Koç University, **Heidelberg Instruments**, **and GenISys** invite the interested laser lithography community to join the free **Technical Workshop** on

Maskless Laser Lithography and Direct-Write Technologies for the Advanced Micro- and Nanofabrication

Date: May 7th, 2026 (9:00 h – 16:00 h) & May 8th, 2026 (9:00 – 13:00 h)

Venue: Koç University, Istanbul, Türkiye

Maskless laser lithography and direct-write technologies are key tools in research laboratories and small- to mid-volume microfabrication facilities worldwide. They enable rapid and flexible patterning for applications across MEMS, microfluidics, micro-optics, sensors, electronics, advanced packaging, and emerging quantum technologies.

This workshop provides an overview of maskless lithography with a focus on the Direct-Write Laser (DWL) systems and maskless aligners developed by Heidelberg Instruments, highlighting system capabilities, grayscale lithography, software environments, compatible materials, and user experiences from research and industrial settings.

In addition, the program will introduce **thermal scanning probe lithography (t-SPL)**—a powerful method for high-resolution nanolithography and thermal modification. Using a heated ultra-sharp probe tip with real-time closed-loop depth control, t-SPL enables the creation of arbitrary nanoscale structures on a wide range of substrates. NanoFrazor systems from Heidelberg Instruments now deliver lithographic resolutions down to 20 nm while achieving significantly higher throughput through parallelized t-SPL with multiple heated tips, Direct Laser Sublimation (DLS), and an advanced automation framework.

The workshop will also highlight complementary microfabrication technologies including **two-photon polymerization (2PP) 3D printing** for micro- and nanoscale structures using systems from Nanoscribe. This technique enables the fabrication of complex three-dimensional microstructures with sub-micron precision, supporting applications in micro-optics, metamaterials, biomedical devices, and advanced photonics.

Furthermore, participants will gain insight into **simulation, modelling, and proximity effect correction tools** for electron-beam and optical lithography using software solutions from GenISys GmbH. These tools play a critical role in optimizing pattern fidelity, improving process reliability, and accelerating nanofabrication workflows.

The program will also cover **advanced photoresists and lithographic materials**, including high-performance resists and process materials from micro resist technology GmbH that enable high-resolution patterning across multiple lithography platforms.

Designed for cleanroom managers, academic researchers, and industry users, this workshop offers deep insights into current advances, practical requirements, and fabrication strategies for **2D, 2.5D, and 3D micro- and nanostructures**.

A **hands-on training session** will be provided on **Day 1**, allowing participants to gain practical experience with selected systems and software tools.

Seats are limited. **Registrations will be confirmed on a first-come, first-served basis.**

Preliminary Agenda

Time	Day 1 May 7th, 09:00 – 16:00 (CET)
09:00	**Welcome** *Prof. Hakan Ürey, Koç University*
09:20	**Keynote: Nanofabrication for Nano-Photonics at Southampton University** *Prof. Martin Charlton, Southampton University*
09:50	**Bridging Research and Pilot Lines in the Turkish Context: Semiconductor Innovation at n2STAR** *Prof. Erdem Alaca, Koç University*
10:10	**Heidelberg Instruments – Solution Provider for R&D and Industry** *Muhammed Bekin, Heidelberg Instruments*
10:20	**Growing by Shrinking** *Nezih Unal, GenISys AS*
10:30	**Coffee Break**
11:00	**Expanding the Lithography Toolbox** *Vasilis Theofylaktopoulos., Heidelberg Instruments Nano AG*
11:30	**Pushing the Limits in Grayscale and Binary Laser Lithography** *Muhammed Bekin, Heidelberg Instruments*
11:50	**Two-Photon Polymerization for Maskless Lithography and 3D Printing on the Microscale** *Dr. Mina Yeşilyurt, Nanoscribe GmbH & Co. KG*
12:15	**Lunch Break**

13:00	**Metrology for Nano-Patterning: If You Cannot Measure It – You Cannot Improve It.** *Dmitri Titko, GenISys GmbH*
13:30 - 16:00	**Hands-on Training (Parallel Sessions)** ○ Maskless Lithography by Heidelberg Instruments ○ Two-Photon Polymerization by Nanoscribe ○ GenISys BEAMER Software at Koç University, n2STAR Cleanroom; number of participants limited, first in, first serve! ○ Online Demo NanoFrazor Nanolithography Tool
16:00	**End of Day 1**

	Day 2 **May 8th, 09:00 – 13:00 (CET)**
09:00	**Opening** *Muhammed Bekin, Heidelberg Instruments*
09:05	***Keynote: TBA*** *Dr. Armin Knoll, IBM Zurich*
09:35	***High-Throughput Lithography Approaches for High-Resolution Nanophotonics*** *Serap Aksu Ramazanoğlu, Koç University*
10:05	**Update on Highlights in Resist and Photopolymer Development for UV Direct Writing to Generate 2D, 2.5D and 3D Patterns** *Online: Anja Voigt, micro resist technology GmbH*

10:35	**Coffee Break**
11:00	**Photolitography Applications with Direct Writers in ASELSAN** *Olgu Demircioglu, ASELSAN*
11:30	**Comparative Study of One- and Two-Photon Grayscale Lithography for Micro-Optical Fabrication** *Online: Jonas Wiedenmann, Heidelberg Instruments*
12:00	**Wrap-up Session and Q&A**
13:00	**End of Day 2, End of Workshop**
	Guided tour @ n2STAR planned in the afternoon (flexible timing)