



NanoFrazor Lithography for advanced 2D&3D nanodevices

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At the Melbourne Centre for Nanofabrication Boardroom
151 Wellington Road, Clayton, 3168
Microsoft Teams meeting: [click here](#)
Meeting ID: 467 205 612 423 and passcode: brurbf



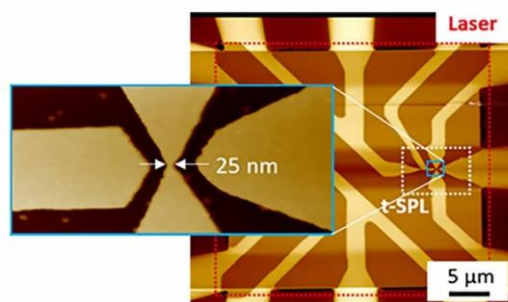
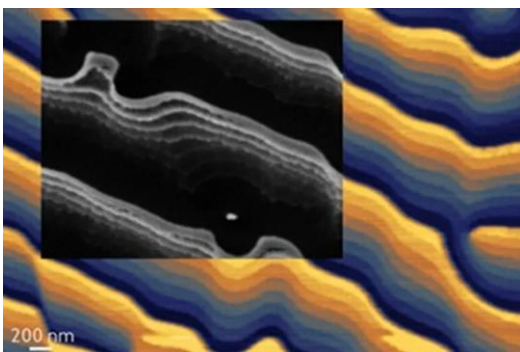
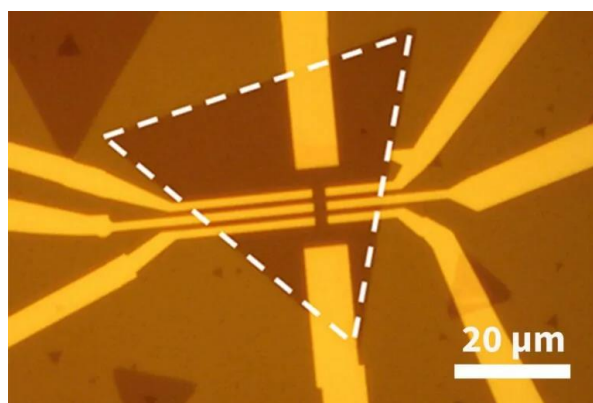
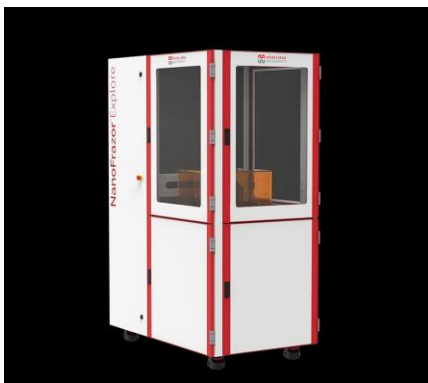
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Abstract:

NanoFrazor lithography systems were developed as a first true alternative or extension to standard mask-less nanolithography methods like electron beam lithography (EBL). In contrast to EBL they are based on thermal scanning probe lithography (t-SPL). Here a heatable ultra-sharp probe tip with an apex of a few nm is used for patterning and simultaneously inspecting complex nanostructures. The patterning depth of each individual pixel can be controlled with better than 1 nm precision using an integrated in-situ metrology method. Furthermore, the inherent imaging capability of the NanoFrazor technology allows for markerless overlay, which has been achieved with sub-5 nm accuracy as well as it supports stitching layout sections together with < 20 nm error. Pattern transfer from such resist features below 10 nm resolution were demonstrated. The technology has proven its value as an enabler of new kinds of ultra-high resolution nanodevices as well as for improving the performance of existing device concepts. The application range for this new nanolithography technique is very broad spanning from ultra-high resolution 2D and 3D patterning to chemical and physical modification of matter at the nanoscale. While patterning at below 10 nm resolution is achieved, an integrated laser write head for direct laser sublimation (DLS) of the thermal resist has been introduced for significantly faster patterning of micrometer to millimeter-scale features. The areas patterned by the tip and the laser are seamlessly stitched together and both processes work on the very same resist material enabling a true mix-and-match process with no developing or any other processing steps in between. The presentation will include examples for (i) high-quality metal contacting of 2D materials, (ii) tuning photonic molecules, (iii) generating nanofluidic devices, (iv) generating spintronic circuits and (V) optical Fourier surfaces.



Speaker Biography:

ZhengMing Wu was an application and sales engineer for several years at the Aerial Ministry Research Institute\ before she received a MSc in physics at the University of Basel. During her PhD in Basel, she fabricated nano devices using UV and e-beam lithography in the group of Prof Schönenberger. Afterwards she joined two startup companies which manufacture the high-tech equipment used in nano-technology research. She successfully set up and developed the sales network worldwide. Zhengming can be found at numerous international conferences, seminars and workshops where she explains the NanoFrazor technology and discusses about applications.

Nano Vacuum Pty Ltd.:

Nano Vacuum's team has over 50 years of experience within the nanofabrication industry. We have highly qualified staff members including PhD qualified Mechanical and Electrical Engineers with expertise in Bio-Nano and Surface Science Engineering. Our aim is to provide the best service and advice to our Australian and New Zealand customers, equipping you with cutting-edge tools for your research. Our range of deposition, etching, plasma modification, clean/inert environments, packaging and lithography and surface characterisation tools offer nanofabrication resources to ensure you stay at the forefront of the highly competitive research space. Nano Vacuum can also design, project manage and deliver complete clean rooms including UHP gas panels and orbital welded piping, clean room walls, HEPA filters, toxic gas cabinets, wet/dry scrubbers and more. All this will be with a service level and price point that will exceed your expectations.