

**Direct fabrication of sub-20 nm nanopores using focused ion beam, and further closure with electron beams.**

**Saulius Juodkazis, Adrien Mau and Clémence Briosne-Frejaville**Centre for Micro-Photonics, Swinburne University, Australia.

**ABSTRACT**

Nanopores are nanometer-sized holes often fabricated in solid-state membrane. They can be used to detect specific molecules, with high efficiency when their size is close to the molecule’s size.  
We report the direct fabrication of 15nm-wide pores in ultrathin silicon nitride membrane using focused ion beam etching with a very small aperture. Using scanning electron microscopy, we then further reduced the pores to sub-8nm holes within minutes.