



Welcome to the UK DRD3 Instrumentation Summer School

Daniel Hynds

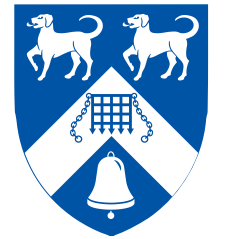
Welcome!

Welcome to the second iteration of the UK DRD3
Instrumentation Summer School

- <https://indico.global/e/ukhepinst2026>

This is the second edition of the school - the intention is to run
biannually depending on whether or not anyone turns up...

UK DRD3 Instrumentation Summer School



10 – 21 August 2026
Lady Margaret Hall
University of Oxford

**2 weeks of hands-on labs and small group
tutorials on silicon detector technology for PhD
students and early career researchers**

- **Device fabrication and performance simulations**
- **Electronics for particle physics**
- **Electrical characterisation of silicon detectors**
- **Signal generation and particle detection**



**Apply by
29 May 2026**

<https://indico.global/e/ukhepinst2026>

School Directors
Daniel Hynds | **University of Oxford**
Richard Bates | **University of Glasgow**

The University of Oxford

The University of Oxford has been around for a while...

- Evidence of teaching from 1096
- 39 Colleges and 4 permanent private halls
- Home of numerous Nobel prize winners
(notable: Roger Penrose, 2020, Erwin Schrödinger, 1933)
- Of the 19 prime ministers since 1945, **13** attended Oxford

Currently sitting in the Denys Wilkinson Building

- Opened in 1967 as the Nuclear Physics Laboratory with 2 accelerators: a vertical 10 MV van de Graaff and horizontal 6.5 MV EM tandem



Motivation for the school

UK community discussions in 2022 highlighted lack of training opportunities for instrumentation. The UK has historically had a large silicon community so we started there

- Online lecture series established in 2022, moved international in 2023 and continues annually to 200+ participants
- ~60 hours of material presented online by UK lecturers over an 8 week period
- <https://indico.global/e/ukinst2026>

First iteration of this school held in 2024 (Jesus College) and again this year in Oxford (LMH). 2028 in...?

Advanced UK Instrumentation Training 2026

4 May 2026, 09:00 → 4 Jul 2026, 17:00 Europe/London

Description This series of online lectures started in 2022, with the intention to support UK PhD student training in instrumentation, along with continued development of postdocs and beyond. At present, it is geared towards the needs of the silicon/semiconductor community, and arose from internal UK community discussions which took place during 2021. In 2023, participation was opened beyond the UK to the international community in the hopes that it could prove useful.

The courses focus on the background knowledge involved in silicon detector development, from solid-state theory to electronics and remote software tutorials. Lectures are grouped into the following themes:

- Semiconductor Theory
- Electronics and DAQ
- Mechanics and cooling
- Fabrication and structures
- Experimental techniques
- TCAD electric field and transport simulations
- Software tools
- Short topics

Each lecture course consists of ~8 one-hour lectures, with lectures grouped into two 4-hour slots each week.

For the 2026 iteration, lectures will be run on:

- Tuesday afternoons 13:00 - 17:00 BST
- Friday mornings 9:00 - 13:00 BST

in the weeks beginning May 4 - June 22 inclusive.

Registration is open to everyone, and attendance is not enforced. Attending a subset of courses is entirely acceptable. The courses are run as a community effort on a voluntary basis by UK-based lecturers, but feedback on the layout and topics will be welcome with the aim of future improvements.

Registration is required in order to provide zoom connection details and send updates to the timetable in the event that lectures have to be rescheduled.

In 2024 there was a hands-on residential summer school building upon the material presented in the online lectures. This took place in the first two weeks of July at the University of Oxford. More details can be found at: <https://indico.global/e/ukhepinst2024>

The school is planned to be held bi-annually, with the next iteration to be held this year, again at the university of Oxford. More details, including

Overview

The timetable can be seen online:

- <https://indico.global/event/17679/timetable/#20260810>

Broadly speaking will follow the design cycle of a “simple” PIN diode + LGAD, from TCAD => design and simulation of the readout => characterisation => detection of particles

	Monday	Tuesday	Wednesday	Thursday	Friday	Weekend	Monday	Tuesday	Wednesday	Thursday	Friday
Group 1	Introduction	Device simulation		Electronics and simulation		Free	Labs: electrical characterisation		Labs: particle detection		Visit to ISIS and CLF
Group 2		Labs: particle detection		Device simulation			Electronics and simulation		Labs: electrical characterisation		
Group 3		Labs: electrical characterisation		Labs: particle detection			Device simulation		Electronics and simulation		
Group 4		Electronics and simulation		Labs: electrical characterisation			Labs: particle detection		Device simulation		
Evening activity		Evening talk	Evening talk	Evening talk			Evening talk	Evening talk	Evening talk	Formal dinner	

Philosophy

There are a mix of different experiences attending the school - we will try to be inclusive but can use the small group sizes to go through topics quicker or slower depending on whether you have been exposed to material before

We want you to ask **WHY!**

There are no more lectures beyond today, sessions may use 10-20 slides to show information or what is planned but for the main part this will be hands-on or discussion over a whiteboard with the tutors

In most cases there will either be 6 or 3 students to one tutor: *you cannot hide from us*

Evening talks, closeout and weekend plans

There will be evening talks most evenings from 17:30 - 18:30 in LMH.

This week:

- Tuesday: Sarah Boutle - from physics to the real world
- Wednesday: Craig Sawyer - a series of unfortunate events
- Thursday: Robert Masters - technology from Oxford Instruments

Next week talks will be Monday - Wednesday, then a 'formal dinner' on Thursday

For the weekend you are **free to explore**, but we have booked some punts in LMH for Sunday afternoon 14:00 - 17:00, followed by pizza

The last half-day will have no labs but a visit to nearby Harwell Campus to see the ISIS neutron and muon source and Central Laser Facility



Tutors

Lars Eklund, Uppsala



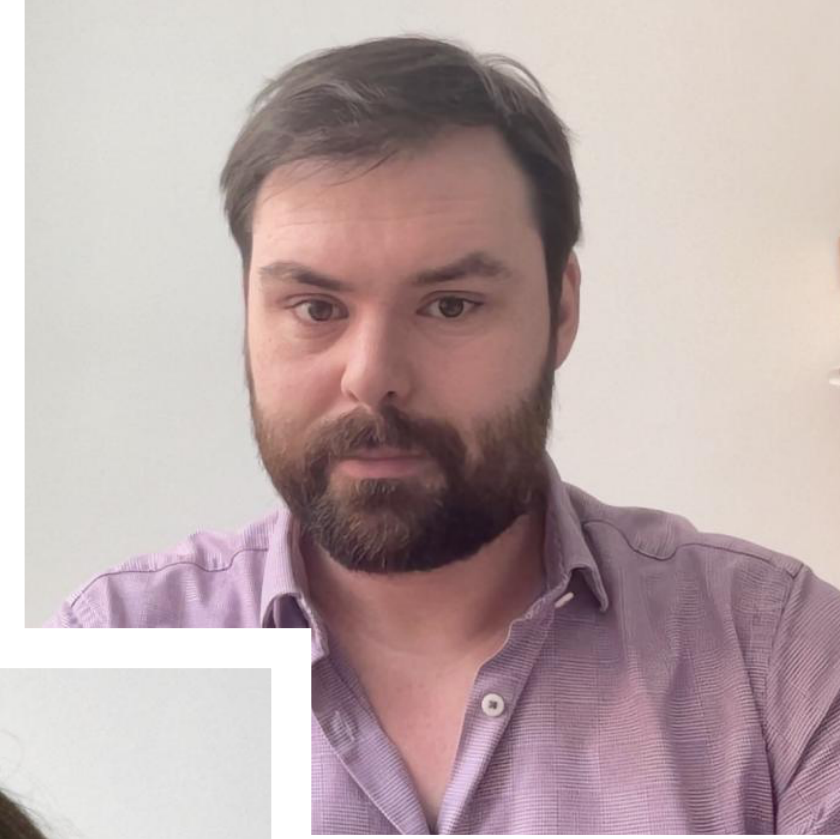
Richard Bates, Glasgow



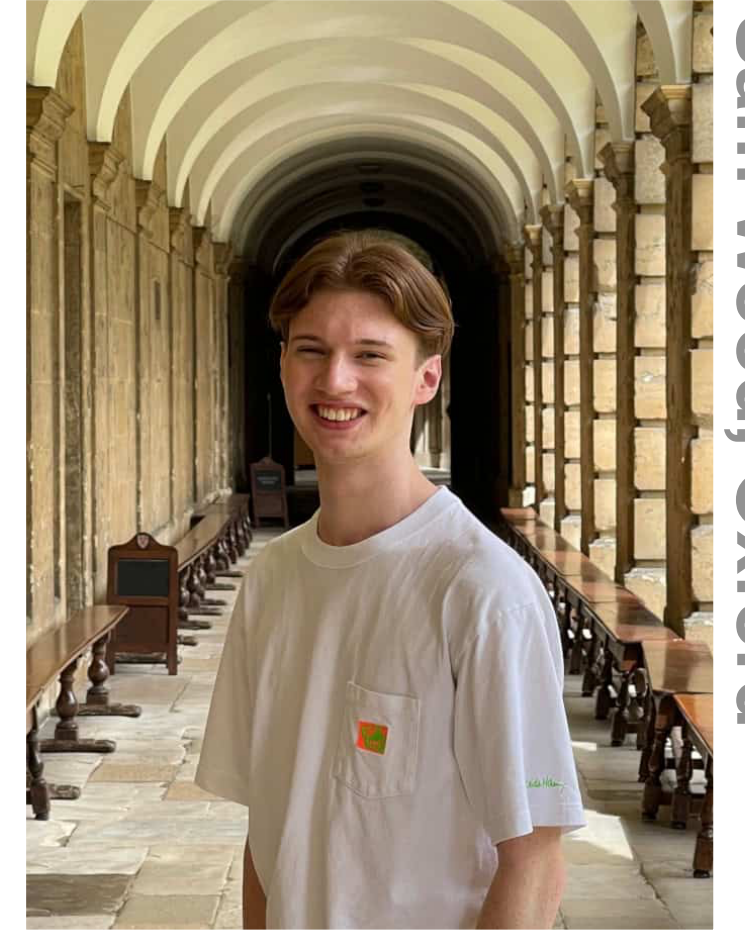
Richard Plackett, Oxford



Daniel Hynds, Oxford



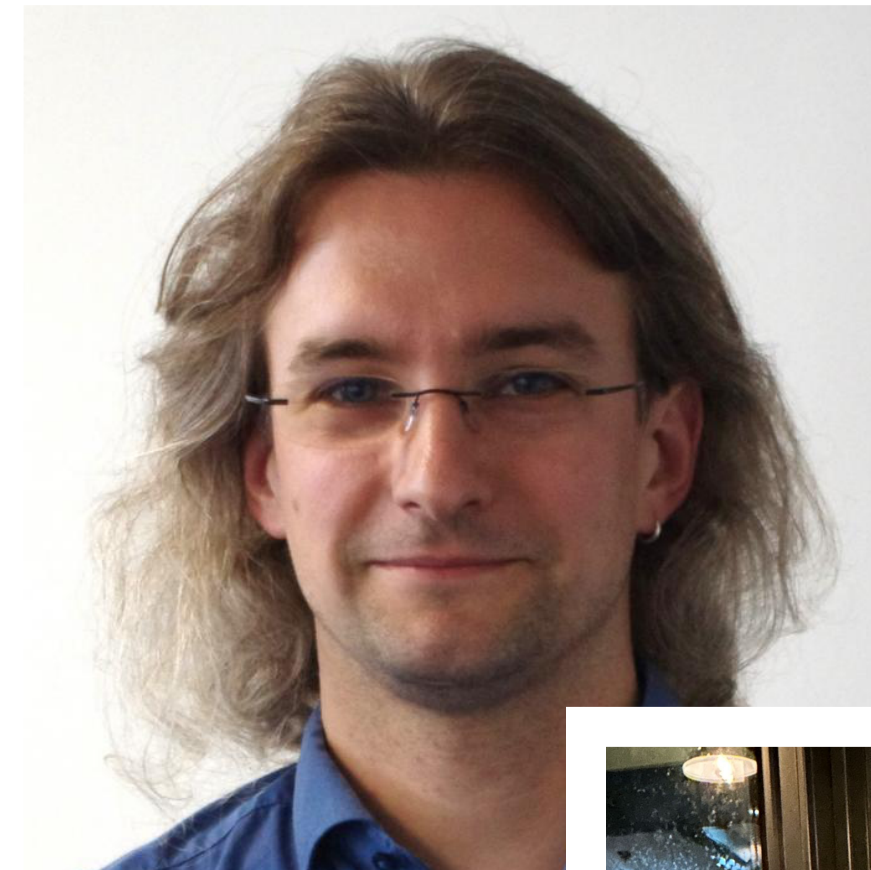
Sam Wood, Oxford



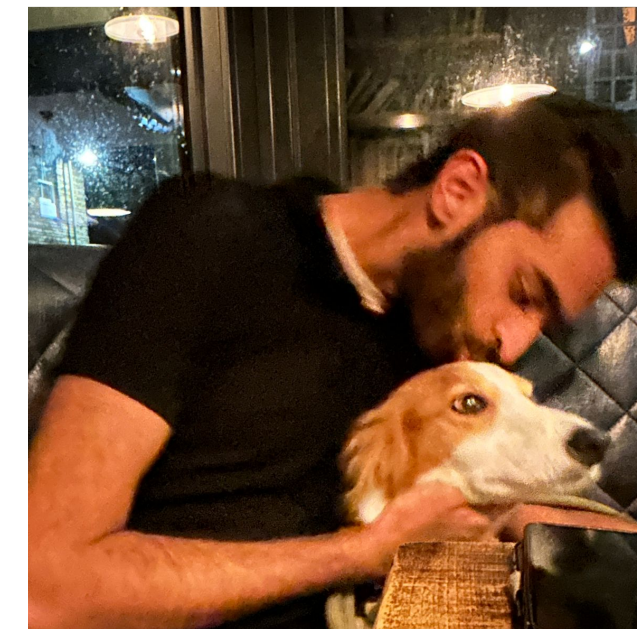
Giulio Villani, RAL



Dan Weatherill, Caltech



Jens Dopke,
RAL



Jay Patel, Oxford

OPMD

Those of us from Oxford are part of OPMD - the 'Oxford Physics Microstructure Detector' Laboratory

- Set up in ~2015 by Prof Ian Shipsey and Prof Daniela Bortoletto
- Currently consists of 1 Professor, 2 permanent staff, 3 PDRAs, 4 technical staff and 6 DPhil students

Extensive cleanroom to take part in both R&D and large scale build projects

- Responsibilities for ITk pixel, Mu3e outer tracker, formerly LSST and AION/MAGIS

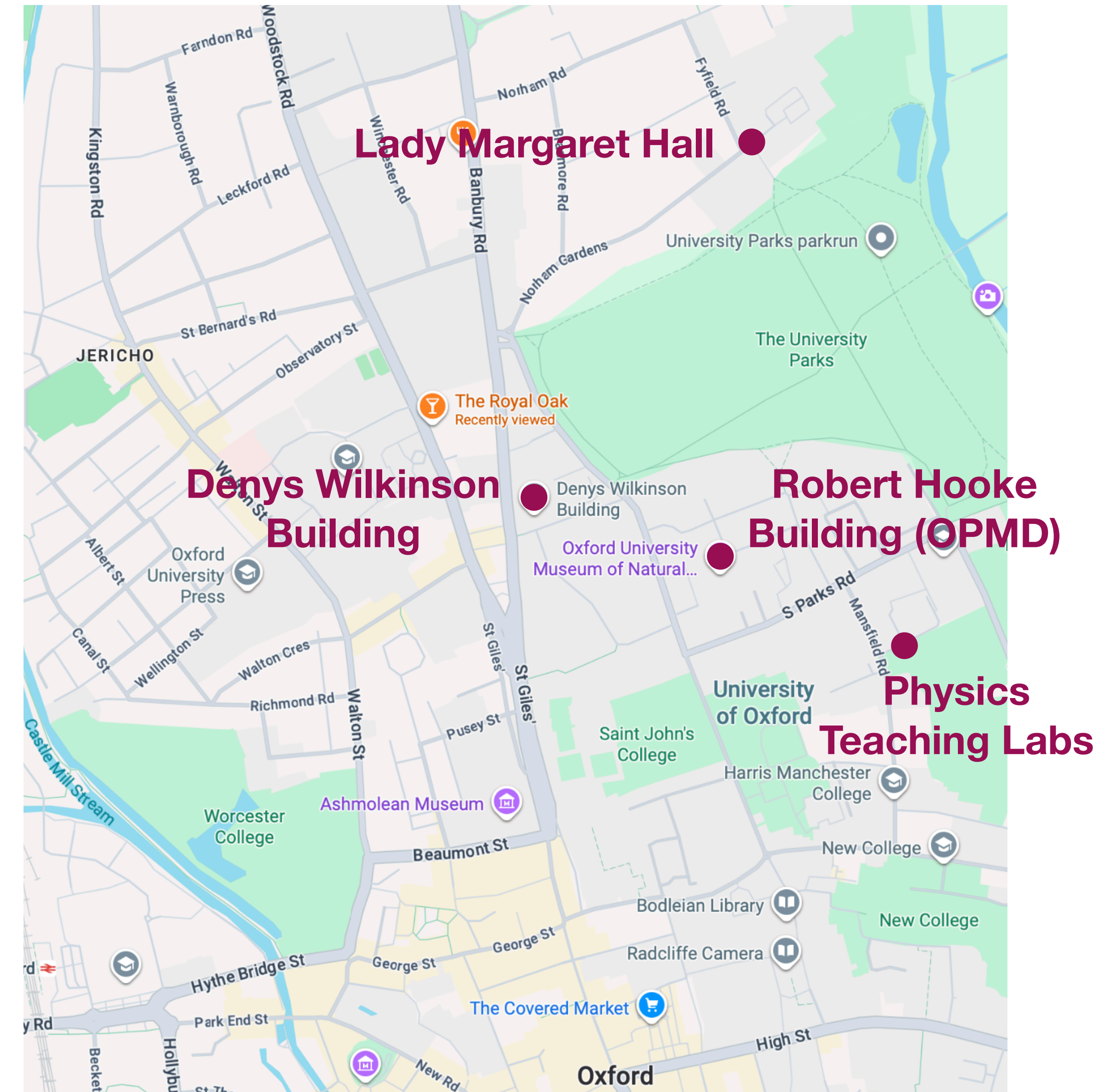


Navigation

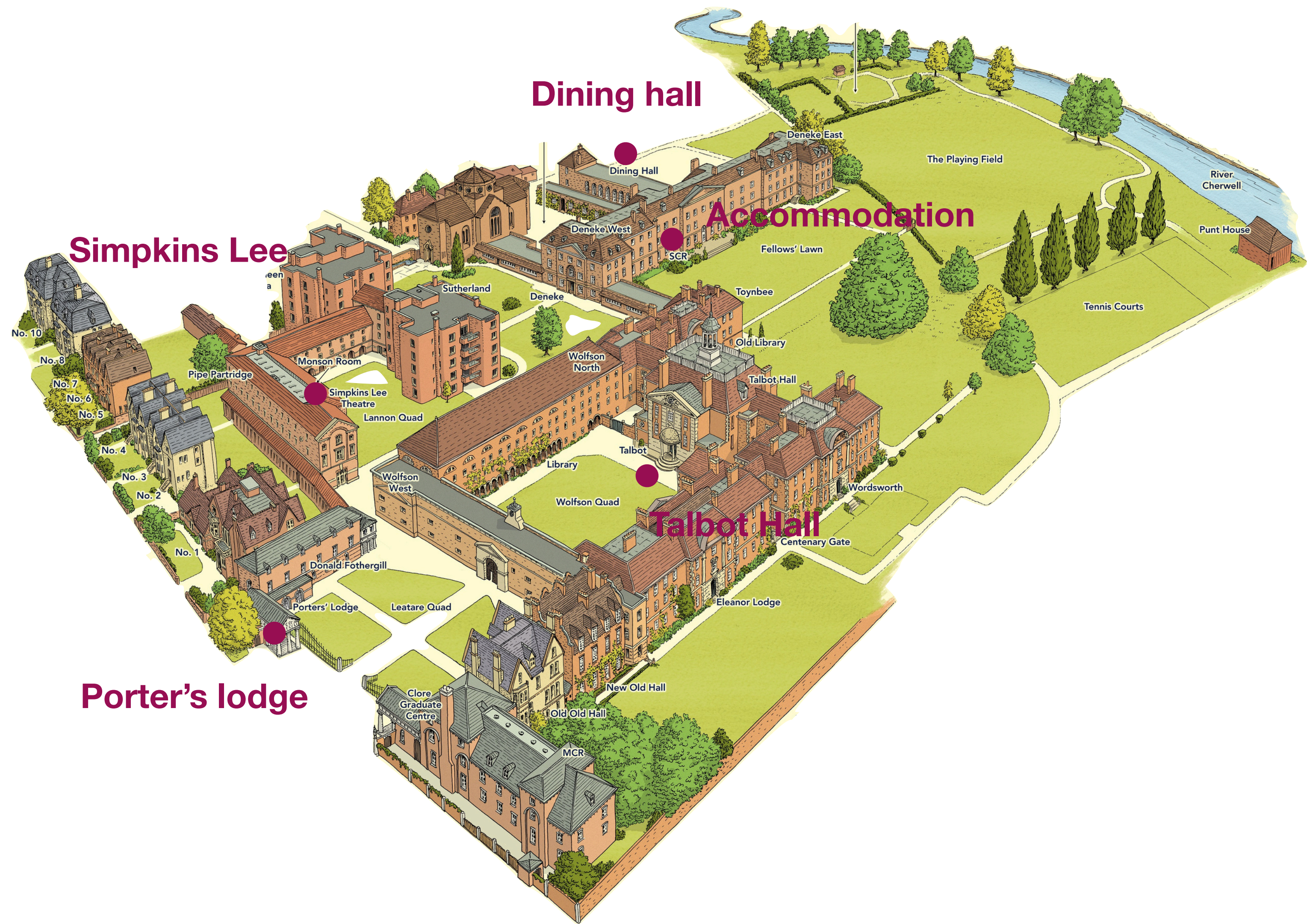
Labs and tutorials will be split across two buildings: the **Physics Teaching Labs** in Mansfield Road and the **Robert Hooke building** where the OPMD lab is located

Everyone will be housed in **Lady Margaret Hall**, which is around 10 minutes by foot from where we are

Any concerns or emergencies please feel free to contact me on **+44 789 267 2064**



Navigation



Lady Margaret Hall



Accommodation, breakfast, dinner and evening lectures will all be in Lady Margaret Hall

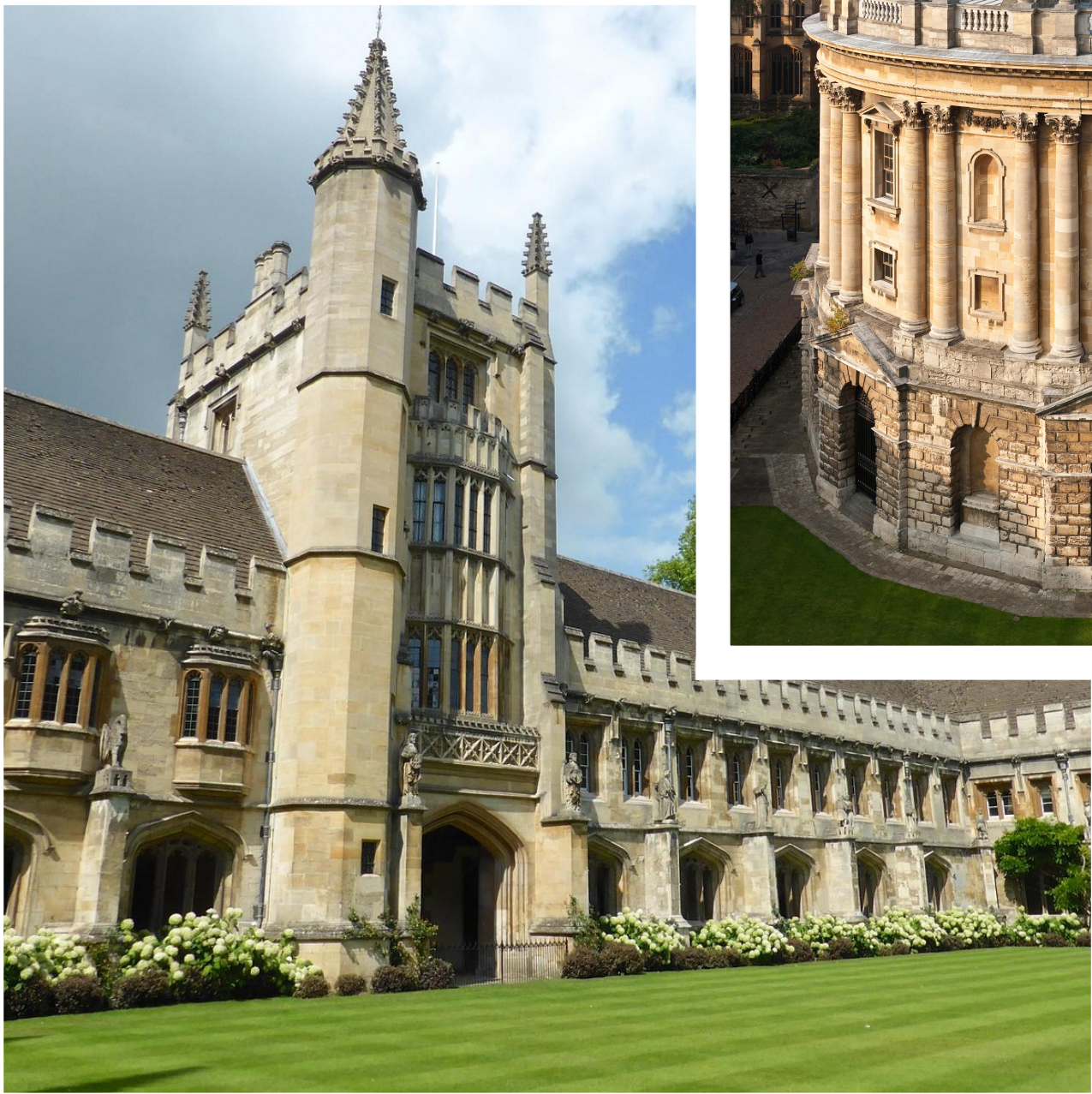
- Founded in 1878 as a woman's college
- Named for Lady Margaret Beaufort, mother of Henry VII

Navigation - sightseeing

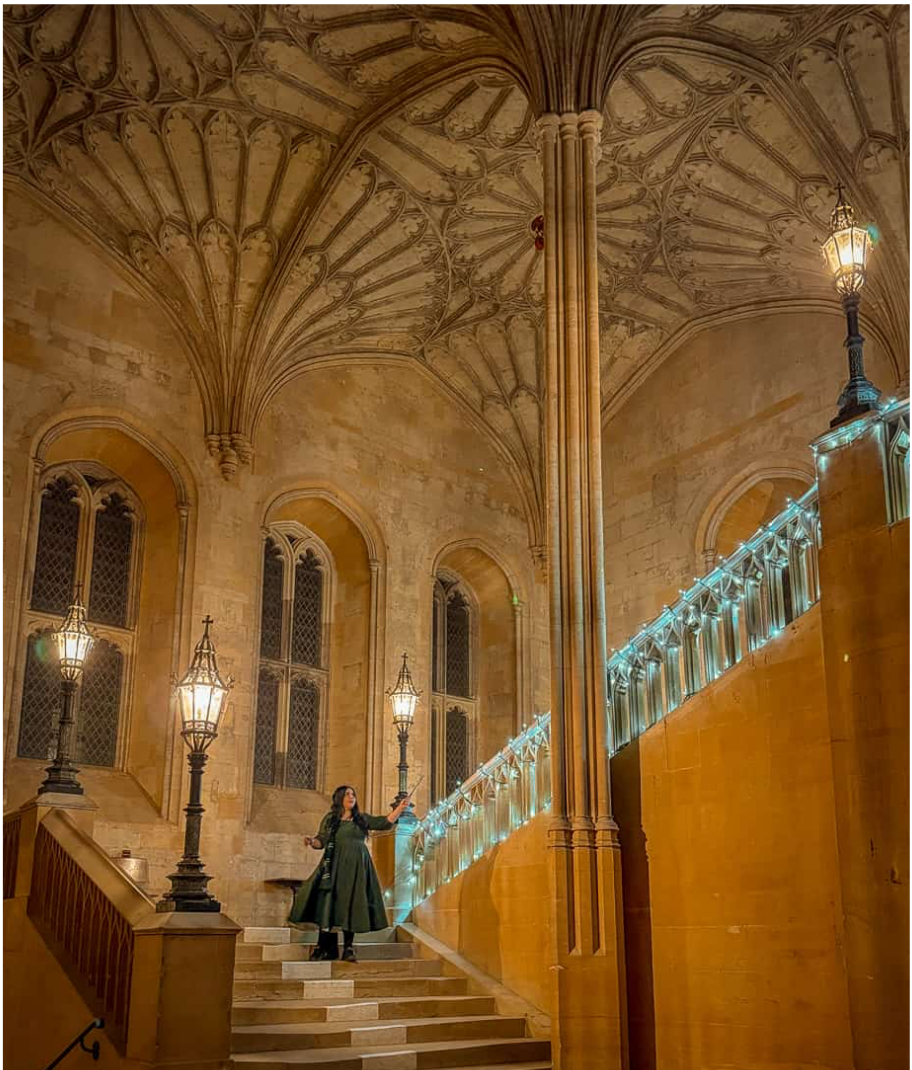
Radcliffe Camera



Keble College Chapel

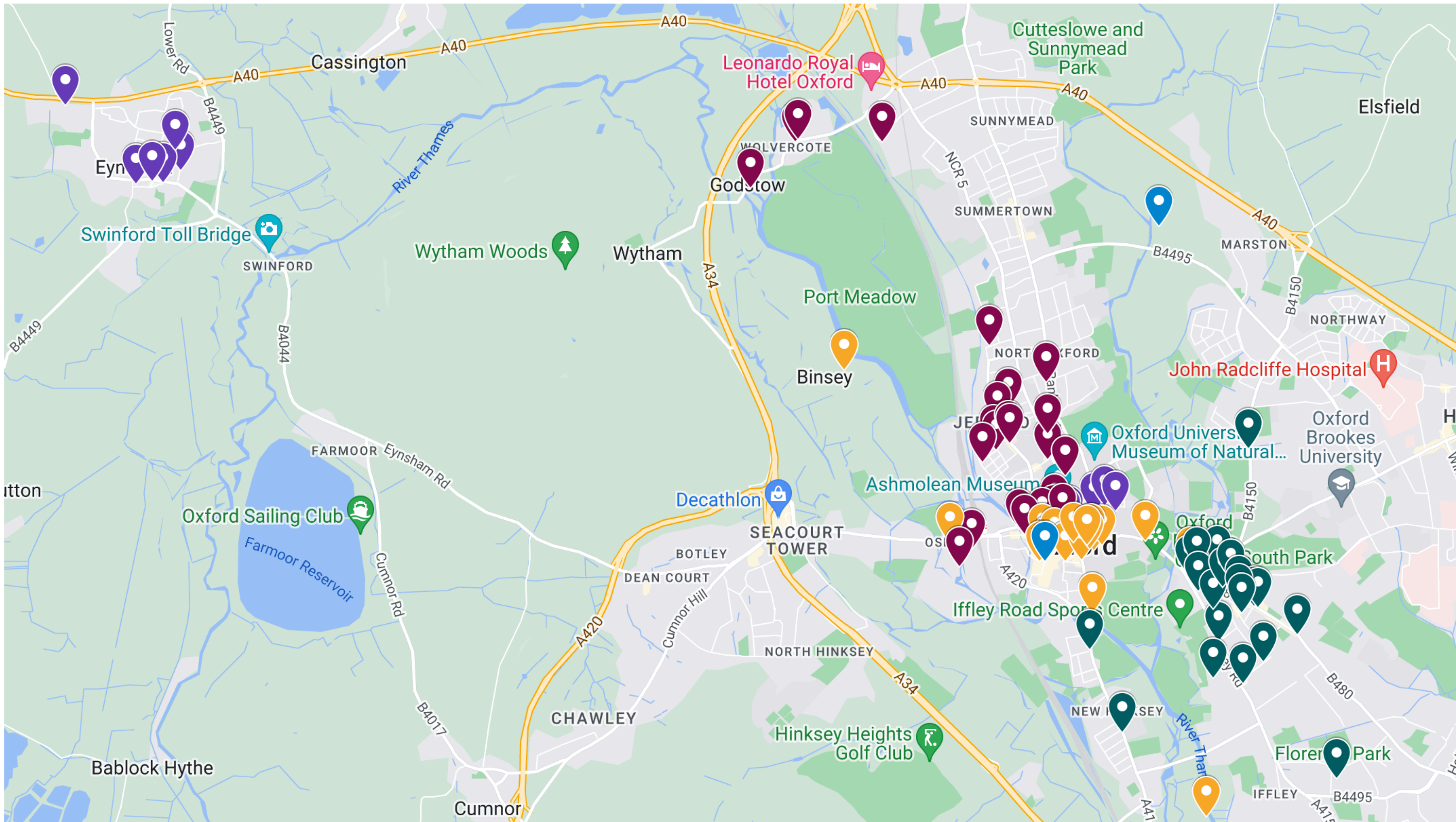


Magdalen College Grounds



Christ Church College

Navigation - refreshments



Full details

Some practical times

Meals

- Breakfast: 7:30 - 9:30 in LMH
- Lunch: 12:30 - 13:30 in the physics teaching labs
- Dinner: 19:00 - 19:45 in LMH

Meeting points

- Will be mailed each evening, but either in front of the **Physics Teaching Labs** in Mansfield Road or the **Robert Hooke building** (OPMD)



Any questions?