

## **Theme: Semicon. Equipment**

### **- Sub theme: Machine-Learning-Assisted Plasma Processing**

In the semiconductor manufacturing, plasma processing is used in various processes such as extreme ultraviolet (EUV) lithography, dry etching, plasma-enhanced chemical vapor deposition (PE-CVD), and physical vapor deposition (PVD). However, it is not easy to diagnose the plasma in a chamber in the process, so experimental data-based analysis is very difficult. Therefore, many attempts are being made to use plasma simulations to analyze the characteristics of the plasma. However, there is also a problem that plasma simulations are very time-consuming and inconsistent. In addition, the correlations between the plasma characteristics predicted by simulation and the related process results such as etching/deposition rate and profile and macroscopic/microscopic uniformity are not fully understood yet. From this point of view, machine learning-based technologies that can simulate the characteristics of the plasma in a reasonable time and understand/control the hidden correlations of simulation results and related process results are required.

We are highly interested in (but not limited to) the following list of topics:

- Surrogate model of plasma processing/chamber
- Correlation analysis between plasma parameters and process results
- Machine-learning-assisted plasma simulation
- Machine-learning-assisted molecular/quantum dynamics

※ The participants are also encouraged to propose new ideas outside the topics listed above.

※ Funding: Up to USD 150,000 per year