PhD Projects 2016 – Subwavelength Plasmon mode Lasers.

Miniaturization in lasers has in recent years taken a leap forward by employing metal structures to confine light in resonators with dimensions smaller than that of the emitted light itself. Challenges still remain though to make these lasers a useful alternative compared to much larger devices based on dielectric resonators. In the electrical, electronic and computer engineering school cleanroom we are making lasers which will exploit a new highly efficient metal-insulator-metal waveguide structure.

PhD projects associated with this work could involve the following: 1) Measurement and modelling of fabricated devices to understand the ultimate switching speeds possible with subwavelength plasmon mode lasers. 2) Modelling and simulation of laser cavities based on fabricated waveguides, but adding patterning to form photonic crystal like structures based on plasmons. Furthermore fabricating these structures using focus ion beam milling, performing measurements to see how they conform to theory, and discovering the possible limits in speed and low power possible with small plasmon mode lasers.

Useful background reading on the subject would be:


