

University of Manchester interests for Future R&D

Francisca Munoz Sanchez on behalf of the Manchester's group

Future UK Silicon Vertex & Tracker R&D Workshop

8th September 2022



The University of Manchester

R&D interests and capabilities at the University of Manchester

- **R&D in semiconductor detectors:**

- 4D-tracking Technologies: 3D and 3D trenches silicon, LGADs, 3D diamond
- Simulation/modelling
 - Before and after irradiation
- Characterisation: electric, timing (TCT/TPA) and ^{90}Sr
 - Before and after irradiation

- **R&D in Mechanics:**

- Design, assembly, prototyping, production and testing (metrology and thermal performance)

- **R&D in Cooling:**

- Design and testing (pressure and leak tests)

- **R&D in electronics:**

- Design, prototyping and testing (power lines, high speed PCB/flex designs)
- FPGA programming

Facilities, capabilities and expertise

- **Facilities at the department of Physics and Astronomy:**

- Clean room
- Temperature controlled Probe station
- Radio active source
- Wire-bonding
- Automatic capabilities for module assembly, gluing, alignment
- SmartScope
- Large volume, low temperature climate chamber
- CO2 cooling machines (MARTA and blow off)

- **Facilities at other institutes at the University of Manchester**

- TPA-laser → [Photon Science Institute](#) (PSI)
- 3D printing (Ti, stainless-steel, Al+Si+Mg) → [Henry Royce Institute](#) (HRI)
- Cooling → [Graphene Engineering Innovation Centre](#) (GEIC)
- SiPM → [National Graphene Institute](#) (NGI)
- DCB sample testing → [National Composites Certification and Evaluation Facilities](#) (NCCEF)

- **Person Power**

- Academics (10)
- Hardware researchers (4)
- Electronics engineers (2)
- Mechanics engineers (2)
- Technicians (6)
- Students (between 5-10)

- **Expertise:**

- Solid state radiation detector design and characterisation
- Mask design
- Laser processing
- Metrology
- Mechanics, electronics and cooling design, prototype, assembly and production
- Centaurus –TCAD licence and expertise
- FPGA programming
- DAQ development
- Management
- ATLAS, LHCb, superNEMO, DUNE, SBND, DarkSide, NEXT100, g-2, Mu2e, BESIII