**POETS6-R-TempSensing_DL**

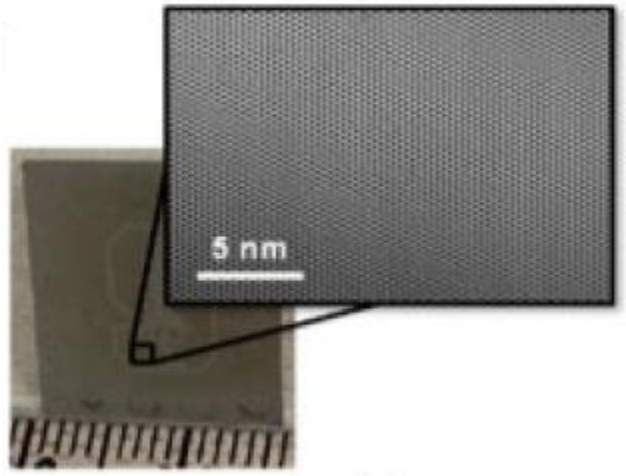
**Researchers Demonstrate Super-Thin Semiconductor Deposition for Temperature Sensing**

***Outcome/accomplishment:*** The first-ever demonstration of a large-temperature coefficient through a super-thin semiconducting layer was conducted by researchers at the Center for Power Optimization of Electro-Thermal Systems (POETS), an NSF-funded Engineering Research Center (ERC) based at the University of Illinois.

***Impact/benefits:*** No commercial product exists that can sense temperature changes with such atomically thin semiconducting materials. The work at POETS could enable condition-based monitoring and diagnostics of critical electronic components and help meet the need for novel electrical and thermal component designs for POETS testbed systems.

***Explanation/background:*** Temperature sensing is critical for numerous applications in electronics, including the suppression of thermal failures in integrated circuits. Traditional temperature sensors rely on thermocouples, resistors, or circuit-based sensors that cannot be placed with microscale precision and cannot respond to ultrafast temperature changes.

The POETS researchers demonstrated a novel transfer technique for two-dimensional semiconductor materials, resulting in a monolayer thickness of 0.6 nm. The technique incorporated contacts on polyimide substrates that will provide the basis for integration into power modules.




*A high-quality monolayer of molybdenum disulfide, a semiconductor similar to silicon. (Credit: POETS)*