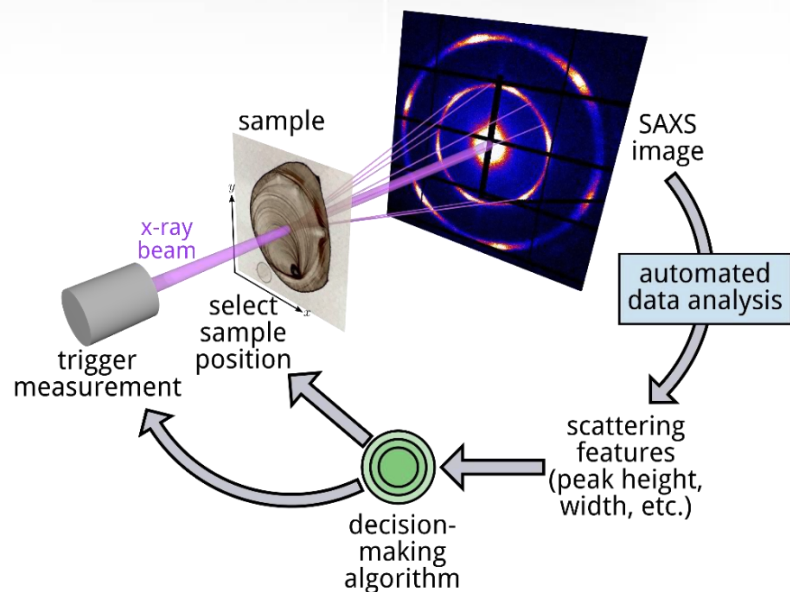# Smarter Experiments for Faster Materials Discovery

The developed algorithm receives real-time analyzed data from the last measurement step, adds this data to its model, calculates the best next step, and sends its decision to the beamline to execute the next measurement.

M. M. Noack, K. G. Yager, M. Fukuto, G. S. Doerk, R. Li, J. A. Sethian, *Scientific Reports* **9**, 11809 (2019).

Work was performed in part at Brookhaven National Laboratory

Scientific Achievement

Scientists created and tested a new algorithm, a form of artificial intelligence (AI), that can make autonomous decisions to define and perform the next step of an experiment without human interaction at a x-ray scattering instrument.

Significance and Impact

By improving the way researchers do their experiments, they are liberated from micro-managing their experiments and can tackle more complex challenges in a faster and more efficient way, leading to quicker materials discovery for new technologies.

Research Details

- The CMS beamline, operated in partnership between NSLS-II and CFN, was used for X-ray scattering experiments employing the algorithm that was developed by CAMERA at Berkeley Laboratory.
- The tests showed that the algorithm measured samples more efficiently than a traditional approach.