Tuesday Morning Break, September 23, 2025

Exhibitor Technology Spotlight Sessions
Room Hall A - Session EW-TuMB

Exhibitor Technology Spotlight Session I
Moderator: Christopher Moffitt, Kratos Analytical Inc

10:15am **EW-TuMB-2 New Developments for Surface Analysis from Thermo Fisher Scientific***, **Tim Nunney**, Robin Simpson, Paul Mack, Simon Bacon, Dhilan Devadasan,* Thermo Fisher Scientific, UK*; Charlie Chandler, Mark Baker,* University of Surrey, UK

In this presentation we will showcase the latest innovations in instrumentation for surface and materials analysis from Thermo Fisher Scientific, including a new instrument for improving capabilities for XPS depth profiling.

10:30am **EW-TuMB-3 Enviro Standard Analytical Tools: New Developments and Applications***, Francesca Mirabella, Stefan Böttcher, Paul Dietrich, **Andreas Thißen**,* SPECS Surface Nano Analysis GmbH, Germany

This presentation will focus on recent advancements and applications of our comprehensive surface analytical instrumentation the Enviro Standard Analytical Tools, with a particular emphasis on X-ray Photoelectron Spectroscopy (XPS) and Hard X-ray Photoelectron Spectroscopy (HAXPES). These techniques offer powerful insights into chemical composition, electronic structure, and buried interfaces. These tools have been integrated with additional modalities such as Scanning Electron Microscopy (SEM), Scanning Auger Microscopy (SAM), Ultraviolet Photoelectron Spectroscopy (UPS), and Inverse Photoemission Spectroscopy (IPES), enabling multi-faceted characterization from surface to subsurface to address complex analytical challenges. The talk will include a discussion of innovations in instrumentation and recent applications.

10:45am **EW-TuMB-4 Small Lab-Size Cryogen-Free Low Temperature SPM with Magnetic Field***, **Juergen Koeble**,* Scienta Omicron GmbH, Germany*; Andrew Yost,* Scienta Omicron Inc

The rising price of liquid helium increasingly and significantly adds to operational costs for low temperature SPM research. Recent advances in cryogenic technologies coupled with improvements in cooling power, temperature stability, and vibrational properties allow for integration into highly sensitive instruments such as scanning probe microscopes. Following scientific demands for nano-scale scanning probe microscopy, e.g. low temperature, optical and magnetic analysis, RF signaling, lowest drift, and signal-to-noise, we have developed a modular cryogen-free low temperature scanning probe microscope for STM and AFM in ultra-high vacuum. The new **ARCTIC** SPM represents the latest innovation in ultra-low-temperature scanning probe microscopy.

Built on our newly developed **ARCTIC** closed-cycle cooling platform, it combines cutting-edge technology with user-friendly operation. With the **ARCTIC** SPM LAB, you benefit from unattended, continuous cooling, eliminating the complexities of handling extreme temperatures while delivering virtually unlimited measurement time with stability traditionally only associated with liquid helium cryostat-based SPMs. The **ARCTIC** SPM also provides long-term stable low temperature operation of a dry superconducting magnet, and this new highly compact scanning probe microscope offers easy optical access for advanced optical experiments even in the presence of a high magnetic field.

Exhibitor Technology Spotlight Sessions
Room Hall A - Session EW-TuL

Exhibitor Technology Spotlight Session II
Moderator: Christopher Moffitt, Kratos Analytical Inc

12:30pm **EW-TuL-2 RHK Technology: 37 Years of Continuous SPM Innovation*, Adam Kollin,*** RHK Technology, Inc.

RHK Technology was founded in 1981 to develop new research tools for the Surface Science research community.The first product introduced was a High Resolution Electron Energy Loss Spectrometer (HREELS) followed by a Digital Temperature Controller for Temperature Programmed Desorption (TPD) measurements.RHK introduced its first Scanning Probe Microscope control system in 1988.In the following 37 years, RHK has developed a wide range of cutting-edge Scanning Probe Microscopes focused on UHV and cryogenic environments.The company is located in Troy Michigan and has delivered over 1500 SPM systems to over 40 countries around the world.

Adam Kollin, the founder and CEO of RHK Technology will discuss the latest advances from RHK including their new tenth generation SPM control system, the R10.Further advances in their cryo-free SPM system will be highlighted such as new Lumin-SLT that features a 70% light collection efficiency for Cathodoluminescence (CL) Photoluminescence (PL), STM Light Emission (STM-LE) as well as Raman spectroscopy studies.Upcoming capabilities will also be discussed.

12:45pm **EW-TuL-3 Kratos Axis Supra+ -- Automated Laboratory XPS Analysis*, Chris Moffitt,*** Kratos Analytical Inc.

As demand for surface analysis increases across materials systems, the automation of modern instrumentation provides broader access to more robust analyses, over larger sample sets, with advanced approaches.The Kratos Axis Supra+ multi-technique XPS system incorporates automated sample handling with automated analysis of XPS, UPS, depth profiling and others, including higher energy Ag-Lα generated, quantitative HAXPES, for increased depth analysis and clarification of chemical state.

The Axis Supra+ is uncompromised in its ability to analyze the wide range of new advanced materials, including operando surface analysis measurement of battery materials while biasing or flowing current and heating.The multi-contact stage in the Axis Supra$^+$ spectrometer accommodates the specialized holders for the operando analysis, supplying 4 electrical contacts to be used for these analyses, while still accepting all the standard sample platens for high throughput analysis. An inert sample transfer version of these multi-contact holders has also been developed, which allows the sample to be loaded onto the platen and electrical connections made in a glove box, and then loaded into the spectrometer without exposure to atmosphere.Cryo-cooling of battery and other materials has been shown to minimize degradation and chemical bonding damage that can be caused by x-ray exposure at room temperature, and Kratos offers new sample holder options that allow cooling of sample to cryogenic temperatures to mitigate chemical changes during XPS measurement, as well as measure biological samples after fast freezing onto a pre-cooled sample holder.

The Axis Supra+ allows more samples to be analyzed with the full capabilities of the highest-performing XPS instrument, without intervention.Once samples are physically loaded, analyses are submitted through the computer interface, utilizing multiple cameras for location identification, which can be done remotely.This same principle follows for utilizing the HAXPES mono source, so that analysis by standard Al-Ka monochromatic x-rays can be automatically followed by analysis with the higher energy Ag-La monochromatic source and the results automatically processed and quantified using new Data Dependent Acquisition software features.Additional analytical techniques, such as Ag-Lα HAXPES, ISS, UPS, AES, REELS and IPES are all possible on the Supra$^+$, and additional sample preparation chambers can be easily added, such as a station for deposition or the high-pressure, high-temperature gas reaction cell for catalysis experiments and measurement.

1:00pm **EW-TuL-4 Physical Electronics Spotlight Session: Driving Discoveries Through Surface Analysis: Innovative Technologies for Thin Film Characterization*, Amy Ferryman,*** Physical Electronics

Physical Electronics (PHI) offers the world's most complete portfolio of powerful surface analysis instruments, including X-ray photoelectron spectroscopy (XPS), Auger electron spectroscopy (AES) and secondary ion mass spectrometry (SIMS). Our innovative technologies provide unique tools to solve challenging problems, accelerating development and discovery of advanced materials and products. This presentation will highlight recent developments in methodologies for thin film characterization utilizing our automated PHI *Genesis* multi-technique XPS platform in combination with our powerful, next generation *Strata*PHI software package, a tool designed to calculate the thickness and structure of advanced multilayer thin film structures using spectral and angle-dependent XPS (ADXPS) and hard X-ray photoelectron spectroscopy (HAXPES) data.

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Bold page numbers indicate presenter