Joint Technical Seminar Program

IEEE Nano & Joint EPS/CAS Oregon Chapters
IEEE/Nano Distinguished Lecture

Atomic Layer Etching, Deposition and Modification Processes for Future Nanoscale-devices

with

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Date/Time: October 15th, 2020 5-6:30 PM PT
Location: Virtual (WEBEX)
Register: https://meetings.vtools.ieee.org/m/xxxx

Abstract:
Advances in plasma process technology have contributed directly to advances in the miniaturization and integration of semiconductor devices. However, in semiconductor devices that encroach on the nanoscale domain, defects or damage can be caused by charged particles and ultraviolet rays emitted from the plasma, severely impairing the characteristics of nano-devices that have a larger surface than bulk areas. It is therefore essential to develop a method for suppressing or controlling charge accumulation and ultraviolet damage in plasma processing. The neutral beam process developed by the authors is a method that suppresses the formation of defects at the atomic layer level in the processed surface, allowing ideal surface chemical reactions to take place at room temperature. This technique is indispensable to develop future innovative nano-devices.

Biography:

Prof. Seiji Samukawa conducts research on ways to generate charged particles and neutral particles, and to associate acceleration technologies in reactive plasmas, as well as research on the flow of these particles and the latest bio-nano processes. Through these efforts, Prof. Samukawa is working to develop precise nanofabrication, highly functional thin films and various kinds of surface processing technologies. His goal is to realize "intelligent plasma nano-processes" through the fusion of physical experimentation and computer simulation.

Securing safe and cheap energy and using it effectively is a serious problem for modern society. As a solution to this, he is performing research on innovative green nanodevices. Prof. Samukawa is developing power generating devices, storage devices, low-power-consumption devices, multifunctional nano-devices and nano-energy systems that use these devices. To manufacture these nanodevices, it is necessary to be able to do so precisely without damaging the nanostructures and to derive the intrinsic characteristics of the nanomaterials and nanostructures. For the first time, such devices are made possible through the mastery of our unique intelligent nano-processes such as a super-low-damage neutral beam processes, pulsed plasma processes, and ultimate processing utilizing biotechnology.