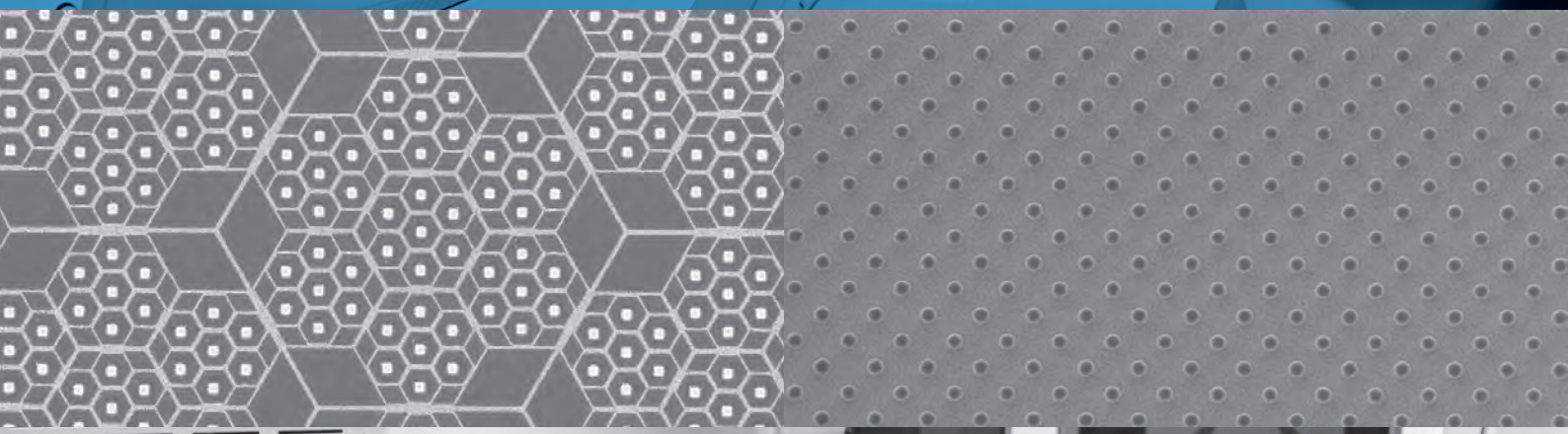
neomicra
digital nanofabrication

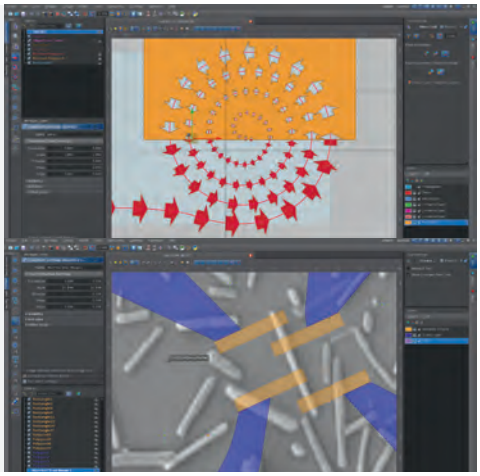
E-beam lithography with smile2, sniper2 & etp2

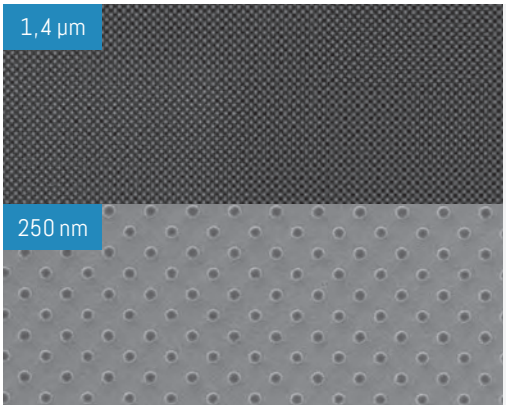


SMILE

USER-FRIENDLY AND RELIABLE SOFTWARE

Our software, smile2, incorporates state-of-the-art technologies and meets the highest requirements. Thanks to intuitive user concepts, beginners as well as advanced users are able to use the software very efficiently and achieve the best results. Innovative tools allow the easy and fast construction, administration and editing of structures, regardless of their complexity. The integrated Python interpreter can be used to automate the exposure process or to edit and create structures based on customized scripts. Data such as alignment matrices, the construction history or recorded scans are saved within structure files and can be easily reused and exchanged between different computers and documents.



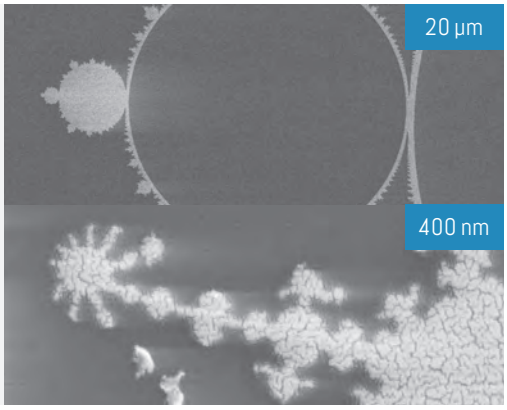


HIGH RESOLUTION PROXIMITY EFFECT CORRECTION

Thanks to the etp2 technology, it is now possible to individually address the dwell time of all potentially 4.3 billion sampling points. Based on this, our built-in and easy-to-use proximity effect correction can properly correct the dwell time at each sampling point. Therefore, our system can reach an outstanding degree of precision, down to the nanometer scale, which has previously only been possible with costly 100 kV systems.

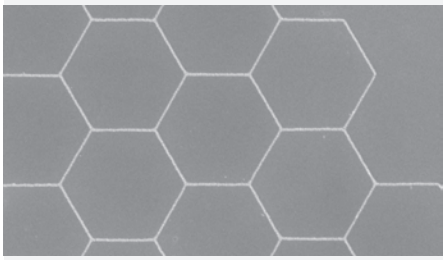
STRUCTURES WITHOUT LIMITS

No matter how creative and complex your ideas are, anything can be realized with the help of smile2. Using smile2 not only allows the exposure of many millions of polygons within a few seconds, but also the realization of procedurally complex structures, such as fractals, at maximum resolution.



KEY FEATURES

PATTERN GENERATION

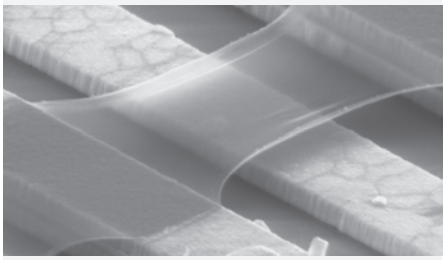


smile2 has no dedicated pattern generation hardware. All points and data required to control the beam(s) are generated by an efficient software module. An advantage of this system is that the generation of the pattern does not depend on the complexity of the structure, so that structures of any complexity can be exposed quickly and reliably. Also, users can influence the pattern generation and realize their own strategies to determine how the geometry should be exposed.

STRUCTURE CREATION

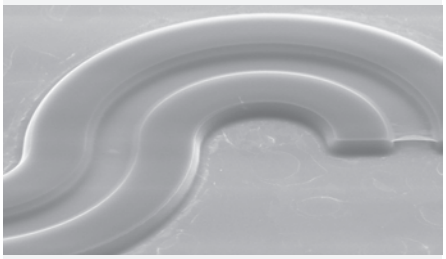
smile2 can be used efficiently by beginners and experienced users alike. It offers a huge variety of tools and utilities that allow the creation of complex structures in an easy and sophisticated way. With the help of a relational dependency system, all elements and structural attributes can be related to each other, and adjusted retrospectively. The hierarchical object structure is based on a directed acyclic graph and offers 6 degrees of freedom as well as the possibility to most flexible utilize references. Based on a robust polygon framework, smile2 offers powerful tools such as Boolean operations and B-spline curves. One further option is the use of Python scripts to automate the creation of structures and to automate the exposure process.

ALIGNMENT



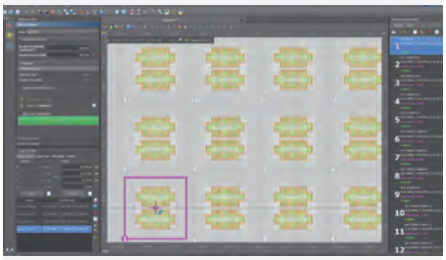
The exact alignment of individual layers is crucial for the realization of many high-precision structures. Beside semi-automatic and fully automatic alignment modes based on shape recognition, smile2 offers a very flexible, interactive and user-friendly procedure to perform alignment.
smile2 not only allows the scanning of rectangular areas, but all possible shapes. This makes the finding of markers easier, while simultaneously protecting critical regions. Furthermore, any alignment related data can be saved, transferred and reused later.

ETP2



etp2 is a new technology that allows the real-time modification of the dwell time at each sampling point without an overall delay. Combined with the flexible pattern generation, smile2 is not only able to expose binary patterns, but can effectively expose a variety of profiles at maximum resolution.

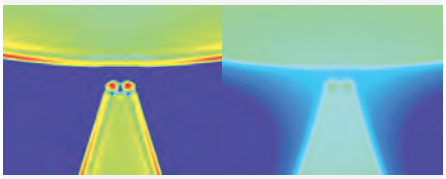
EXPOSURE



smile2 has a wafer mode in which task lists can be created and edited interactively. During the exposure of multiple structures, smile2 can perform many additional tasks required, such as exchanging structure elements as well as modifying parameters on the fly or perform a fully automatic alignment. Other key functions of the smile2 exposure system are:

- Stitching.
- Sorting of structural elements based on different criteria.
- Interactive WYSIWYG wafer mode that facilitates the task of finding structures on a wafer.
- Simulating the complete exposure process on your desktop including an option to log a variety of diagnostics data.

PROXIMITY EFFECT CORRECTION



smile2 offers fully integrated proximity effect correction (pec) based on a double Gauss model and two evaluation methods. One is a traditional method also used by other applications. The second one is a novel "deconvolution" method, which can simultaneously correct for shape and dwell time. Rather than employing geometry segmentation in order to expose dose-corrected structures, smile2 uses the etp2 technology to locally modify the dwell time at each individual raster point. This results in significant improvements and an increased reliability – especially for very small structure elements.

TEST OUR SYSTEM NOW

For a limited time, we offer free trial systems, without obligation to buy.

Within this evaluation period, we look forward to closely collaborating with you. We want to learn about and understand your requirements in order to provide you with the tools you need.

After your extensive evaluation, you decide if you wish to acquire the system or not.

System Specifications:

- 64 Bit Intel CPU, Windows 10 or Linux, 21" monitor, 1TB HDD, 16 GB RAM
- Sniper2 IO System (integrated):
  - 16 Bit resolution (optional 2 xy-channels for dual-beam)
  - Sampling rates up to 100 MS/s
  - Per sample adjustable sampling rate in real time (etp2)
  - Two digital beam-blanker control outputs
  - Two digital inputs (to use as a trigger)
  - SEM I/O-interface
- SEM control module via Ethernet, USB or serial port
- compact form factor

ARE YOU INTERESTED?

Do not hesitate to get in touch with any of your questions. We will evaluate your needs and consult you based on your individual requirements.

ARE YOU SATISFIED?

We offer significant discounts to our early adopters and trial partners who assist us in making our products better. The customer-focused team here at neomicra will continue to support you and to provide you with the updates and the tools you need.

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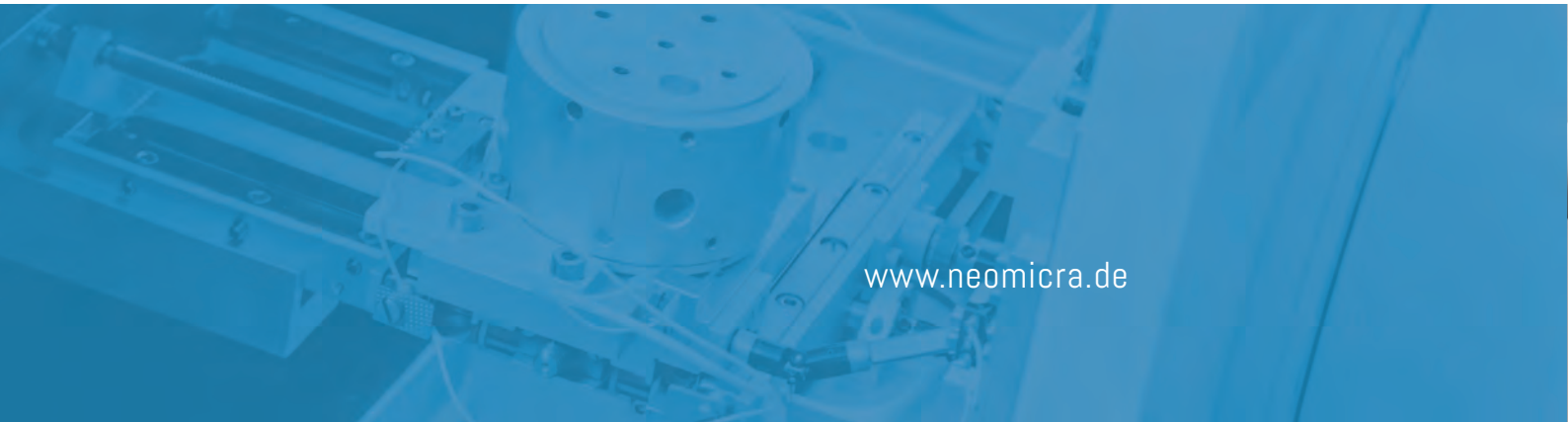

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