

## ***PRESS RELEASE***

FOR IMMEDIATE RELEASE

October 08, 2024

### **Heidelberg Instruments Launches New Modular and 10x Faster NanoFrazor Nanolithography Tool**

Zurich, Switzerland/Heidelberg, Germany — Heidelberg Instruments proudly announces the launch of its new NanoFrazor nanolithography system, advancing decades of expertise in micro- and nanofabrication. This versatile tool, designed for high resolution, flexibility, throughput and modularity, can be equipped with ten parallel patterning cantilevers, significantly boosting productivity. Combining Thermal Scanning Probe Lithography (t-SPL), Direct Laser Sublimation (DLS), and enhanced automation, the NanoFrazor supports cutting-edge research in quantum devices, 1D/2D materials, and nanoscale electronics, as well as applications in nanophotonics, meta-optics, and nanofluidics.

At the heart of the NanoFrazor is an ultrasharp, heatable probe tip, enabling precise patterning of nanostructures with lateral resolutions as fine as 15 nm and vertical resolutions down to 2 nm. Its in-situ inspection system offers Closed-Loop Lithography (CLL), allowing for markerless overlay and real-time adjustments to ensure sub-2 nm vertical precision for even the most complex grayscale patterns. This groundbreaking feature enables advanced applications in photonics, biomimetic substrates, and local material modification through heat-induced chemical reactions or phase changes.

#### Key Features:

- Thermal Scanning Probe Lithography (t-SPL): High-precision patterning for critical nanodevice components.
- Modularity: The NanoFrazor's configurable platform allows for tailored solutions based on application and lab requirements. Additional modules and upgrades can be installed as research progresses, offering flexibility and scalability.
- Resolution & Throughput: With the new Decapede module, throughput is increased tenfold by utilizing 10 independent thermal cantilevers, delivering speed without sacrificing resolution.
- Hybrid Mix & Match Lithography: The NanoFrazor supports a Direct Laser Sublimation (DLS) module for faster micrometer-resolution writing, making it ideal for large-area patterns like contact wires and pads.

Building on decades of R&D originating at IBM Research Zürich, the NanoFrazor continues to evolve at Heidelberg Instruments Nano. A comprehensive library of best practices in etching, lift-off, and other processes ensures that users can optimize their results across various applications.

For more information, visit our recent blogpost: [NanoFrazor - A New Generation of Thermal Scanning Probe Lithography \(heidelberg-instruments.com\)](https://www.heidelberg-instruments.com/blog/nanofrazor-a-new-generation-of-thermal-scanning-probe-lithography)

## **About Heidelberg Instruments**

Established in 1984, trusted in more than 50 countries with over 1,400 systems installed worldwide, Heidelberg Instruments is a global leader in the design, development, and production of high-precision laser lithography systems, maskless aligners, and nanofabrication systems, offering solutions from tabletop tools to high-end photomask manufacturing equipment. Our versatile systems enable micro- and nanoscale surface structuring, including 2D-patterning, 2.5D features via Grayscale lithography, and 3D structuring through Two-Photon Polymerization. Renowned universities, R&D institutes, and industry production facilities worldwide rely on our systems for applications in micro-optics, photonics, electronics, semiconductors, quantum devices, MEMS, microfluidics, 2D materials, and more.

### **Contact:**

Heidelberg Instruments Mikrotechnik GmbH


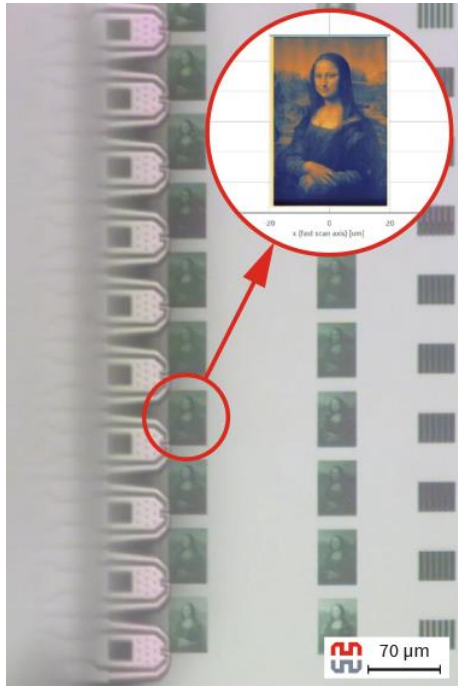
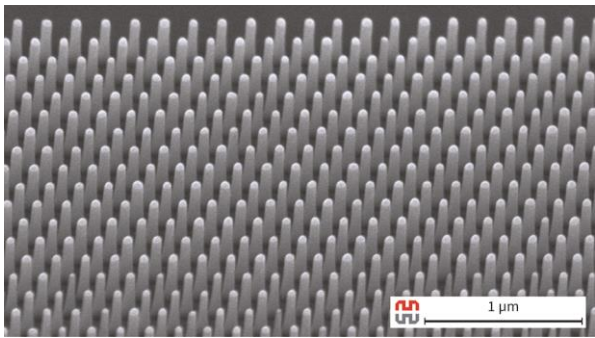
<https://heidelberg-instruments.com/>

Sonja Pfeuffer, Head of Marketing and Communications

[press@heidelberg-instruments.com](mailto:press@heidelberg-instruments.com)

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## Selected NanoFrazor Application Images with Captions

	<p>The new NanoFrazor is a cutting-edge, modular nanolithography tool designed for versatility, offering multiple configurations to meet diverse research requirements. It ranges from a compact, table-top solution that fits easily in any lab, to a robust stand-alone unit engineered to shield the system from external disturbances like acoustic noise and vibrations. For specialized needs, it can also be integrated into a glovebox, enabling nanofabrication in an inert atmosphere.</p> <p>Source: Heidelberg Instruments Mikrotechnik GmbH</p>
	<p>Array of 10 thermal cantilevers, as seen through the integrated optical inspection in the NanoFrazor software.</p> <p>Source: Heidelberg Instruments Mikrotechnik GmbH</p>
	<p>Nanopillar arrays, commonly used in metasurfaces and nano-biotechnology, can be fabricated over large areas at resolutions &lt; 50 nm.</p> <p>Source: Heidelberg Instruments Mikrotechnik GmbH</p>