**Global Research Outreach\_2025\_Call for Proposal**

**Theme: Semiconductor Metrology**

**- Sub-Theme: ML Based Semiconductor Process Signal Analysis**

**(Overcoming the resolution limitation of analysis signals caused by the physical constraints of semiconductor analysis tools through AI technology)**

In the field of semiconductor analysis, it is commonly divided into categories such as structural analysis, surface and material property analysis, and failure analysis. Various analysis tools are used to extract 1-D or 2-D signals for further interpretation, however, as semiconductor line widths continue to shrink, the resolution of analysis tool sees only marginal improvements due to physical limitations, leading to increasing difficulty in analysis. Therefore, it is necessary to improve the quality of analytical signals using AI. To accurately capture subtle process variations, it is essential to develop technologies that are precise, robust, and capable of real-time processing. In other words, we require new technique that can transform the signals in real-time to refine them for improved quality including resolution enhancement and noise removal. The following provides examples of analysis tools that aligns with our interests:

* Transmission Electron Microscope
* Scanning Electron Microscope
* Secondary Ion Mass Spectrometry
* Raman spectroscopy
* Optic Camera for OFI(Optical Fault Isolation)

※ *The topics are not limited to the above examples and the participants are*

 *encouraged to propose the original idea.*

※ *Funding: Up to USD 150,000 per year*