

## Micro and nanostructuring mechanical and optical devices by focused ion beam

*Xichun Luo*

*Centre for Precision Manufacturing, University of Strathclyde*

### **Abstract**

This talk highlights the research and development of focused ion beam (FIB) micro and nano structuring techniques carried out at the Centre for Precision Manufacturing. It presents a deterministic FIB fabrication approach with an effort to compensate the divergence errors associated with the FIB processing technique, such as beam overlap, angular dependence of the sputter yield and a level set approach to predict generated surface topography in consideration of the ion re-deposition effects. Theoretical and experimental studies on ion induced damage in nanodevices are also introduced by using molecular dynamics simulation and transmission electron microscope. It also presents a novel micro and nanostructuring approach based on FIB induced bending mechanism which is a very promising technique to create free standing micro/nano structure of desired shape for the next generation micro/nano devices. The talk concludes with several case studies including FIB microstructuring micromilling cutter for prolonging tool life, FIB polishing optical fibre interferometer and FIB nanostructuring single crystal diamond tools for scale up manufacturing of nanogratings.

[ultraprecision.org](http://ultraprecision.org)