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

**Theme: Semiconductor Metrology**

**- Sub-Theme: Next Generation 3D Integration Imaging Analysis**

**(3D Characterization for Material Analysis: Next Generation Technique**

**Using X-ray/EUV Compact Source)**

Ultra-short light sources, including X-rays, are commonly employed for device material analysis techniques such as XRD, XPS, and XRM. However, laboratory-based sources are limited in both flux and energy due to their generation methods when compared to synchrotrons, which are large-scale facilities. Consequently, the development of compact synchrotron technology (a next-generation source) for internalization is becoming increasingly important. This novel source offers potential applications in performing non-destructive 3D imaging (Ptychography) and evaluating atomic bonding structures (Near edge X-ray absorption fine structure). We are mostly interested in fundamental research that solve problems due to the limit of laboratory-based source for analysis, such as but not limited to:

* Novel technique for 3D imaging for integrated circuits
* Next generation light sources which have higher resolution for XRD or XPS techniques compared to laboratory based source
* Non-destructive on-cell material characterization (strain, chemical bonding, oxidation state, and morphology) for disruptive semiconductor devices

※ *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*