

Welcome to QMUL

Prof. Adrian Bevan



- 5 Inner London campuses
- 3 Faculties: Science and Engineering, Medicine & Dentistry, Humanities and Social Sciences
- Long history of studying radiation effects and developing instrumentation

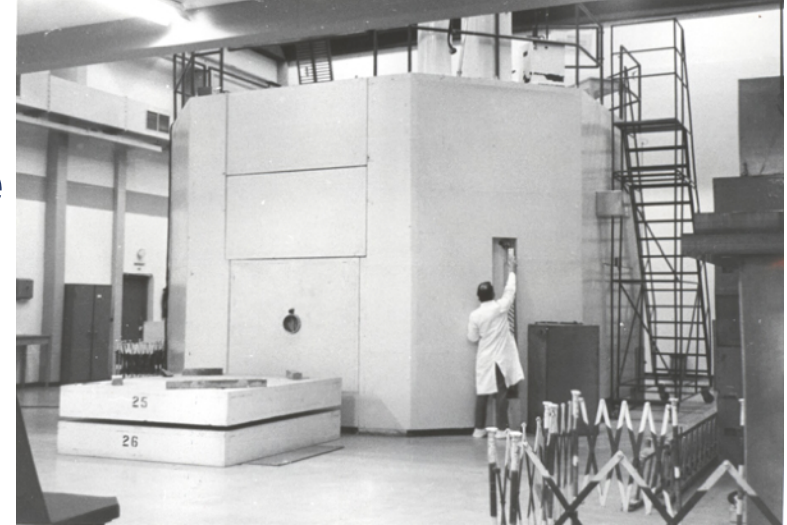
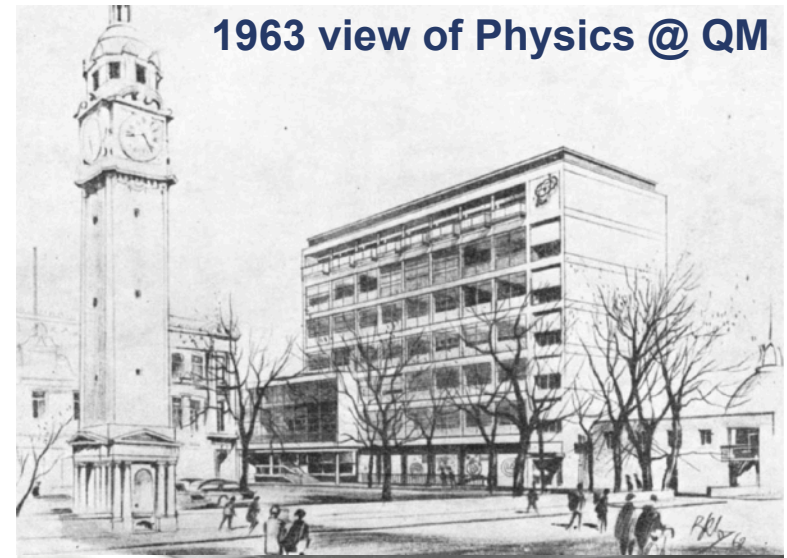
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Housekeeping

- **In case of fire, exit the building and follow locals to the assembly point in Library Square (follow locals out of the building, we will direct you to that point in the event of a fire alarm)**
- **We have a zero tolerance approach to inappropriate behaviour**
- **Participants are expected to be respect and professional of participants, staff and students**
- **Hope that you all enjoy the meeting and your visit to London and the**
- **Lunch, coffee and reception today in the lobby area on the ground floor (where you registered)**
- **We hope that you all enjoy the meeting and your visit to London**

QMUL highlights

- Origins of QM date back to 1123 (Bart's Hospital)
- 1785: UK's first medical school founded
- 1886: Mile End Campus founded and our Physics department was created
- 1909: Marsden and colleagues studied U and Th to understand the nature of α decay
- 1964: UK's first university-based nuclear reactor
- Long history of silicon detectors dating back to the OPAL vertex detector for LEP and the ATLAS SCT
- Target science through to product development
- 3 physics related Nobel Prizes: Joseph Rotblatt (Non-proliferation), Peter Mansfield (MRI) and Charles Kao (Optical Fibres)

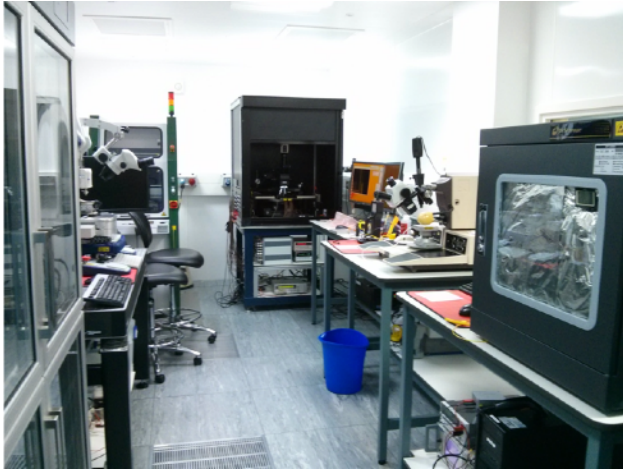


QMUL's first nuclear reactor

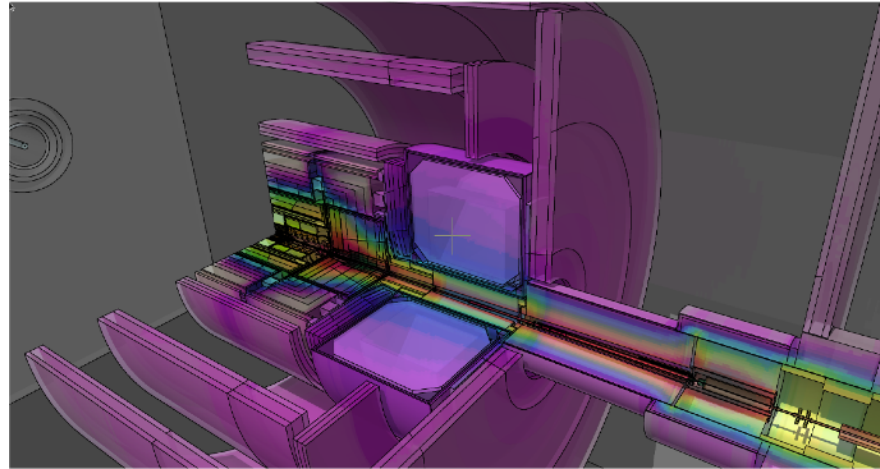


Detector Development Facilities

- Clean rooms with semiautomatic probe stations and automatic wire bonders for wafer testing and module assembly
- Test equipment for device testing
- Assembly areas, including thermal QC and metrology systems
- Sensor visual capture systems for sensor QC



Cleanroom for sensor testing



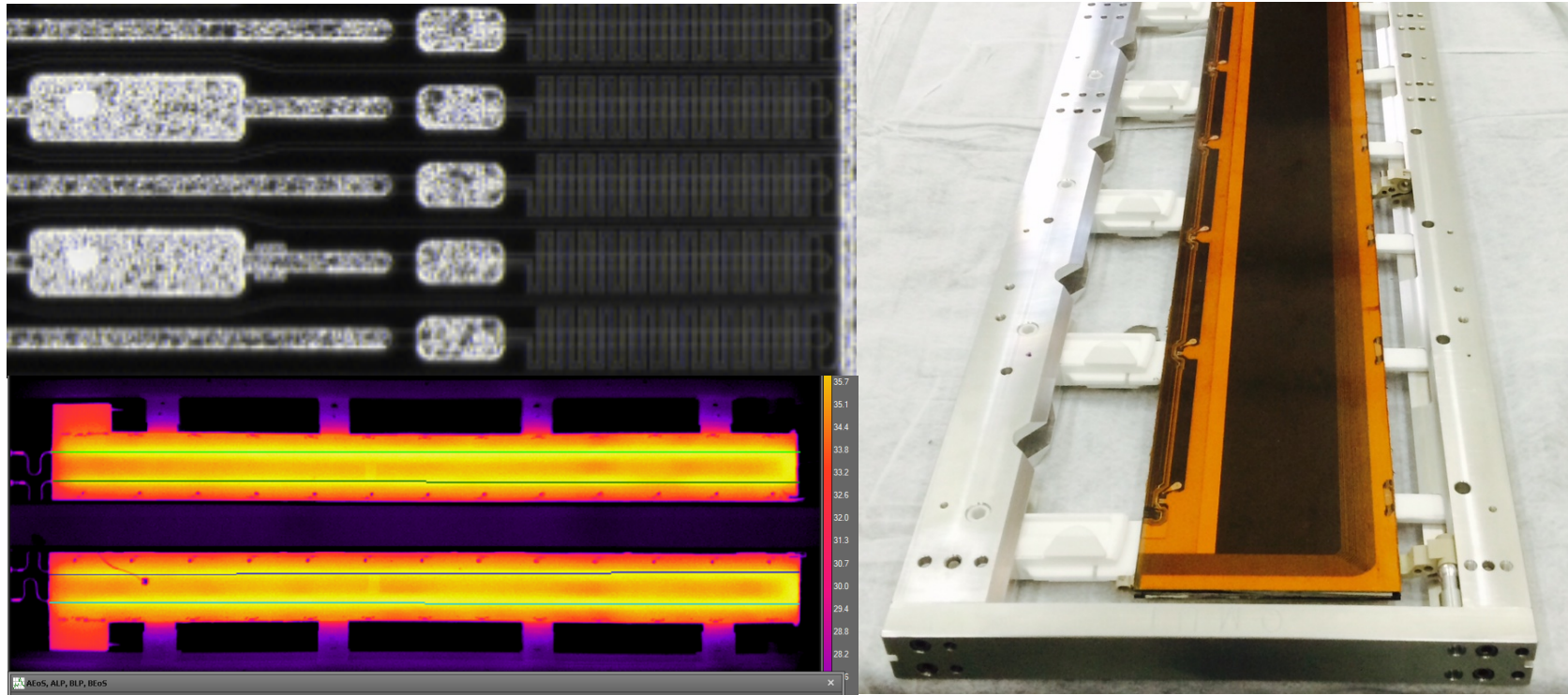
Broad simulation capability



New probe station for 300mm wafer probing
(in 2nd clean room)

Detector Development

- Focus on radiation sensing for particle physics
 - Silicon Detector Upgrade for ATLAS
 - Starting to work on the Belle 2 silicon detector upgrade



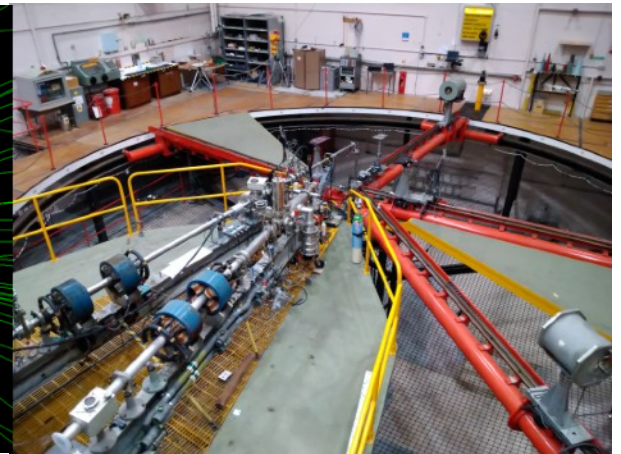
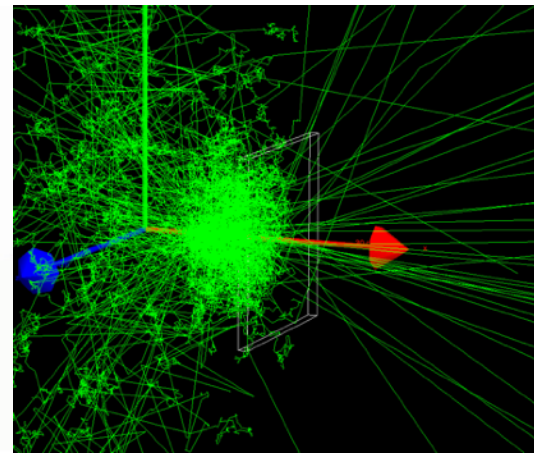
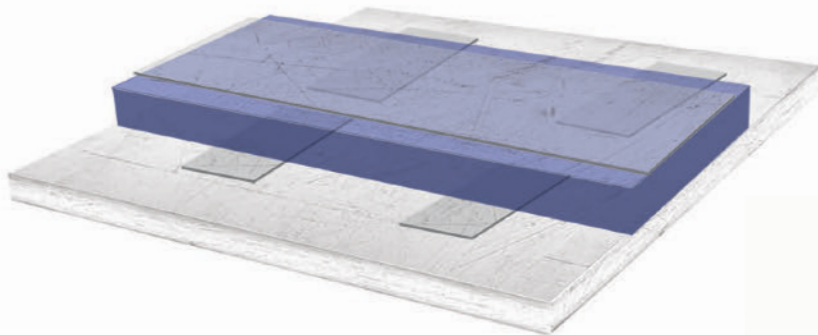
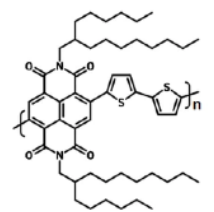
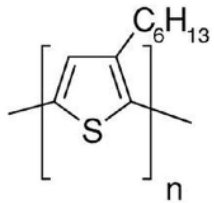
- Sensor testing
- Stave QC
- Precision mechanics for module mounting, stave transport and testing
- Design engineering solutions

Detector Development

R&D targeting novel technologies and real world applications include

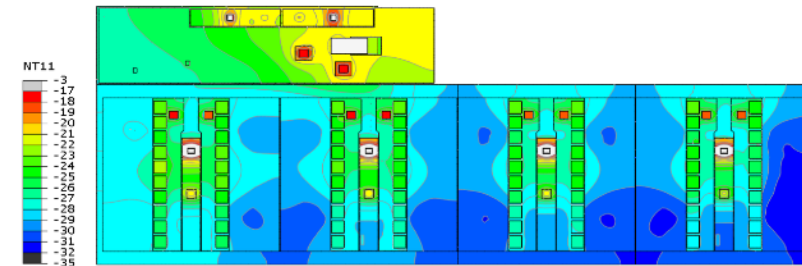
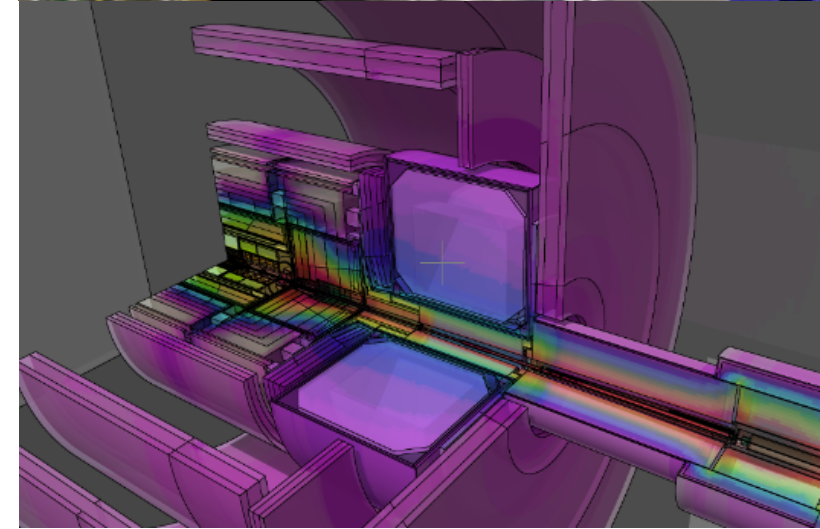
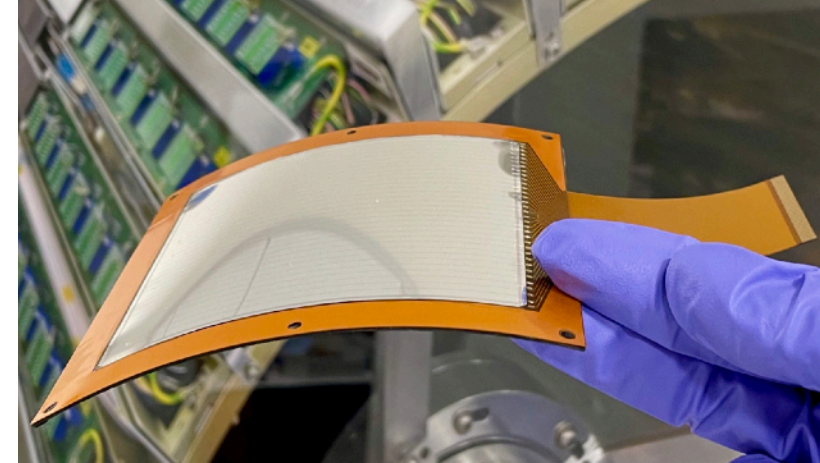
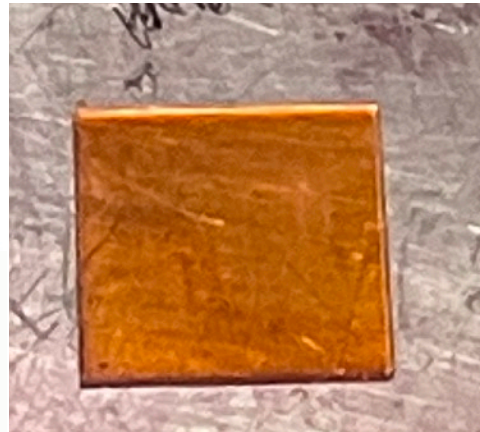
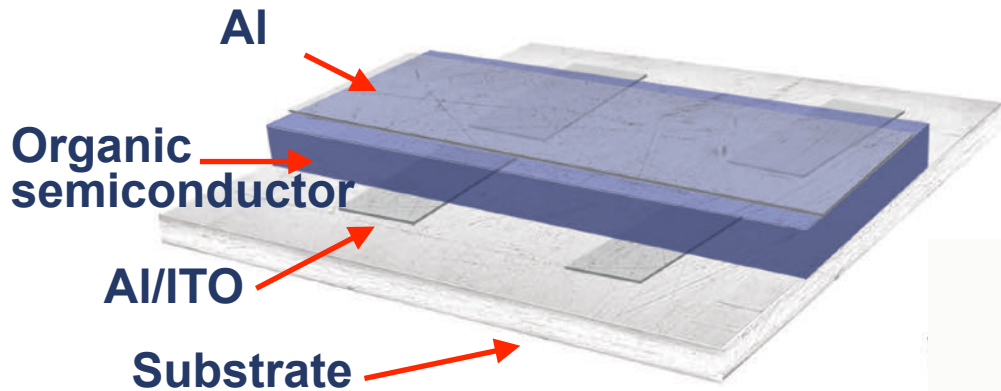
- Ultrathin curved silicon
- CVD Diamond
- Organic semiconductor radiation detectors
- Perovskite radiation detectors
- Long range alpha detectors
- Single electron quantum devices

Targeting medical, nuclear, space and basic research and development



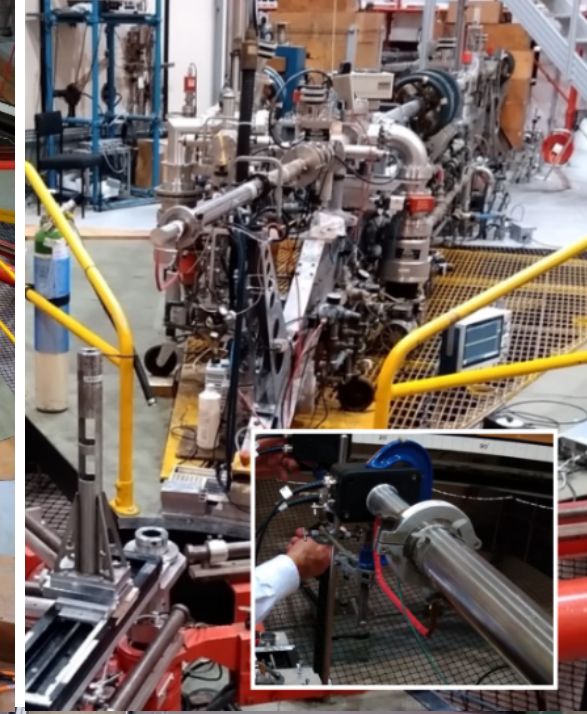
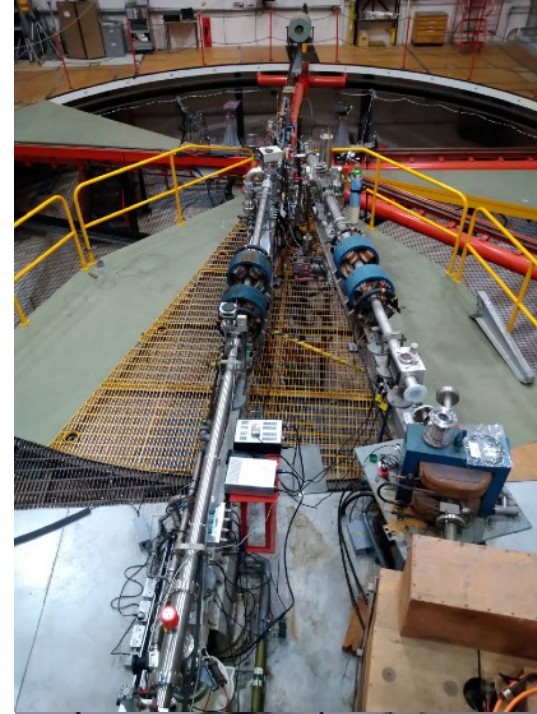
Detector Development

- Sensor and wafer testing
- Module design and assembly
- Radiation environment simulation
- Thermal simulation
- Mechanical design
- Precision mechanical engineering and systems integration
- Novel device fabrication and testing



Detector Development

- Well equipped laboratories
- Field test experience including
 - Test beam facilities
 - Neutron facilities
 - Sample irradiation
 - Research reactors



Detector Development

- Our research is funded by multiple public sources



- and funded or enabled via our commercial partners:



	Welcome and a history of detector development at QMUL <i>Skeel LT, People's Palace</i>	<i>Prof. A BEVAN</i> 09:30 - 09:55
10:00	ATLAS Inner Detector system and performance <i>Skeel LT, People's Palace</i>	<i>Bruce GALLOP</i> 10:00 - 10:25
	Coffee <i>Skeel LT, People's Palace</i>	10:30 - 10:55
11:00	CMS silicon detector and performance <i>Skeel LT, People's Palace</i>	<i>Suvankar CHOWDHURY</i> 11:00 - 11:25
	ALICE silicon detector and performance <i>Skeel LT, People's Palace</i>	<i>Ivan RAVASENGA</i> 11:30 - 11:55
12:00	LHCb silicon vertex detector <i>Skeel LT, People's Palace</i>	<i>David FRIDAY</i> 12:00 - 12:25
	Lunch	
13:00	<i>Skeel LT, People's Palace</i>	12:30 - 13:25
	Mu3E silicon detector <i>Skeel LT, People's Palace</i>	<i>Ashley MCDOUGALL</i> 13:30 - 13:55
14:00	Belle 2 vertex detector and performance <i>Skeel LT, People's Palace</i>	<i>Daniel PITZL</i> 14:00 - 14:25
	Silicon Vertex Tracker for the Electron-Ion-Collider <i>Skeel LT, People's Palace</i>	<i>James GLOVER</i> 14:30 - 14:55
15:00	Coffee <i>Skeel LT, People's Palace</i>	15:00 - 15:30
	Silicon Detectors for the FCC <i>Skeel LT, People's Palace</i>	<i>Attilio ANDREAZZA</i> 15:30 - 16:00
16:00	Silicon Detectors for the CEPC <i>Skeel LT, People's Palace</i>	<i>Yanyan GAO</i> 16:15 - 16:40
17:00	Reception	

09:00	ATLAS Inner Tracker Upgrade <i>Skeel LT, People's Palace</i>	Anastasia KOTSOKECHAGIA 09:00 - 09:25
	Break <i>Skeel LT, People's Palace</i>	09:30 - 10:00
10:00	ALICE silicon detector upgrades <i>Skeel LT, People's Palace</i>	Jian LIU 10:00 - 10:25
	Belle 2 silicon detector upgrade <i>Skeel LT, People's Palace</i>	Christian FINCK 10:30 - 10:55
11:00	Break/Tours <i>Skeel LT, People's Palace</i>	11:00 - 12:00
12:00	NA62 Gigatracker and silicon detector upgrade for HIKE <i>Skeel LT, People's Palace</i>	Alina KLEIMENOVA 12:00 - 12:25
	LHCb Upgrade 2 silicon detectors <i>Skeel LT, People's Palace</i>	Scott ELY 12:30 - 12:55
13:00	Lunch <i>Skeel LT, People's Palace</i>	13:00 - 14:00
14:00	CMS silicon detector upgrade <i>Skeel LT, People's Palace</i>	Giacomo FEDI 14:00 - 14:25
	Strasbourg CMOS R&D <i>Skeel LT, People's Palace</i>	Serhiy SENYUKOV 14:30 - 14:55
15:00	Coffee <i>Skeel LT, People's Palace</i>	15:00 - 15:25
	Bonn CMOS R&D <i>Skeel LT, People's Palace</i>	Christian BESPIN 15:30 - 15:55
16:00	DESY test beam facility <i>Skeel LT, People's Palace</i>	Adrian HERKERT 16:00 - 16:25

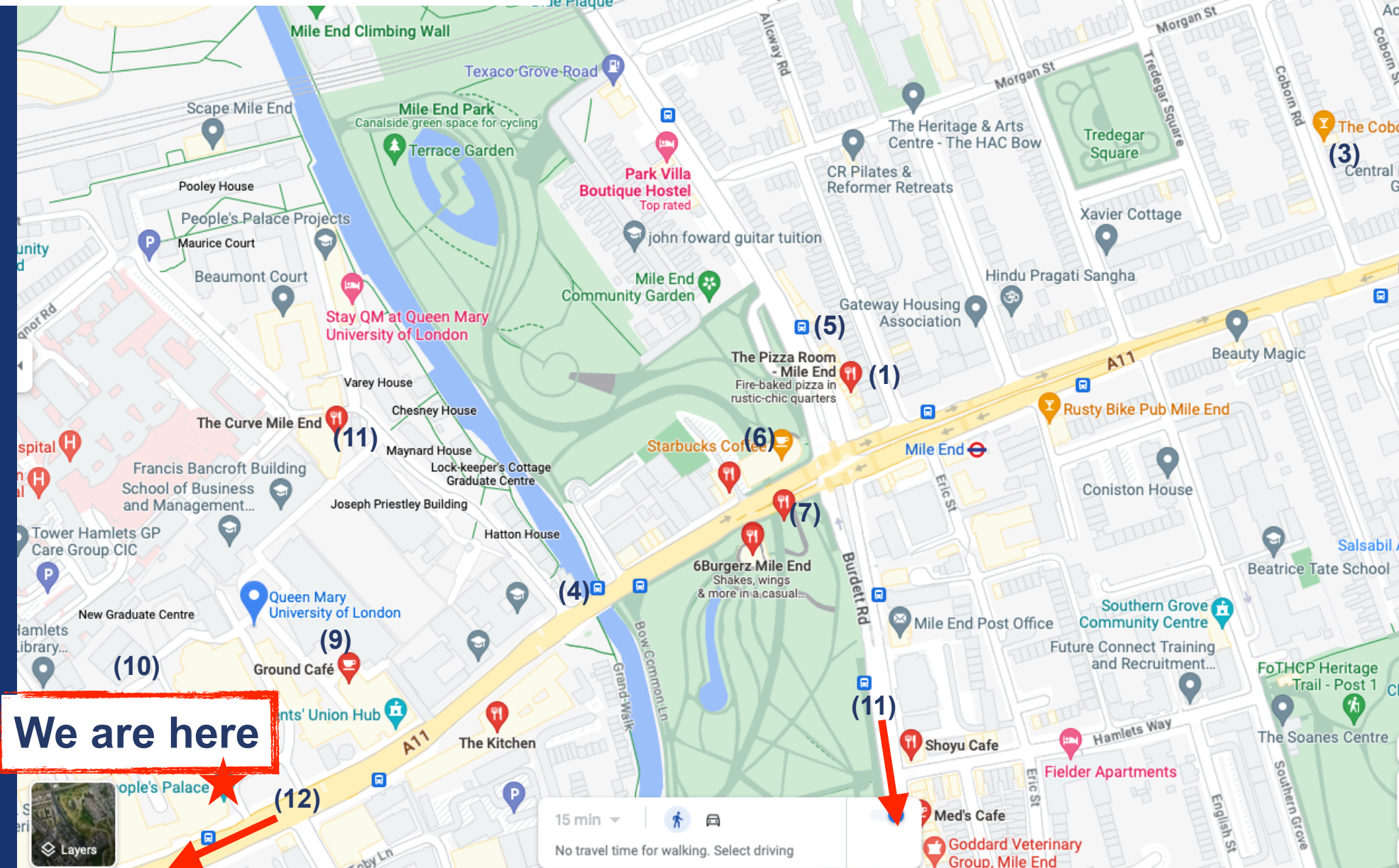
Dinner suggestions

- **Locally we recommend**
 - **The Lord Tradegar:** a nice local pub with good food and beer
 - **The Pizza Room:** good pizza
 - **The Coffee Room:** good coffee
 - **Lots of places nearby (see suggestions on the next page)**
- **A short walk or tube ride to Aldgate East will put you near Brick Lane. Lots of great Indian Restaurants in that part of town**
- **If you plan on sight seeing then a tube journey into town will give you plenty of options**
- **If you do a search in the local area you will find a number of other suggestions of places to eat (e.g. the other side of Victoria park)**



Some local eateries

* Student campus outlets, can have long queues during the day



Pizza

- 1. Pizza Room
- 4. Cherry Tree

Pubs:

- 2. Lord Tredegar
- 3. Coburn Arms

Coffee:

- 5. Coffee Room
- 6. Starbucks
- 7. Costa
- 8. The Curve (*)
- 9. Ground (*)
- 10. Grad Centre (*)

Other

- 11. Ariana (Persian)
- 12. Efes (Turkish)

QMUL's Detector Development Group

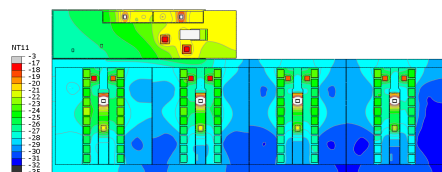
A multidisciplinary team of experts working on

- Novel radiation sensing technologies
- Instrument design and construction
- Radiation damage simulation

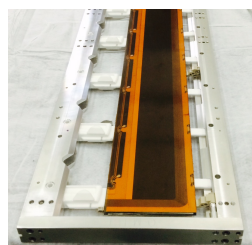
for particle physics and industrial application



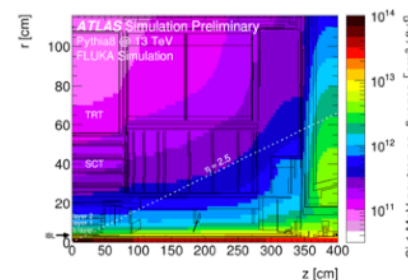
Silicon strip sensors for LHC



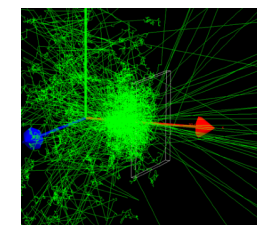
Heat transfer simulation for detector system cooling design



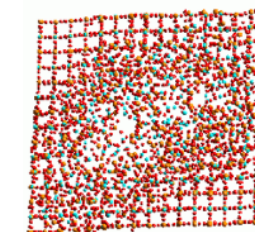
Module assembly engineering



FLUKA radiation environment simulations



Geant4 sensor interaction simulations for neutron detector development



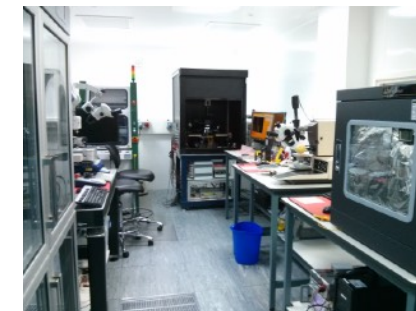
DL_Poly material damage simulation

Technologies

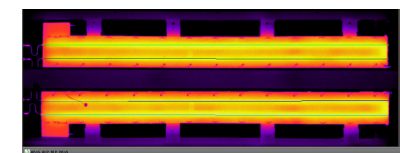
Quantum
Diamond
Silicon
Organics
Graphene
Perovskite
Scintillator

Simulation

ABAQUS
DL_POLY
FLUKA
GEANT4
MCNP6
Zeemax



Fully equipped ISO 7 certified clean room



Infra-red thermal imaging system