



All-Optical Wavelength Conversion on a Microchip

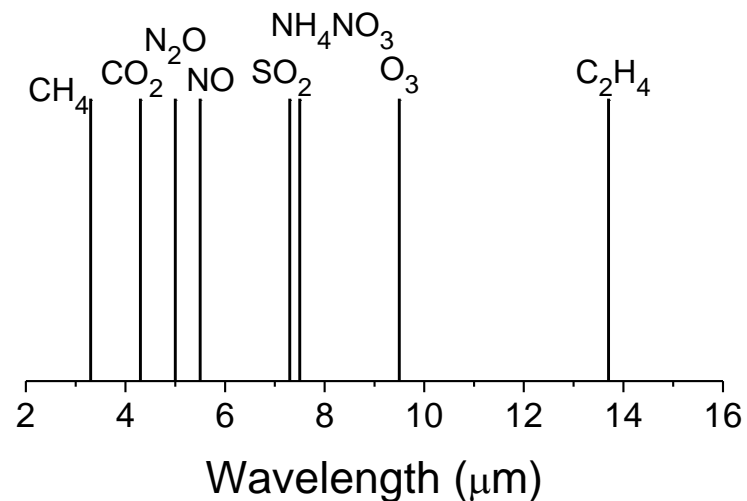
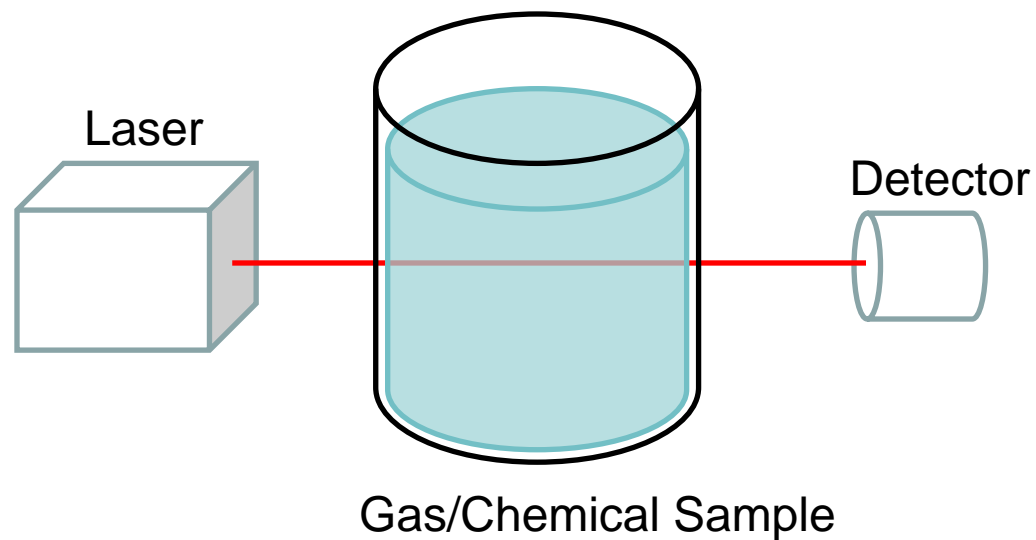
Sean J. Wagner
Photonics Group



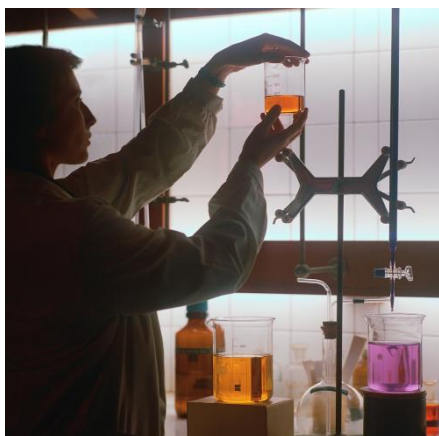
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TORONTO



Motivation



Chemical Analysis



Security



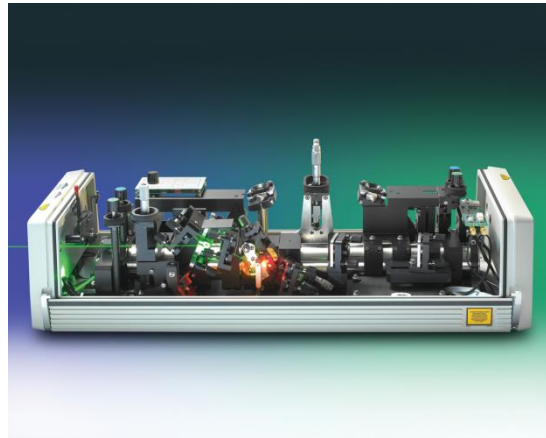
Environmental Monitoring



Ultrafast Laser System



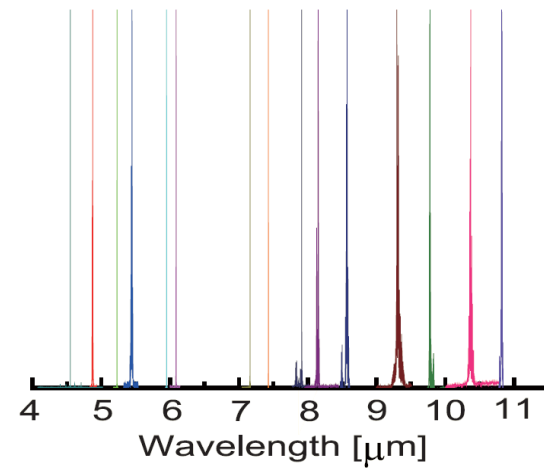
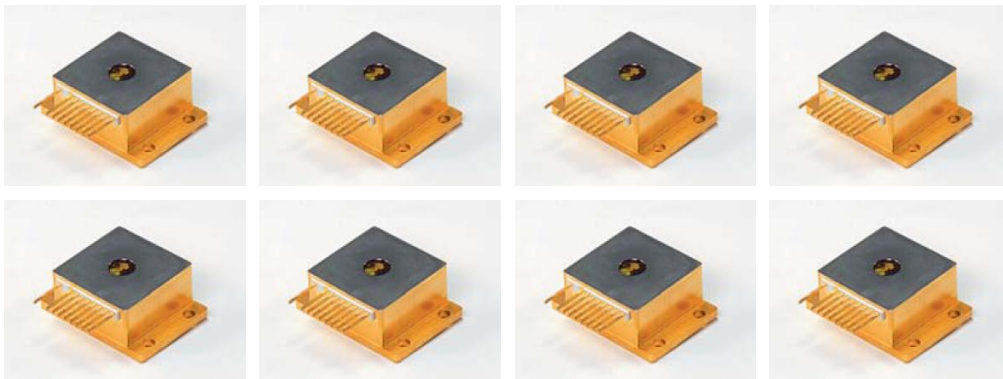
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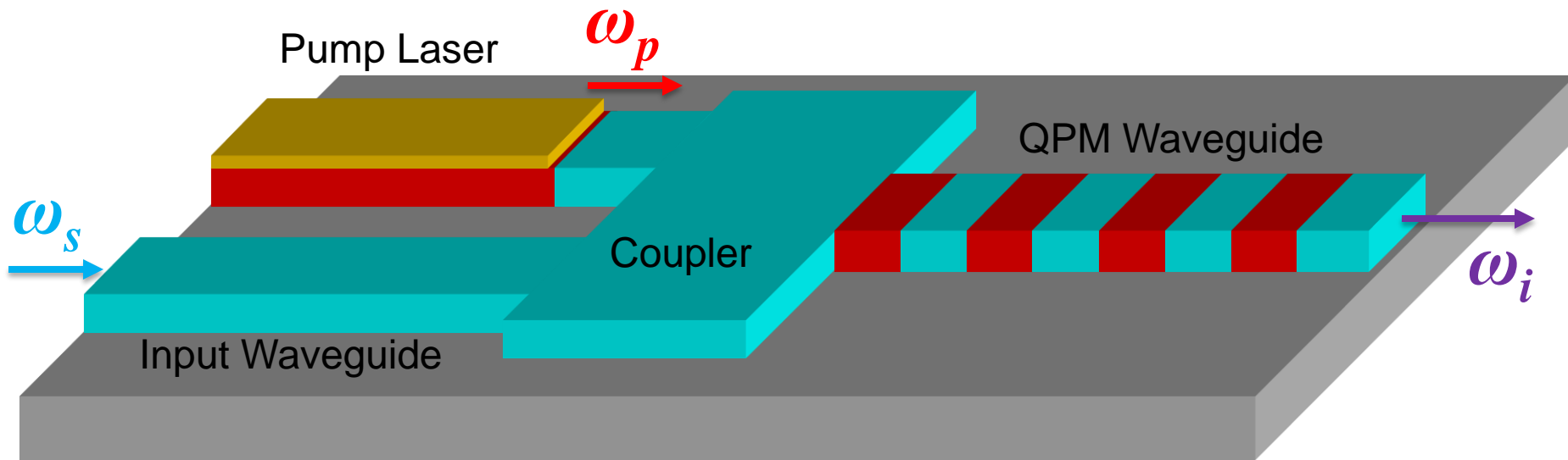
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Quantum Cascade Lasers



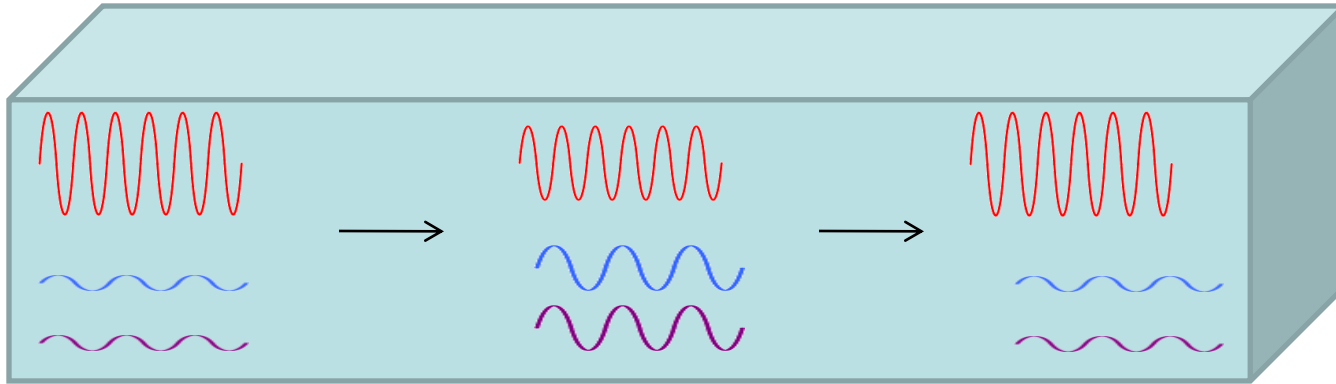
Single-Chip Converter



$$\omega_i = \omega_p - \omega_s$$

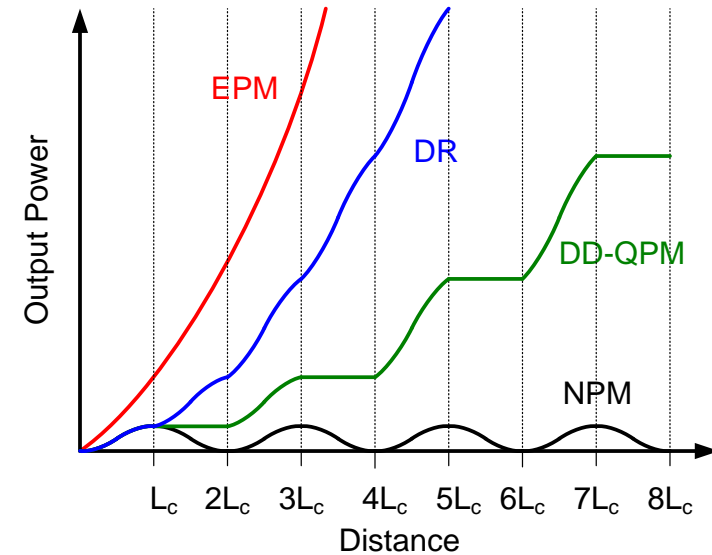
Phase Matching

Wave Mixing in Nonlinear Medium

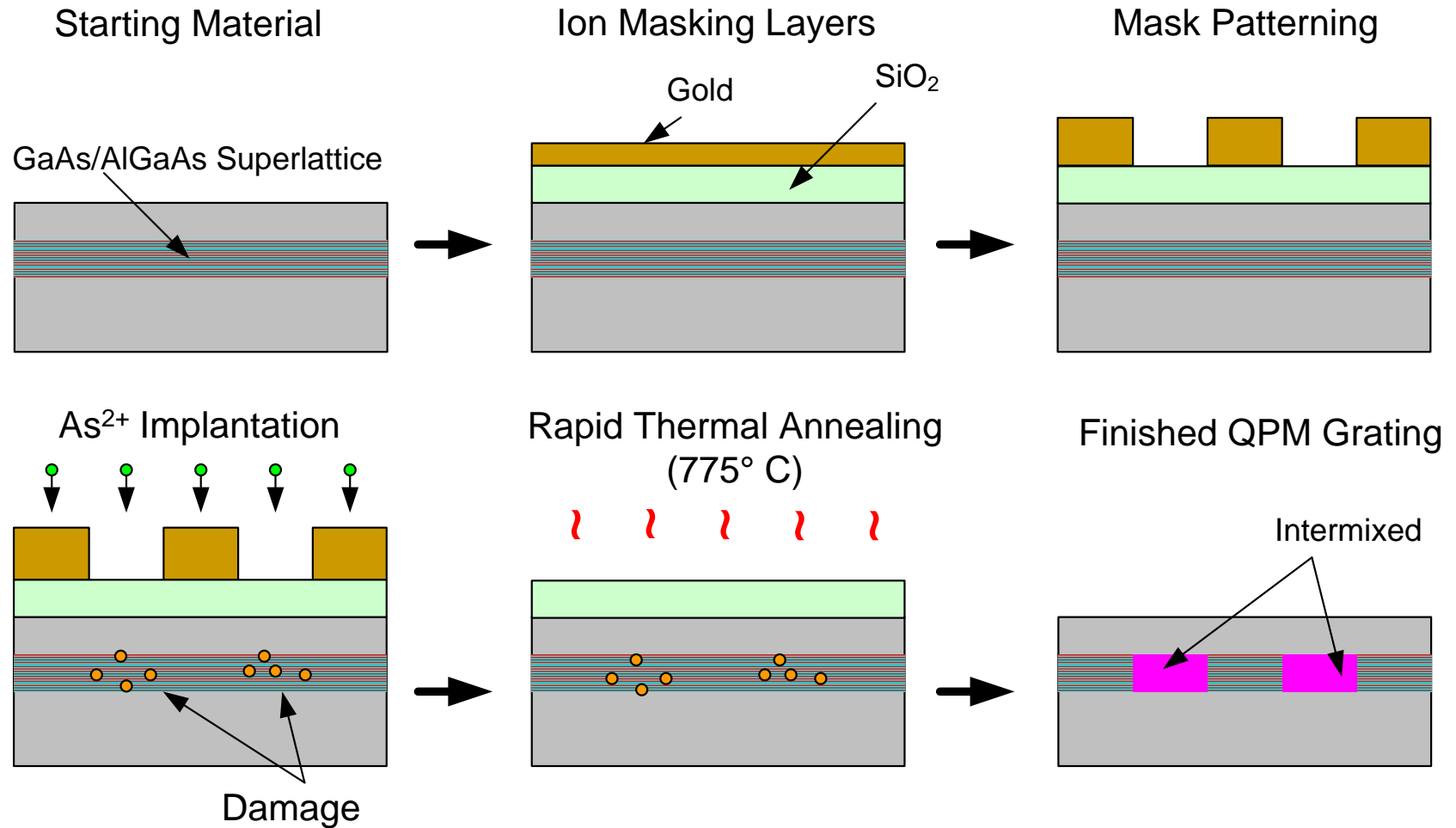


$$\omega_2 = \omega_3 - \omega_1$$

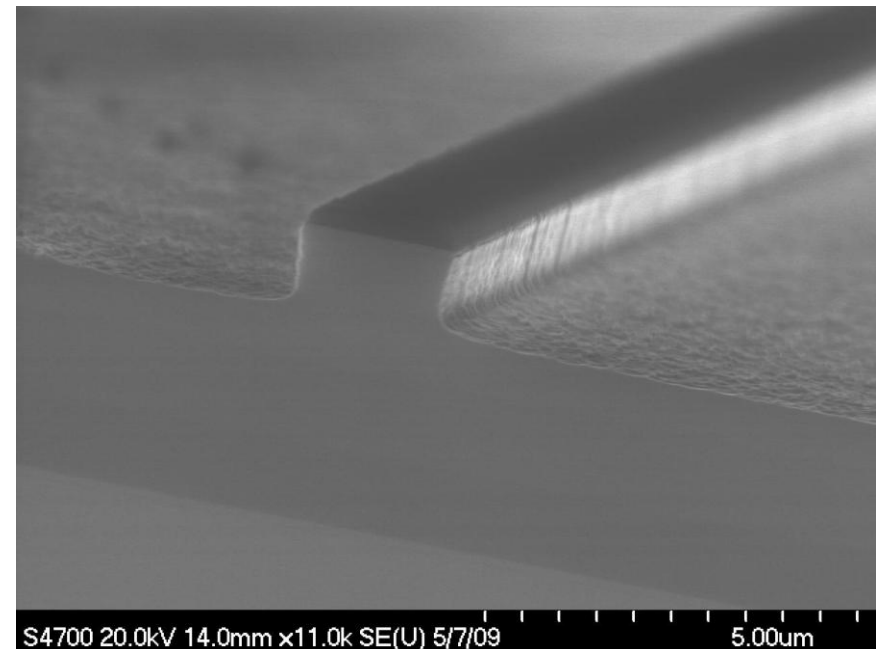
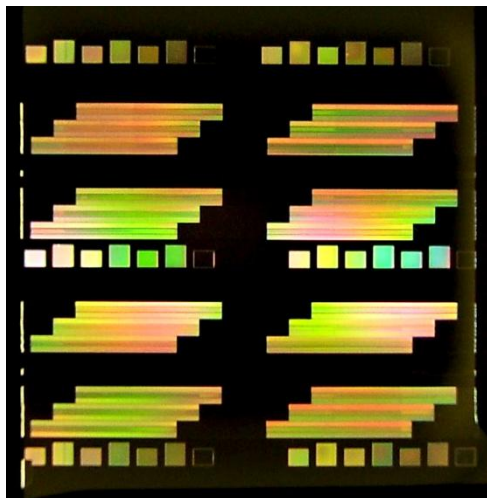
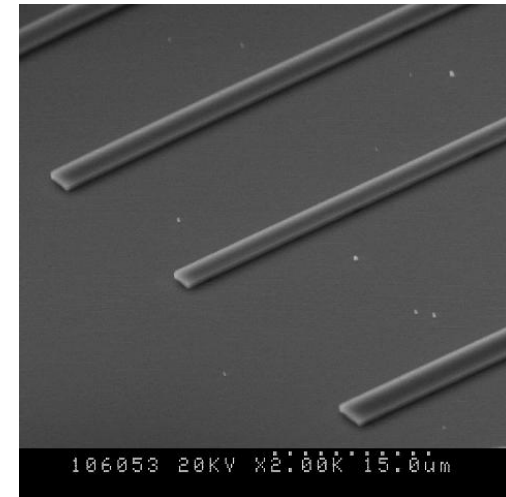
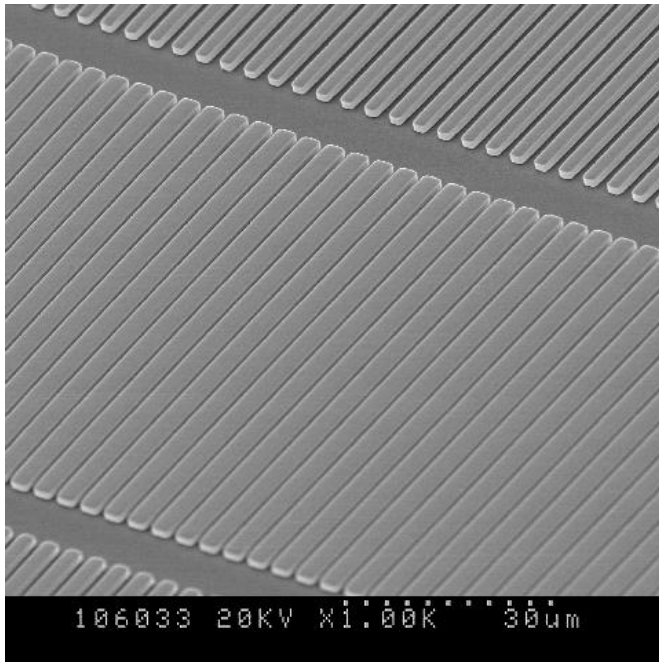
Solution: Quasi-Phase Matching



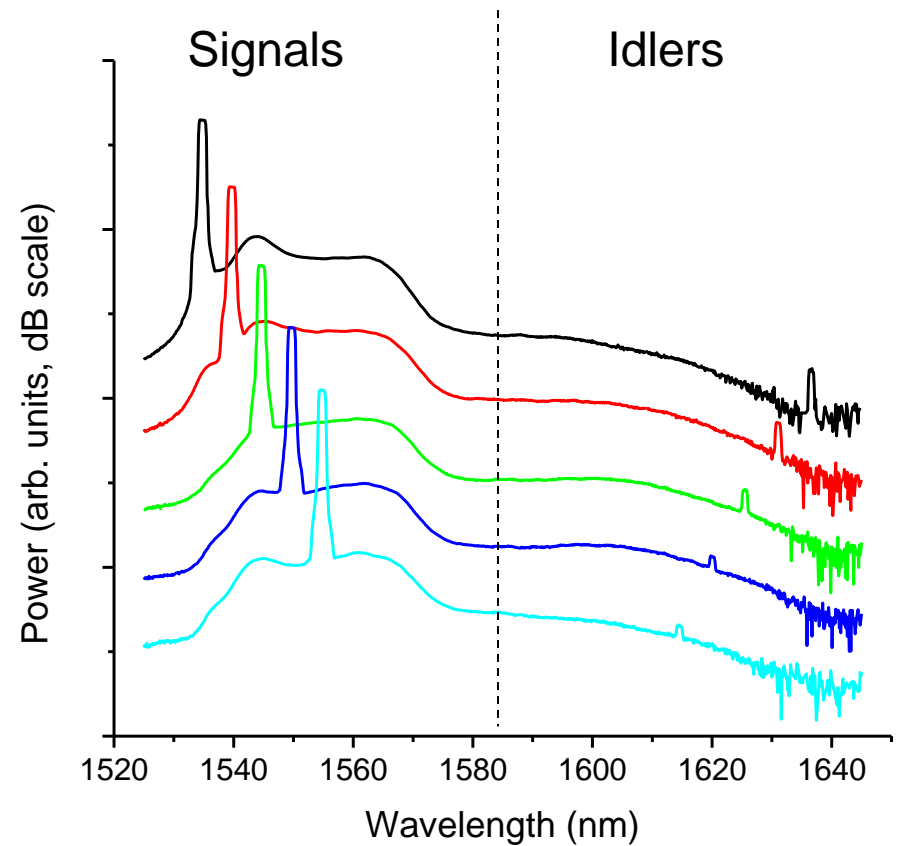
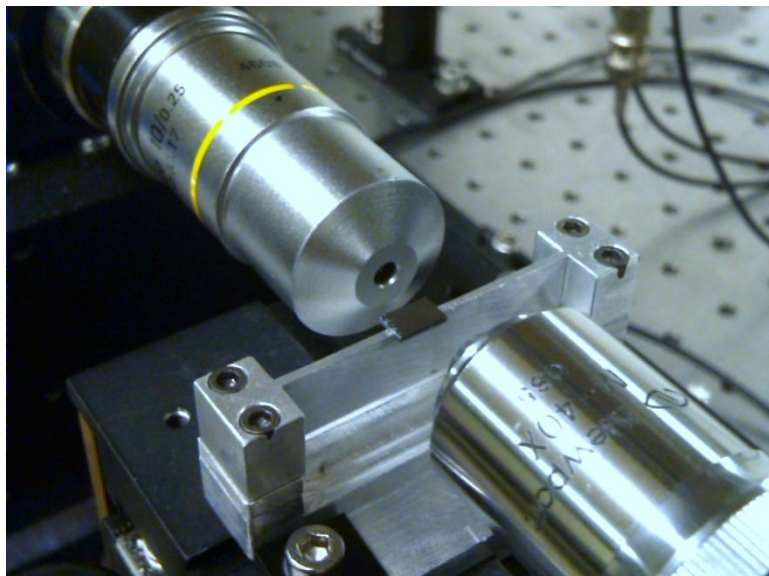
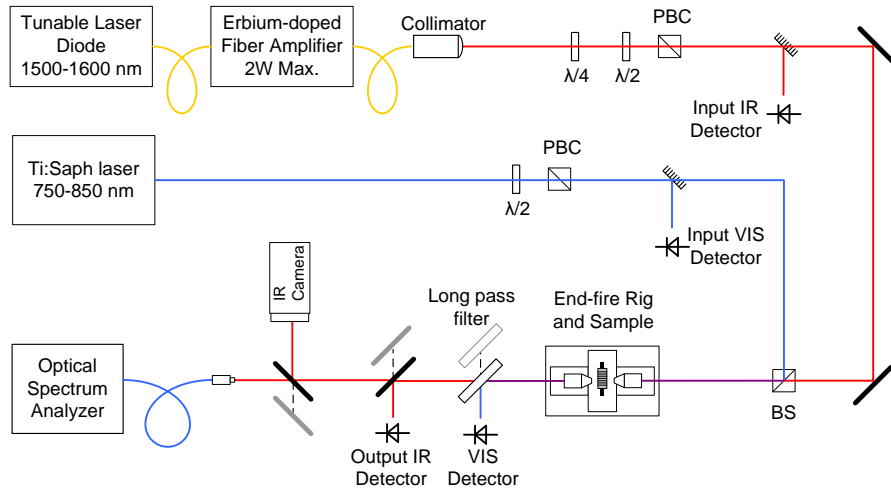
Fabrication Process



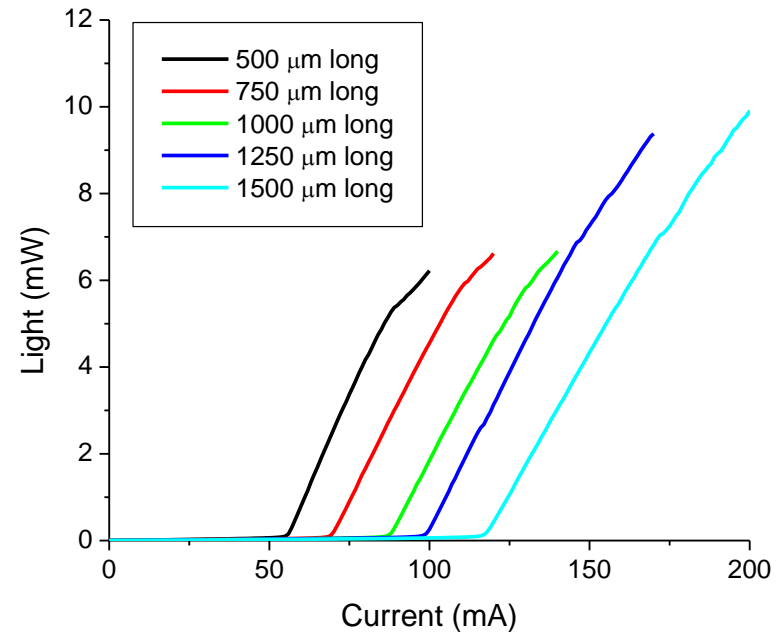
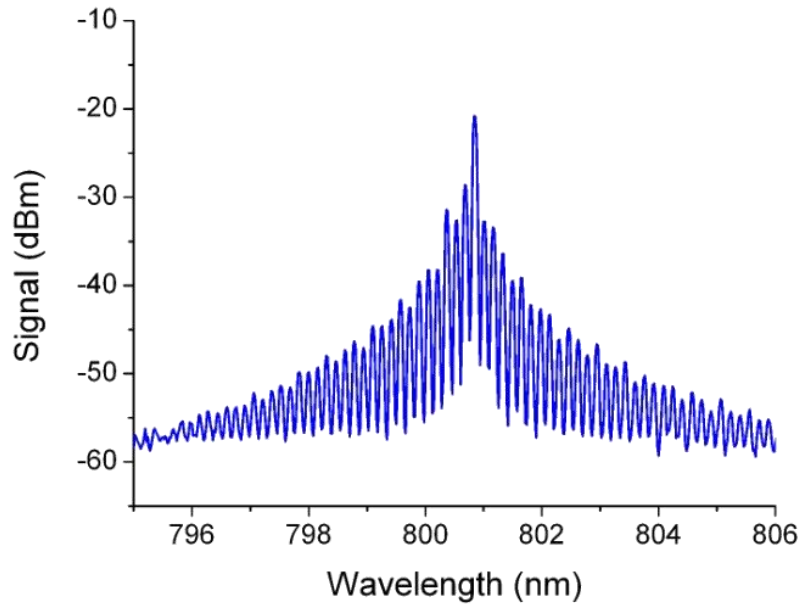
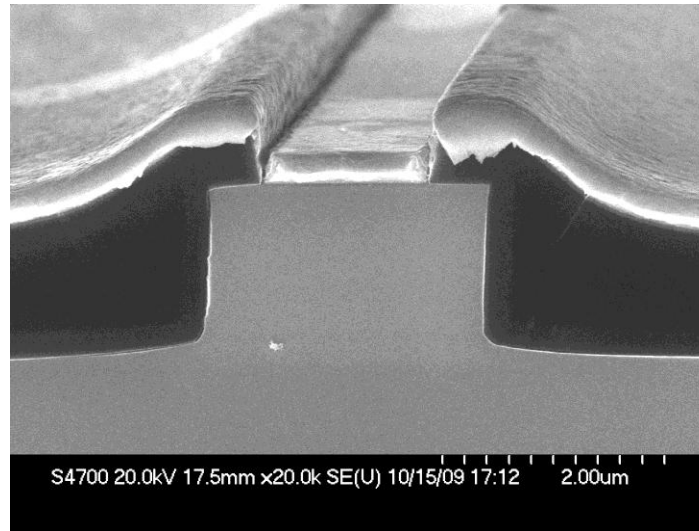
Fabricated Waveguides



Conversion Experiment



Superlattice Laser





Acknowledgements



University of Glasgow

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Institut de Ciències Fotòniques



EPSRC



Ontario Centres of Excellence
Where Next Happens





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