FY 2019 Nanotech Career-up Alliance
Kyoto University, Introduction to Electron-beam Lithography

■ **Purpose:**
In the most-advanced semiconductor devices and MEMS, the requirement for nanoscale patterns have become important. The key technology to meet those requirement is the electron-beam lithography which can draw the fine patterns in the nanometer order.
This course is intended for the beginners of Electron-beam Lithography. The participants will learn the basic knowledge about the nanoscale patterning through the designing a nanoscale pattern by CAD, exposing the pattern on silicon wafers with oxide film by the most-advanced electron-beam lithography equipment, dry etching the pattern, and the observing the fabricated pattern with SEM.

■ **Number of participants:** 3 persons (maximum)

■ **Time and period:** From July 22 (Mon) to August 1 (Thu), 2019
4 days in total (lecture: 2 days [all participants]; practice: 2 days [individually])

■ **Venue:** Kyoto University Nanotechnology Hub (* Yoshida Campus, Kyoto University)
http://www.nanoplat.cpier.kyoto-u.ac.jp/access/

■ **Contents:**
Day 1 and Day 2 - July 22 (Mon) and July 23 (Tue)
[1] Fundamentals of electron-beam lithography (lecture) : For all the participants
*) The following schedule will be implemented for each participant for two consecutive days. Please note that the schedule is different for each participant. The specific schedule will be adjusted after the participation has been determined.

Day 3 - July 24 (Wed), July 29 (Mon) or July 31 (Wed)
[2] Pattern design by CAD (practice)
[3] Photoresist coating by spin coater (practice)
[4] Drawing patterns by an electron-beam lithography equipment (practice)

Day 4 - July 25 (Thu), July 30 (Tue) or August 1 (Thu)
[5] Development of drawing pattern (practice)
[6] Dry etching of oxide film (practice)
[7] Observation of fabricated structures by SEM (practice)
[8] Preparation of report

■ **Tuition:** 14,000 yen

■ **Contact:**
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