

# Enabling innovation using the CORNERSTONE Silicon Photonics Foundry

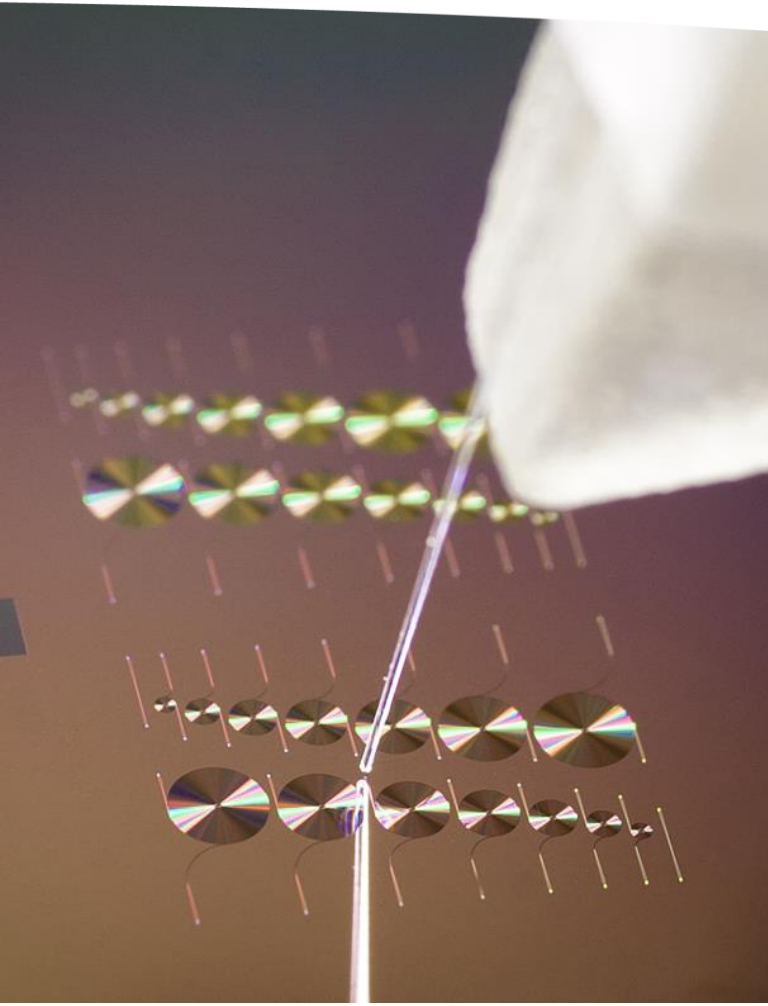
Prof Callum Littlejohns  
University of Southampton, UK





## CORNERSTONE Photonics Innovation Centre (C-PIC) vision

To take silicon photonics technologies from research labs to everyday life by enabling ubiquitous silicon photonics solutions



# CORNERSTONE foundry service

- Amongst the shortest delivery times
- Simple admin processes
- Everything is open-source & license free
- Versatility of process flows
- Hybrid deep-UV + e-beam lithography to enable seamless scaling to higher volumes

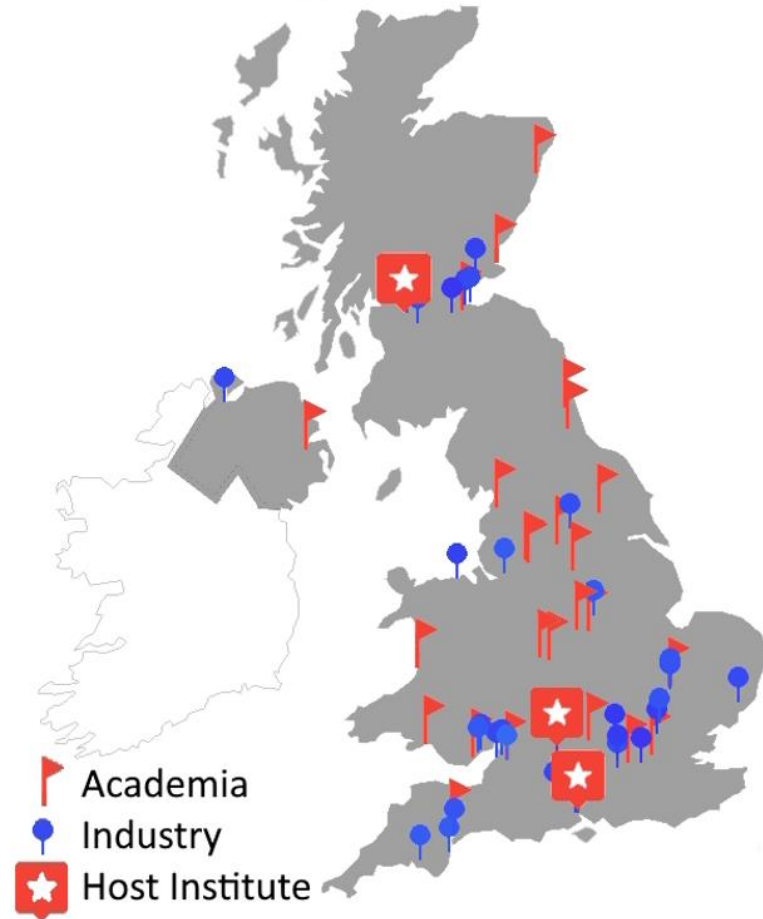
[www.cornerstone.sotonfab.co.uk](http://www.cornerstone.sotonfab.co.uk)

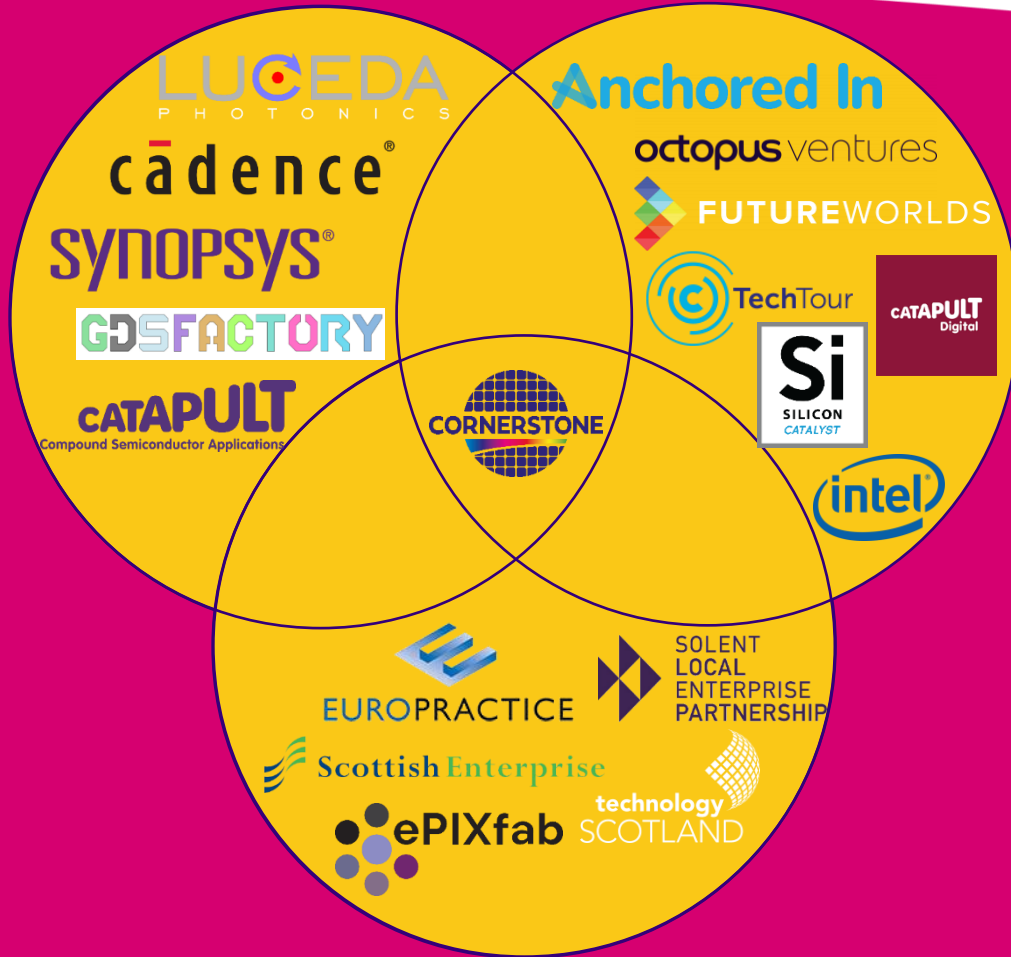


## In the C-PIC programme, we aim to be more than just a foundry

### Via:

- Start-up support
- Expansion of training – both technical & commercial
- Recognised focus on EDI with dedicated EDI lead
- Increase in networking events



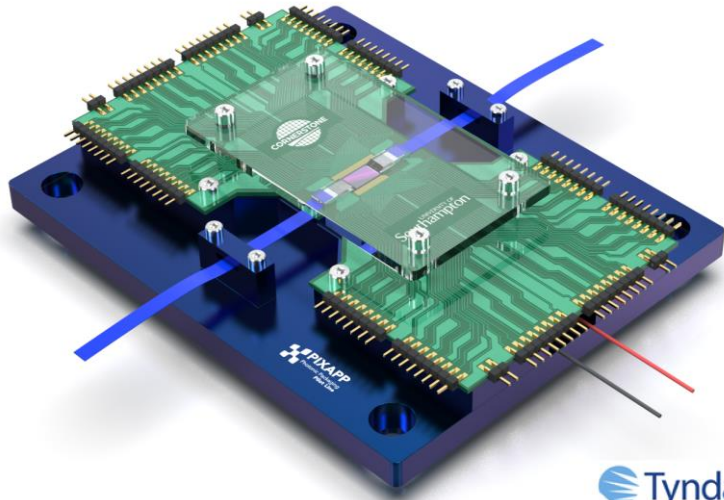


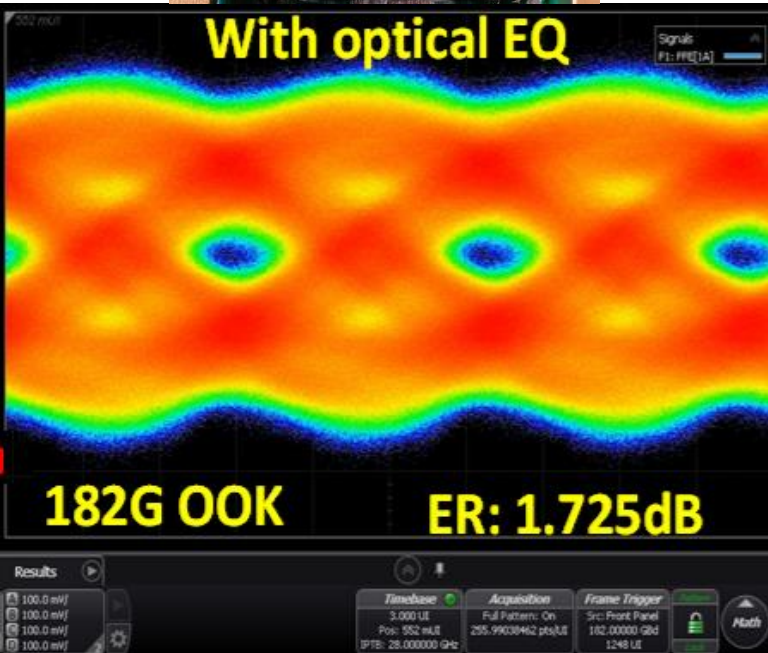
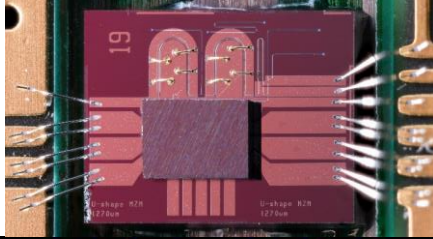
## Enabling impact

- Ecosystem for exploitation
  - Network discovery
  - Problem<>Solution
  - Tech & commercial
- World-leading research to world changing impact

## Open-source PDK

- We need your help!
- We have a mission to build a truly open-source PDK where anybody can add their own designs into the PDK
- More information later in the year





## Case study: High speed Si MZM

- **182 GBaud (OOK)**
- Integrated MZI modulator (CMOS Driver + Si modulator)
- Total electrical driver power efficiency:  $< 1$  pJ/bit
- Bit Error Rate:  $1e-3$ .
- Feed-forward equalisation adopted on Digital Communication Analyser

G. T. Reed et al. "Beyond 300Gb/s from an integrated single-channel silicon photonics modulator driver combination", IEEE Silicon Photonics Conference, Tokyo, Japan, 2024.

## Modes of access

### Multi-project wafer run

- For proof-of-concept and early-stage R&D
- Cost sharing among various users
- Uses standardised technology
- Ideally suited for researchers, startups, SMEs, etc.

### Bespoke fabrication run

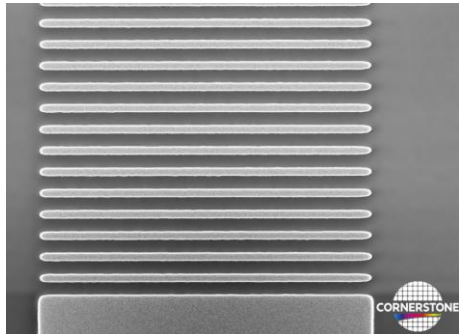
- Large design space suitable for design sweeps for optimisation
- Standardised (lower risk) or customised process flow (higher risk)
- Platform customization possible



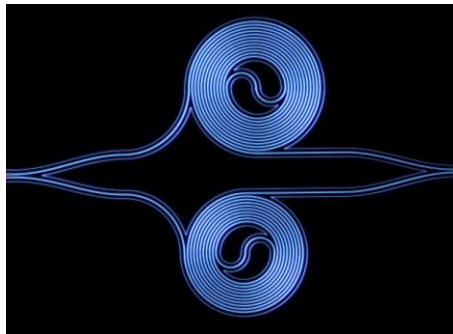
## MPW live calls...

- All free-of-charge if you're based at a UK University
- 50% discount for UK companies

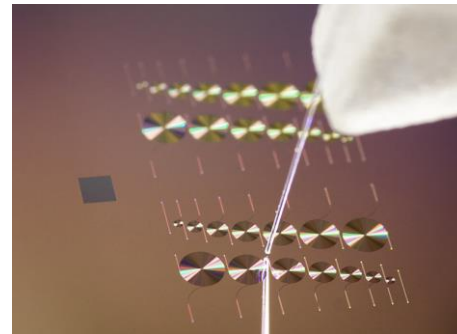
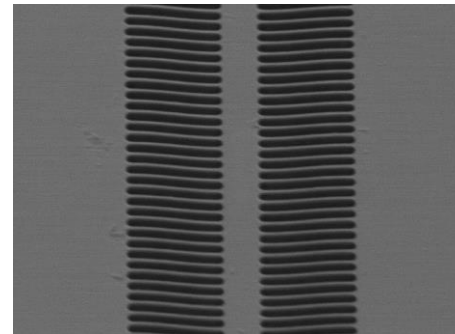
MPW #40: 340 nm SOI



Ge-on-Si MPW #5



Suspended-Si MPW #6 MPW #41: 220 nm SOI



Schedule on our website: [www.cornerstone.sotonfab.co.uk/mpw-schedule-costs](http://www.cornerstone.sotonfab.co.uk/mpw-schedule-costs)





Thanks for your attention

Any questions?



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Physical Sciences  
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