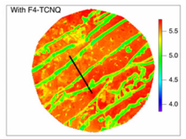
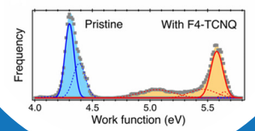
PEEM

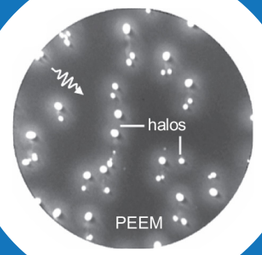
RESULT/APPLICATION





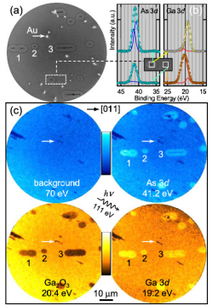
Work Function Imaging

Euaruksakul, C., Nakajima, H., Rattanachata, A., Hanna, M. Y., Nugraha, A., & Boutchich, M. (2020). Electronic and Thermoelectric Properties of Graphene on 4H-SiC (0001) Nanofacets Functionalized with F4-TCNQ. Journal of Electronic Materials, 49(11), 6872-6880.



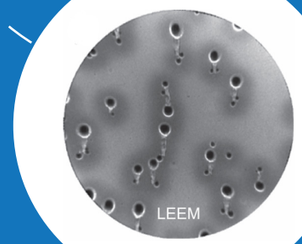
UV-PEEM

Kanjanachuchai, S., Wongpinij, T., Euaruksakul, C., & Photongkam, P. (2021). In situ observation and control of ultrathin In layers on sublimated InP (100) surfaces. Applied Surface Science, 542, 148549.



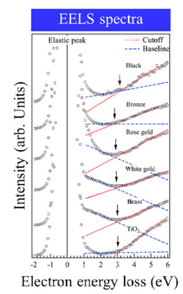
XPS Imaging

Kanjanachuchai, S., Wongpinij, T., Euaruksakul, C., & Photongkam, P. (2019). Au-catalyzed desorption of GaAs oxides. Nanotechnology, 30(21), 215703.



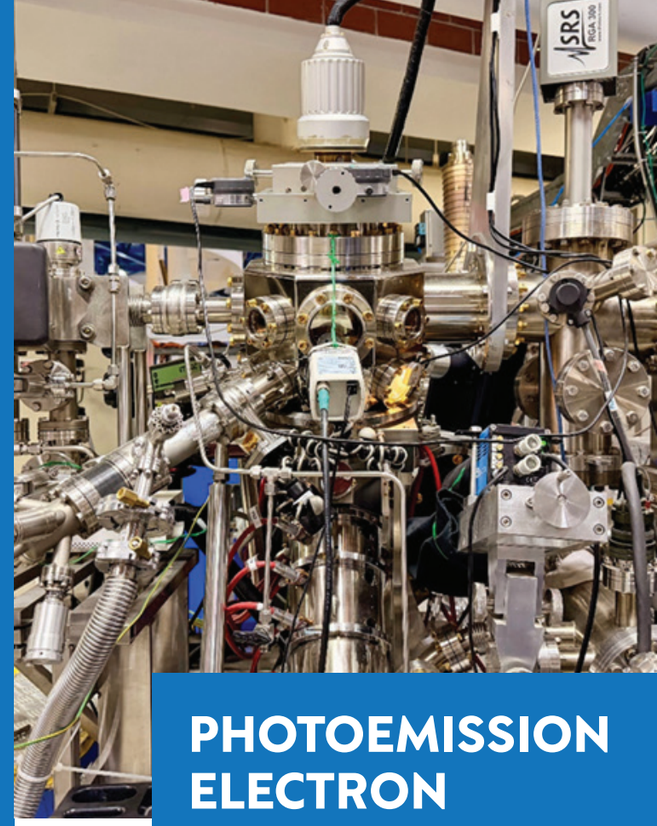
LEEM

Kanjanachuchai, S., Wongpinij, T., Euaruksakul, C., & Photongkam, P. (2021). In situ observation and control of ultrathin In layers on sublimated InP (100) surfaces. Applied Surface Science, 542, 148549.



EELS

Nakajima, Hideki, et al. "Spectroscopic analysis of color origins in titanium-based thin films deposited by cathodic arc deposition." Applied Surface Science 673 (2024): 160900.



PHOTOEMISSION ELECTRON MICROSCOPY (PEEM)

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(PUBLIC ORGANIZATION)

PRINCIPLE INFORMATION

In PEEM, the sample is irradiated with monochromatic light and the emitted photoelectrons processed with a set of electrostatic lenses. The electron optics are similar to those found in a scanning electron microscope. The final image is captured via a micro-channel plate intensifier and phosphorous screen. Imaging electrons are created by two processes: photoemission and photoabsorption. The emitted electron beam is magnified and projected onto a screen. By using electron energy analyzer, XPS spectra are acquired by plotting intensity vs. electron energy. By scanning photon energy (using synchrotron monochromator), XAS spectra are acquired by plotting intensity vs. photon energy.

The electron gun enables structural characterization of crystalline surfaces through Low Energy Electron Microscopy (LEEM), which is highly sensitive to surface topography, atomic step edges, and surface termination. LEEM is typically used to monitor real-time thin-film growth, structural domain formation, gas adsorption, and phase transitions.

In reciprocal space mode, the electron gun allows Micro Low-Energy Electron Diffraction (μ-LEED) from regions as small as 0.5 mm using an illumination aperture. By scanning the energy of the incident electrons, LEED intensity curves can be efficiently recorded. It is also possible to select an off-normal LEED spot to form LEEM images in dark-field mode, thereby enhancing contrast between structural islands

TECHNICAL SPECIFICATION

Category	Specification
Beamline	BL3.2U: PES/PEEM
Photon Energy Range	40–160 eV (G#1), 220–520 eV (G#2), 440–1040 eV (G#3) **Resolving Power:** 10,000 (Simulation) **PEEM Sources:** Synchrotron radiation, Hg UV lamp **LEEM Sources:** Electron gun (LaB6 thermionic emission) **Energy:** -10 to 500 eV
Photon Flux (Full beam)	$>10^{11}$ ph/s (60–520 eV) | $>10^{10}$ ph/s (40–60 & 440–1040 eV)
X-ray Beam Size	0.8 mm × 0.1 mm PEEM Model: Elmitec PEEM III Resolution: Image: 30 nm | Spatial: ~20 nm | Energy: ~0.3 eV
Detector	MCP with Sensicam QE CCD; Hemispherical electron energy analyzer
Sample Requirement	UHV compatible, conductive, flat and polished (max 10×10×2 mm^3) In-situ Capabilities: High-temperature annealing up to ~1500°C

SDGs SUPPORT



Advancing energy storage through electronic structure analysis



Driving nano-electronics & semiconductor development at the micro-scale



Characterizing soil organic carbon for carbon sequestration research

PEEM END STATION

