

## **Plasmonics meets the ultimate ruler with Xrays**

Joint project between University of Cambridge NanoPhotonics Centre and the UK National Physical Laboratories

Development of plasmonic based sensors and verification of performance using x-ray interferometry

The metrology community worldwide has identified an urgent requirement for novel displacement sensors with sub nm accuracy to meet the growing dimensional metrological requirements of nanotechnology. Plasmonic sensors, based on optical spectroscopic signatures made from sub-nm gaps between noble metal nanoparticles due to quantum tunnelling and extreme light confinement, have picometre sensitivity to the gap size, thereby offering the potential as displacement sensors. The objective is to exploit this plasmonic phenomena to develop displacement sensors for real world applications. The performance of the sensors will be verified using x-ray interferometry to link them to the SI length scale. Target specification of the sensors will be an accuracy of 0.05 nm over sub a sub nm range.

UK students are preferred.

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