Contribution ID: **90** Type: **Oral**

Towards Automated Large-Scale Facilities at Rutherford Appleton Laboratory

Thursday, November 13, 2025 11:00 AM (20 minutes)

Modern large-scale research facilities generate vast amounts of data and rely on highly complex systems whose operation has traditionally depended on human expertise and manual tuning. As these facilities grow in scale and complexity, there is an increasing need for intelligent approaches that can automate calibration, diagnostics, and decision-making, enabling more efficient and adaptive operations.
At the Rutherford Appleton Laboratory, we are developing AI-driven methods to support this vision of smart facilities. These include the use of surrogate models and optimization techniques to accelerate tuning and diagnostics in particle accelerators, as well as ongoing efforts to extend similar approaches to imaging and laser facilities. By integrating machine learning with domain expertise, these methods aim to improve efficiency, adaptability, and predictive capabilities across different facility environments.
This talk will highlight case studies from Rutherford, showing how AI can transform the way large-scale facilities are operated, paving the way for more automated, reliable, and intelligent scientific infrastructure.

Paper submission Plan

No

Best Presentation

No

Primary author: CHA, Jaehhon (Science and Technology Facilities Council)

Co-authors: Prof. THIYAGALINGAM, Jeyan (Science and Technology Facilities Council (STFC)); Dr LIU, Xingchi (Science and Technology Facilities Council (STFC))

Presenter: CHA, Jaehhon (Science and Technology Facilities Council)

Track Classification: ICABU: Working group 2: Beam physics, diagnostics and novel techniques