



THE UNIVERSITY
of EDINBURGH

Edinburgh Silicon R&D Interests

Philip Clark, Stephan Eisenhardt, Sinead Farrington, Silvia Gambetta, Pratik Gheewalla, Yanyan Gao, Bojan Masic, Juan Pablo Moraga, Owen Shea, Andrzej Szelc, Jon Webster, Mark Williams

Silicon Past and Present Experience

- **ATLAS ID, ITk** – mechanics/services design and fabrication, bus tape design, Common Hybrid testing, module & services QA/QC, testbeam work and analysis, ITk design: simulation / performance /occupancy studies
- **LHCb** – studies towards Mighty Tracker: characterisation in lab and test beam; flex tapes; optical readout
- Longer in the past: individuals on **CDF** silicon
- Edinburgh's nuclear physics group also working on silicon with integrated ASICs
- SiPMs for DarkSide

- New, equipped, **clean room suite** is in final stages – 10m² ISO 6 room within new 50m² ISO 7 room finished and validated (adding to existing 35m² ISO 8 room)
 - Kit: probe station for failure analysis of silicon devices at temperatures down to -60°C, a semiconductor characterisation system, a ball and wedge wire-bonder, complemented by a precision silicon placement and die attachment facility, a climate chamber and a high-powered stereo and a 3D microscope
- **Refurbished** dedicated 40m² room for construction of ATLAS ITk services renovated and ready for use by end of the year

R&D Interests

- LHCb Mighty Tracker
- ATLAS inner layer pixels for Run 5
- HVCMOS for CEPC and generic use
- See these as **opportunities** to **demonstrate** technologies for **future colliders** as well, with a mix of strategic and blue skies R&D in European tech roadmap language...
- Technical interests:
 - **small-pitch LGAD** detectors with ~ 30 ps precise timing (iLGAD, trench-isolated) - potential applications for LHCb VELO and beyond HEP (synergy with the group's parallel development of single-photon detectors with < 50 ps resolution)
 - Digitisation, modelling, simulation of sensors; cross-talk modelling, time-walk.
 - **Mechanics/services**
 - **readout**
 - **QA/QC**
 - Scottish Microelectronics Centre a partner on LGAD project and potentially further projects
 - Plan to hire 2 year **PDRA** to focus on silicon R&D

New ISO 6 clean room!

