The CORNERSTONE Project:
UK Silicon Photonics Fabrication Capability

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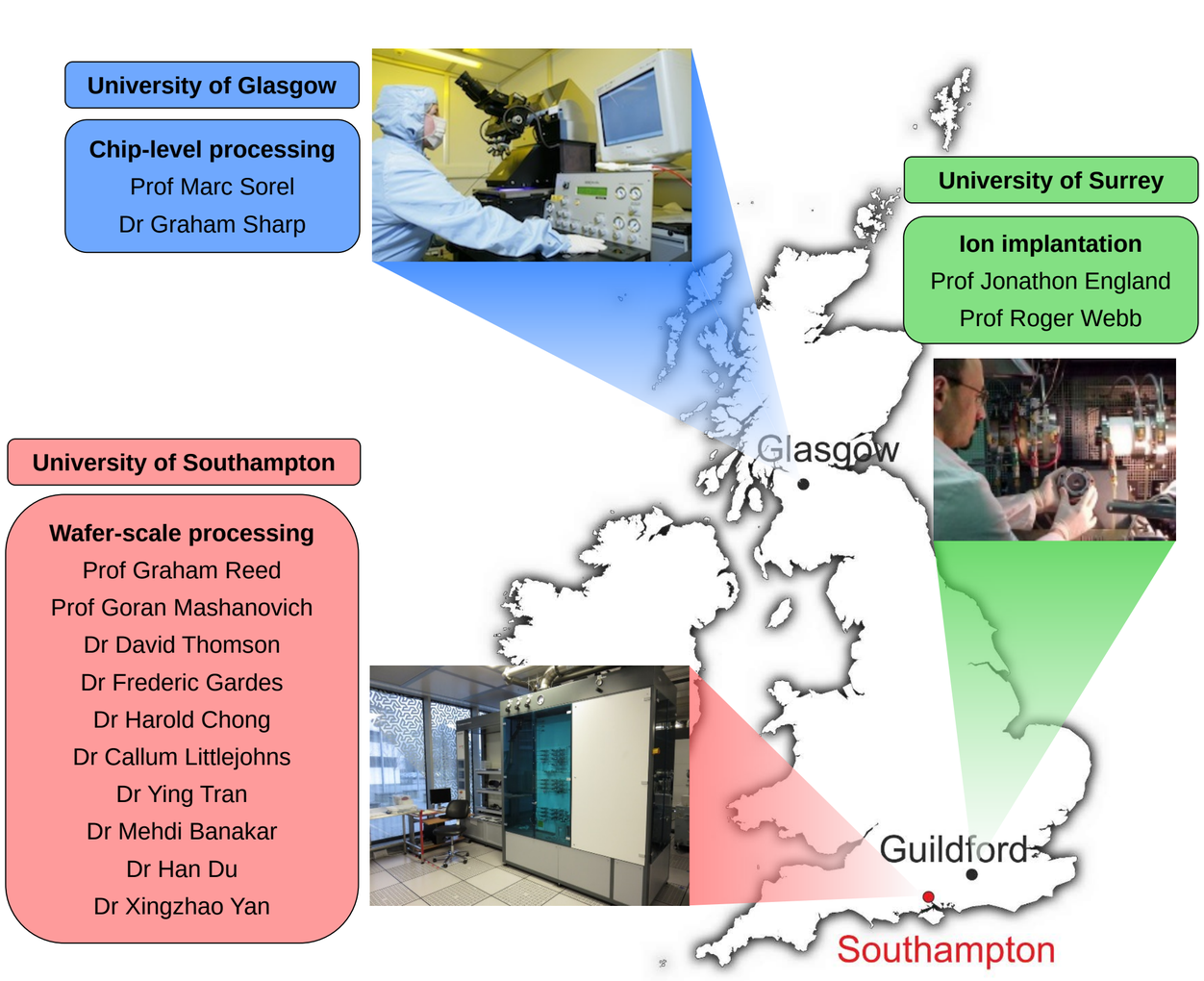
CORNERSTONE- CAPABILITY FOR OPTOELECTRONICS, METAMATERIALS, NANOTECHNOLOGY, AND SENSING

How to show your research has potential for a wider social/economic impact? ⇨ Fabricate devices in an INDUSTRIALLY COMPATIBLE way (DUV photolithography)

Overview: CORNERSTONE is a new rapid prototyping fabrication capability that can provide competitive prices for both active and passive silicon photonic devices, via an MPW service.

Aim: To establish silicon photonics fabrication capability that can support photonics research in the UK, and beyond.



What is Offered?

- Three standard SOI photonic platforms:
  - *220 nm Si / 2 µm BOX, 340 nm Si / 2 µm BOX, and 500 nm Si / 3 µm BOX*
- Passive devices fabrication runs:
  - *waveguides, MUX, DEMUX, filters,…*
- Active devices fabrication runs:
  - *modulators,…*
- Three Si etch depths for each SOI photonic platform:
  - *shallow Si etch step (for grating couplers)*
  - *intermediate Si etch step (for rib waveguides)*
  - *full Si etch, to the BOX layer (for strip waveguides)*
- Four implantation steps for active runs (2 each for *n*-type, and *p*-type):
  - *low and high doping levels for both n-type (phosphorus) and p-type (boron) implantation steps*
- Three metal layers in the BEOL:
  - One layer for ohmic Si contacts
  - Two layers for heaters

CORNERSTONE Facilities

- DUV Nikon NSR-S204B scanner
- E-beam lithography
- Nanoimprint lithography
- Contact lithography (i-line)
- Wet & dry etch systems
- Furnaces and RTA systems
- PECVD, LPCVD & ALD systems
- Evaporation & RI sputtering systems
- CMP, wafer dicing,...
- Bonding: wafer, wire, flip-chip
- FIB, SEM, ellipsometry,...
- Ion implantation

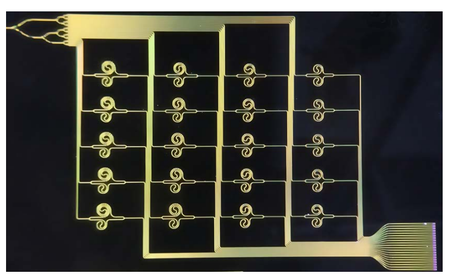
Schedule & Cost

Call	Call Type	Feb. 2019	Mar. 2019	Apr. 2019	May. 2019	Jun. 2019	Jul. 2019	Aug. 2019	Sep. 2019	Oct. 2019	Nov. 2019	Dec. 2019	Jan. 2020	Feb. 2020
MPW #12 – 340 nm SOI platform	Passive													
MPW #13 – 220 nm SOI platform	Passive													
MPW #14 – 500 nm SOI platform	Passive													
MPW #15 – 220 nm SOI platform	Passive				Call announced								Submission deadline	
MPW #16 – 340 nm SOI platform	Passive													
MPW #17 – 220 nm SOI platform	Active													
MPW #18 – 220 nm SOI platform	Passive													

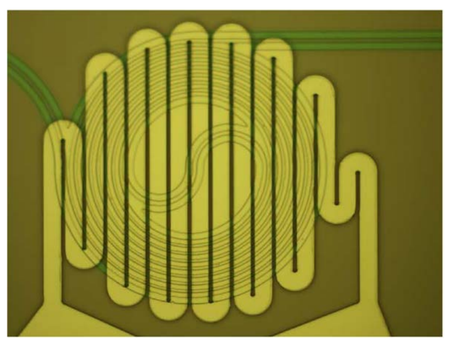
Design area	Active devices	Passives with heaters	Passive devices
11.47 mm x 4.9 mm	£35,000	£10,000	£5,000
5.5 mm x 4.9 mm	£20,000	£7,000	£3,500

Example Capabilities

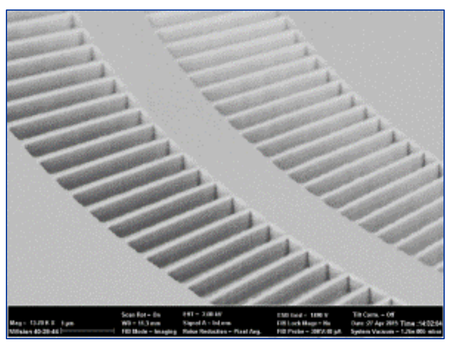
Spectrometers



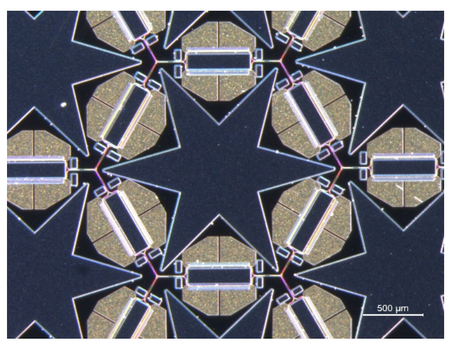
Passives with heaters



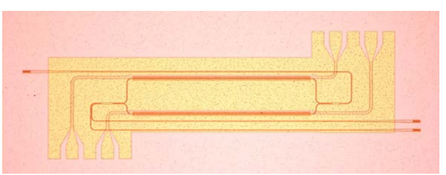
Suspended waveguides



Tuneable processor cores



Modulators



Vision: To underpin photonics research in UK and beyond, and support a wide range of research activities