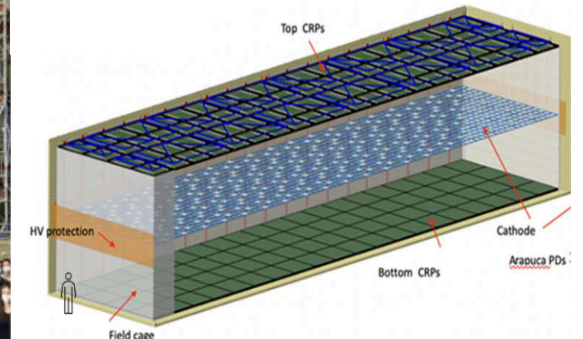
- **Brookhaven National Laboratory** ([www.bnl.gov](http://www.bnl.gov)) delivers discovery science and transformative technology
- BB=NL is a multidisciplinary laboratory with **7 Nobel Prize-winning discoveries**, **37 R&D 100 Awards**, and more than **70 years of pioneering research**.
- The Omega Group in the Physics Department at BNL
  - ATLAS experiment at the LHC.
  - We have a strong physics program concentrated on
    - Measurements of **Standard Model** processes (Electroweak, Higgs, QCD)
    - **Searches** for new physical phenomena (involving Higgs, dark matter, supersymmetry, and exotics).
  - The Omega Group has major responsibilities
    - Operation of the **ATLAS Liquid Argon calorimeter**, **Trigger/Data Acquisition**, and **software development**,
    - leading roles in the **ATLAS HL-LHC upgrade** (Silicon Strip detector, Liquid Argon calorimeter, and Trigger/Data Acquisition).
  - Strong detector R&D programs on silicon detectors and in Trigger/Data Acquisition.
  - Host laboratory for the *U.S. ATLAS Operations Program*, the *U.S. ATLAS HL-LHC Upgrade Project*, the *ATLAS Tier-1 computing facility*, and is an active *U.S. ATLAS Center*.



Construction of Muon system at CERN



Dune Module 2 Design



# Position #1 – Applied Post-Doc for ATLAS Silicon Det. (Req#3696)

- Construction of the **silicon strip detector, ITk**, for the **ATLAS HL-LHC Upgrade**.
- Leading role in the **production of staves for the barrel ITk strip system**: quality control and technically demanding aspects of construction
- **Two cleanroom facilities at BNL**: electrical and data acquisition testing of staves, operation of high-precision assembly systems, optical and laser metrology systems, test results analysis, uploading of test results to a database and bookkeeping.
- Contributions to *detector integration, installation, and commissioning activities are foreseen*.
- **Team of physicists, engineers, postdocs, students, and technicians**.
- High level of interaction with an international and multicultural scientific community.

## **Essential Duties and Responsibilities:**

- Contribute to construction, testing, and data quality assessment of a large silicon-strip tracking detector for the ATLAS HL-LHC Upgrade (ITk)
- Troubleshoot and solve technical, logistical, organizational, and software-related problems
- Communicate effectively with the ITk team at BNL as well as national and international ITk collaborators in ATLAS

**LOCATION: BNL**

Consideration of applications started on **April 15, 2023** and continue until the position is filled.

## **Required Knowledge, Skills, and Abilities:**

- Ph.D. in experimental particle, nuclear or applied physics, or in a related engineering discipline
- Experience with detector testing, construction, commissioning, operations or R&D
- Experience in programming (e.g. Python, C++) and operating Linux and Windows OS
- Good organizational and team-working skills
- Ability to work in a large international collaboration
- Clear and concise verbal and written communication skills
- Proven ability for disseminating research results by writing manuscripts and giving academic presentations

## **Preferred Knowledge, Skills, and Abilities:**

- Experience with silicon detector testing, construction, commissioning, operations and/or R&D
- Experience with data acquisition systems and detector electronics
- Experience interfacing with databases
- Experience working in collaboration with technicians and engineers
- Experience with data analysis and knowledge of statistical techniques for data analysis

## **Electronic Application:**

<https://jobs.bnl.gov/job/upton/applied-post-doc-for-atlas-silicon-detector/3437/46585531424>

# Position #2 – Post-Doc for HEP (Req#3756)

- Join the ongoing effort on the **ATLAS experiment** and to contribute to the establishment of a program of *Higgs boson property studies* at a **prospective Higgs Factory to inform detector development and optimization**.
- Collaborate with other BNL groups, engage in outreach, DEI initiatives, and scientific service.
- High level of interaction with an international and multicultural scientific community.

## **Essential Duties and Responsibilities:**

- Participation in ATLAS physics analysis, specifically in the electroweak or Higgs sectors
- Development of Higgs boson property studies at a prospective Higgs Factory
- Publish results of research and development in peer-reviewed journals and conduct presentations

**LOCATION: BNL or CERN**

## **Required Knowledge, Skills, and Abilities:**

- Ph.D. in experimental particle or nuclear physics
- Experience with data analysis and knowledge of statistical techniques for data analysis
- Experience in detector performance or trigger systems for high energy or nuclear physics experiments
- Ability to work in a large international collaboration
- Hands-on problem solving skills and clear and concise verbal and written communication skills
- Demonstrated track record of publication of research in high quality peer-reviewed journals and delivery of presentations

## **Preferred Knowledge, Skills, and Abilities:**

- Physics analysis with LHC data
- Experience with machine learning techniques and tools
- Experience with detector R&D and/or construction
- Experience with computing & software development

Consideration of applications will begin **June 30, 2023** and continue until the position is filled.

## **Electronic Application:**

<https://jobs.bnl.gov/job/upton/post-doc-for-high-energy-physics/3437/48049124400>

# About both positions

- Domestic and international **travel** should be expected
- Initial 2-year term appointment subject to renewal contingent on performance and funding
- BNL policy requires that after obtaining a PhD, eligible candidates for research associate appointments may **not exceed a combined total of 5 years of relevant work experience as a post-doc and/or in an R&D position**, excluding time associated with family planning, military service, illness or other life-changing events

- Electronic application including **cover letter, CV, and Research Statement** as Word documents or PDF.
- **Three letters of recommendation** sent to [physicsLOR@bnl.gov](mailto:physicsLOR@bnl.gov) with a subject line referring to this job posting (position no. 1. Req# 3696; position no. 2. Req#3756) and cc: to Michael Begel ([begel@bnl.gov](mailto:begel@bnl.gov)).

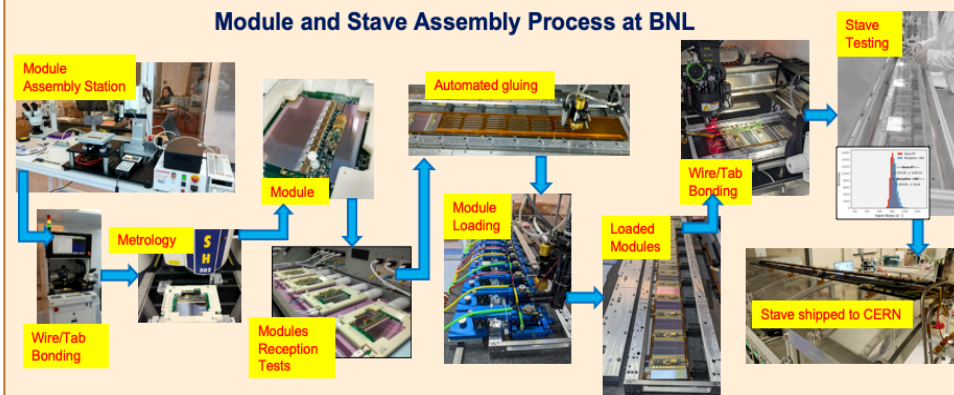
## Position no. 1. Applied Post-Doc for ATLAS Silicon Det.



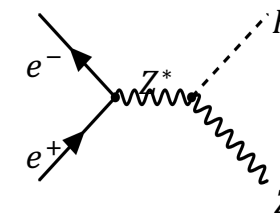
Class 10000 Clean Room for ATLAS ITk Strip Construction



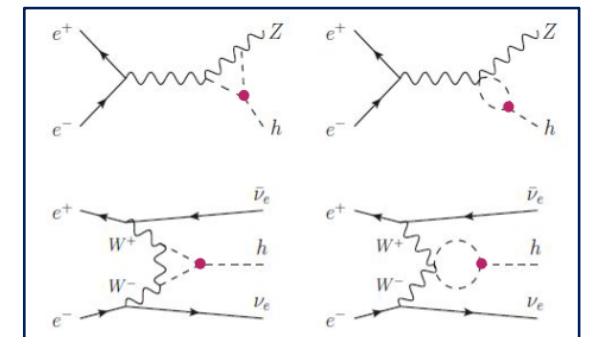
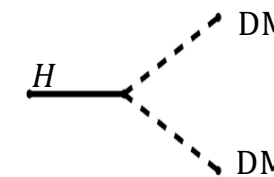
### Module and Stave Assembly Process at BNL



## Position no. 2. Post-Doc for HEP



$$\begin{aligned}
 e^+e^- &\rightarrow Z(\nu\nu)H(bb) \\
 e^+e^- &\rightarrow Z(\nu\nu)H(c\bar{c}) \\
 e^+e^- &\rightarrow Z(\nu\nu)H(gg) \\
 e^+e^- &\rightarrow Z(\nu\nu)H(s\bar{s}) \\
 e^+e^- &\rightarrow Z(\nu\nu)H(\tau\tau)
 \end{aligned}$$



FCC workshop at BNL, April 2023: <https://indico.cern.ch/event/1244371/>