

Argonne's Battery Post-Test Facility

INCREASING THE LIFE OF BATTERIES

Did you know...

What happens to batteries as they age?

How do battery chemistries and materials change over time?

How can battery life be lengthened?

How can batteries be made safer to use?

OPPORTUNITY

In an age where everything from heart valves to smart phones to automobiles relies on battery power, these questions are vitally important. Argonne's Battery Post-Test Facility is discovering the answers.

ARGONNE'S SOLUTION

Argonne's new Battery Post-Test Facility (PTF) allows the lab's researchers to dissect, harvest and analyze battery materials from used and previously tested battery cells in order to identify for developers and manufacturers the exact mechanisms that limit the life of their battery cells. In the past, the cause of performance degradation could only be inferred. The PTF is one of the few facilities in the world conducting this research.

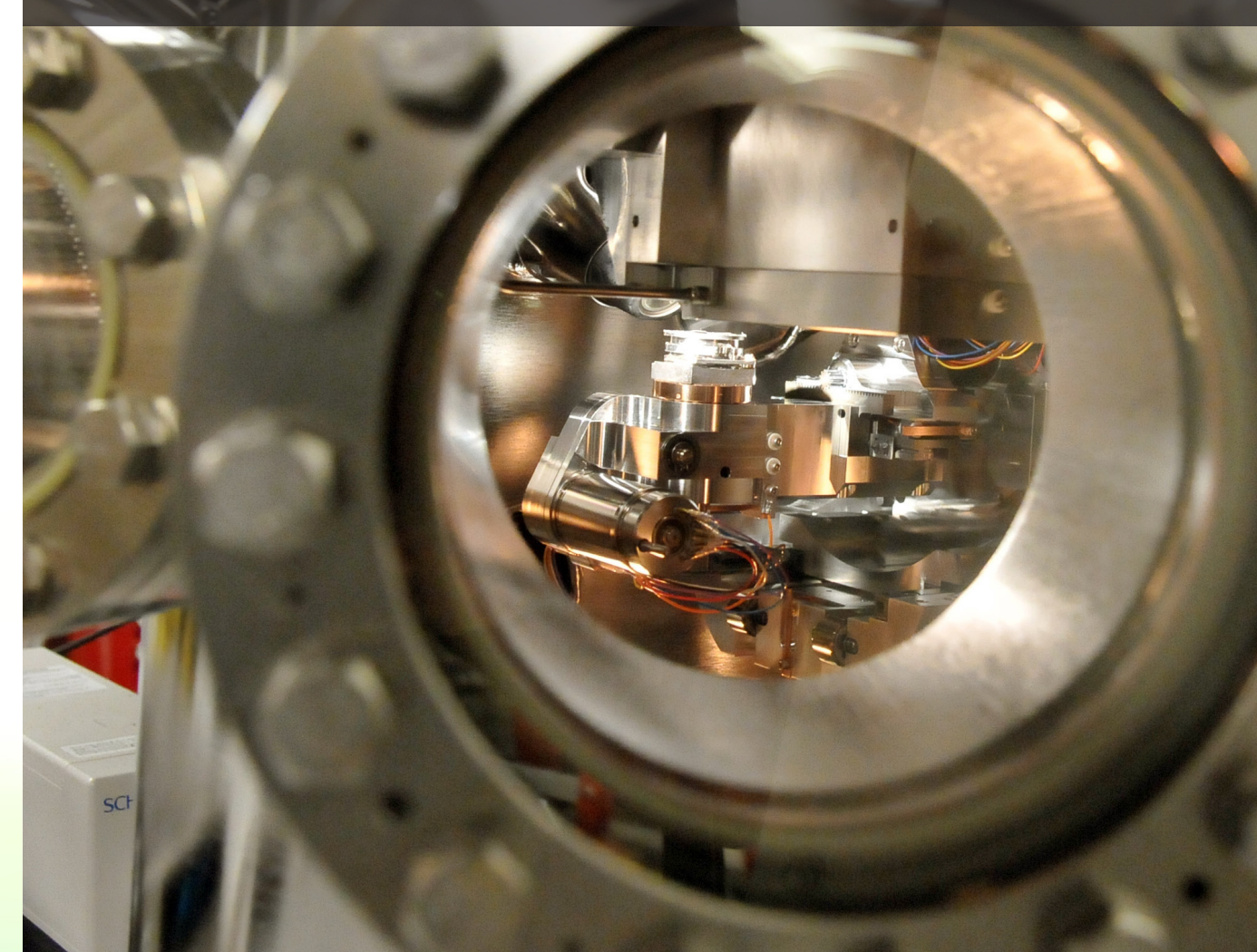
A UNIQUE FACILITY

The PTF is unique in that all its work, from dismantling the battery to harvesting and analyzing its components, is performed in one glove box. This keeps the air-sensitive battery materials pristine and intact, yielding more information about what's really going on in the later stages of characterization and analysis. An X-ray photoelectron spectrometer is integrated into the glove box and is used to gather data on the electronic structure of materials, which helps researchers learn what chemical and physical changes have occurred during the aging of battery materials. The PTF can be used to analyze materials from any type of battery, from lead-acid and lithium-ion (found in today's cars) to cutting-edge technologies, such as lithium-air.



Two Argonne scientists prepare a sample for characterization to answer the question of what changes occurred during the life of a battery.

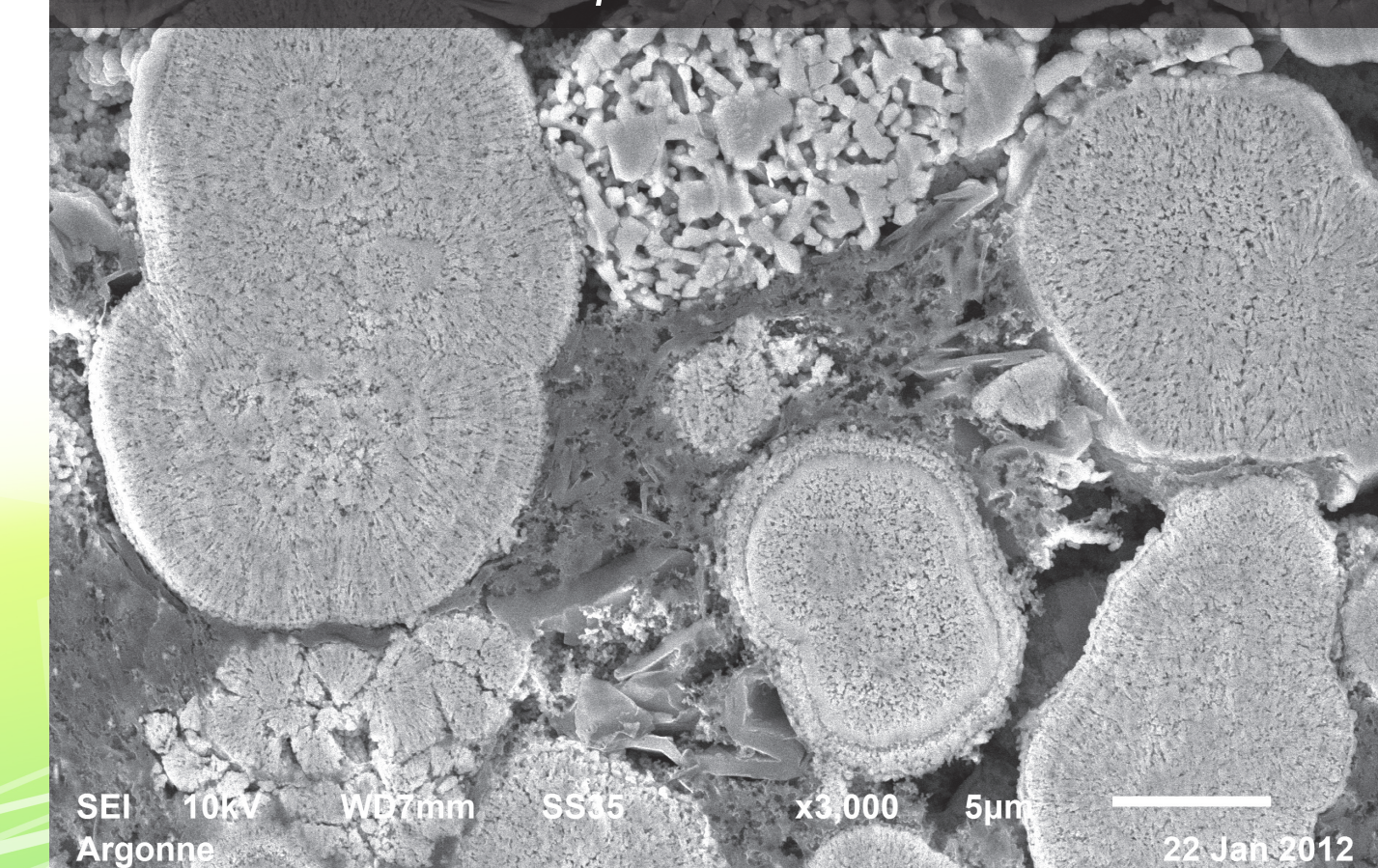
Getting ready for examination, a sample is loaded into the XPS.



Peering into another world, a sample is mounted in the XPS for characterization of the nature of what on the surface of a material.



Example results from the PTF show that battery materials are not simple.



The work in the PTF is funded by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy

