



**Welcome!**

Daniel Hynds

# Welcome!

Welcome to the first iteration of the UK HEP Instrumentation  
Summer School

- <https://indico.cern.ch/e/ukhepinst2024>



## UK HEP Instrumentation Summer School

1-12 July 2024  
Jesus College  
University of Oxford, UK



<https://indico.cern.ch/e/ukhepinst2024>



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

Application deadline: **3 June**

## Motivation for the school

Large UK involvement in construction projects over the last ~15 years, in some cases at the expense of R&D

Shifting focus towards new detectors for the future, but a need to train new physicists

- Online lecture series established in 2022, moved international in 2023 and > 270 registrants for 2024
- ~60 hours of material presented online by UK lecturers
- <https://indico.cern.ch/e/ukinst2024>

This school is intended as a follow-on from this

### Advanced UK Instrumentation Training 2024

22 Apr 2024, 09:00 → 22 Jun 2024, 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 2024 iteration, lectures will be run on:**

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

**in the weeks April 22 - June 10 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.

**This year there will be a hands-on residential summer school which builds upon the material presented in the online lectures. This is scheduled for the first two weeks of July at the University of Oxford. More details can be found at:**

<https://indico.cern.ch/e/ukhepinst2024>

# Overview

The timetable can be seen online:

- <https://indico.cern.ch/event/1416539/timetable>

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	Week end	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Group 1</b>	Introduction	Device simulation	Electronics and simulation		Free		Labs: electrical characterisation	Labs: particle detection		Closeout	
<b>Group 2</b>		Electronics and simulation	Device simulation				Labs: particle detection	Labs: electrical characterisation			
<b>Group 3</b>		Labs: electrical characterisation	Labs: particle detection				Device simulation	Electronics and simulation			
<b>Group 4</b>		Labs: particle detection	Labs: electrical characterisation				Electronics and simulation	Device simulation			
<b>Evening activity</b>		College tour		Industrial careers			UK infrastructure ?		College dinner	Academic careers	



- ✦ ATLAS ITk pixel module coordinator
- ✦ LGAD sensor development
- ✦ RD50 Novel structures coordinator
- ✦ 3D Silicon detectors
- ✦ ATLAS ID cooling
- ✦ ATLAS SCT endcap system test
- ✦ ATLAS SCT endcap modules
- ✦ 3D GaAs detectors
- ✦ GaAs for medical X-ray imaging
- ✦ GaAs for the ATLAS SCT

## Richard Bates

Reader in Detector Development

Experimental PP group

Glasgow University



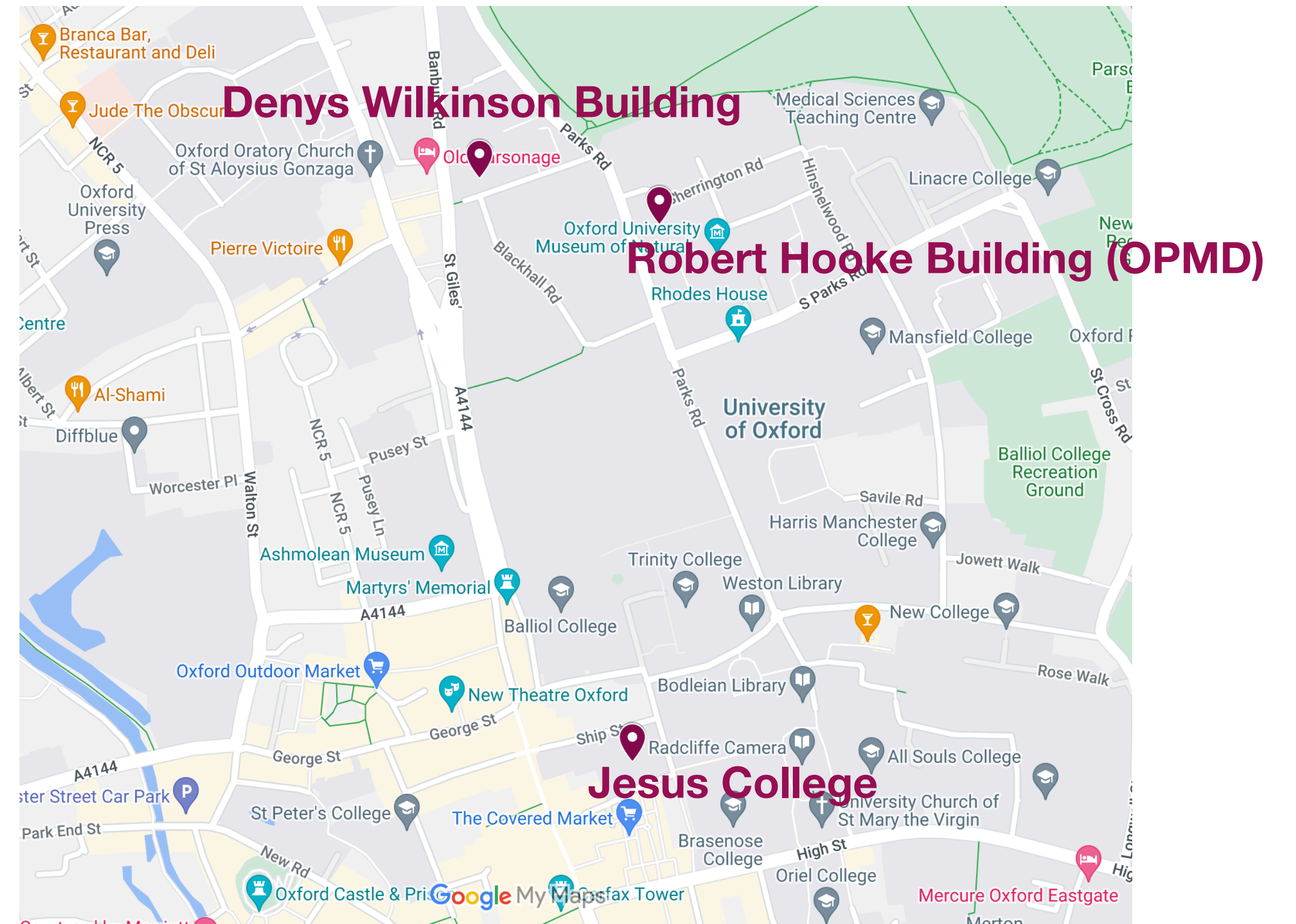
## Navigation

Labs and tutorials will be split across two buildings: the one we are currently in (DWB) and the Robert Hooke building where the OPMD lab is located

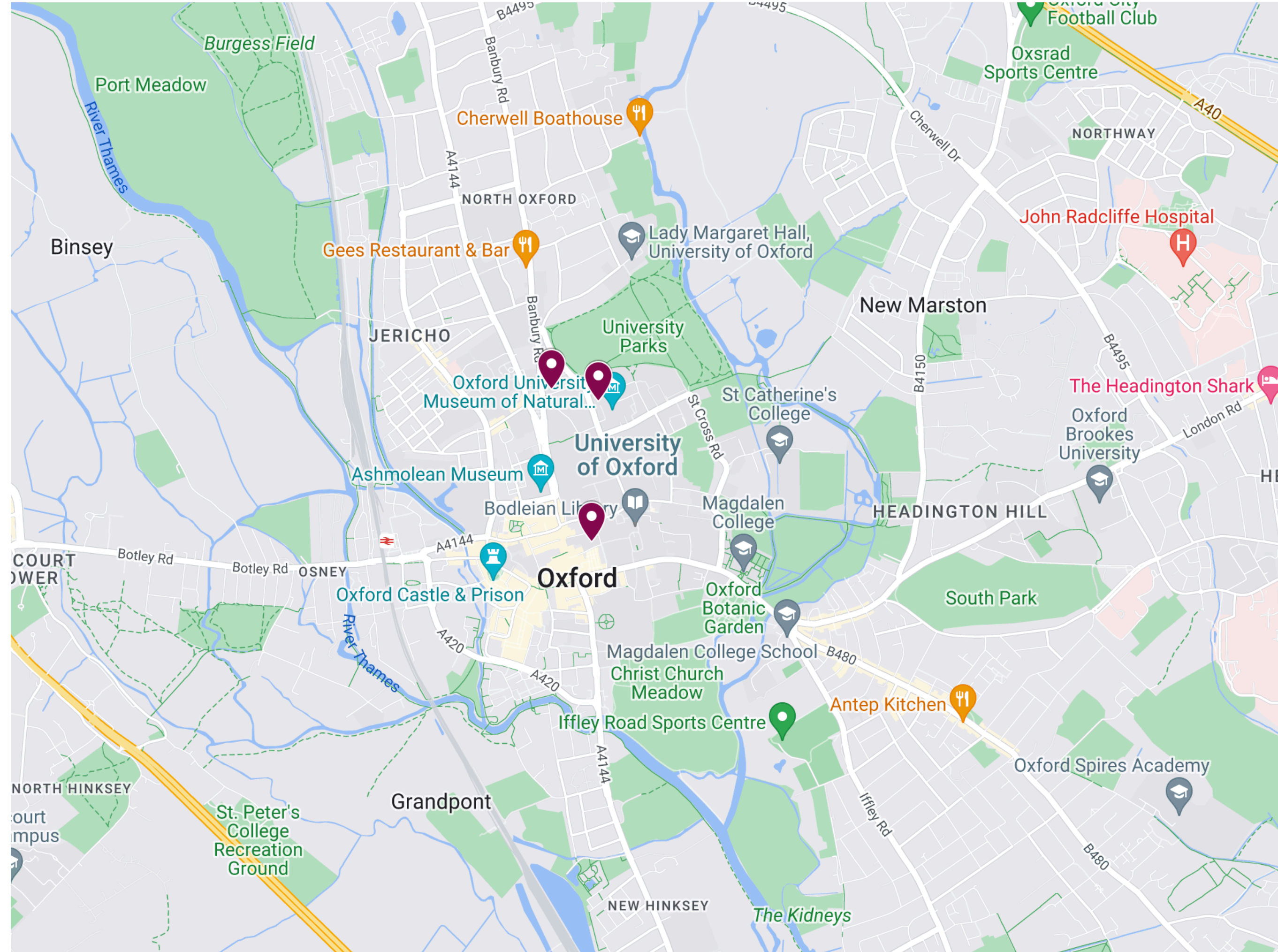
Everyone will be housed in Jesus College, which is around 10 minutes by foot from where we are

- There are two accommodation blocks: one on Ship Street and one on Cornmarket Street, ~1 minute from the college lodge

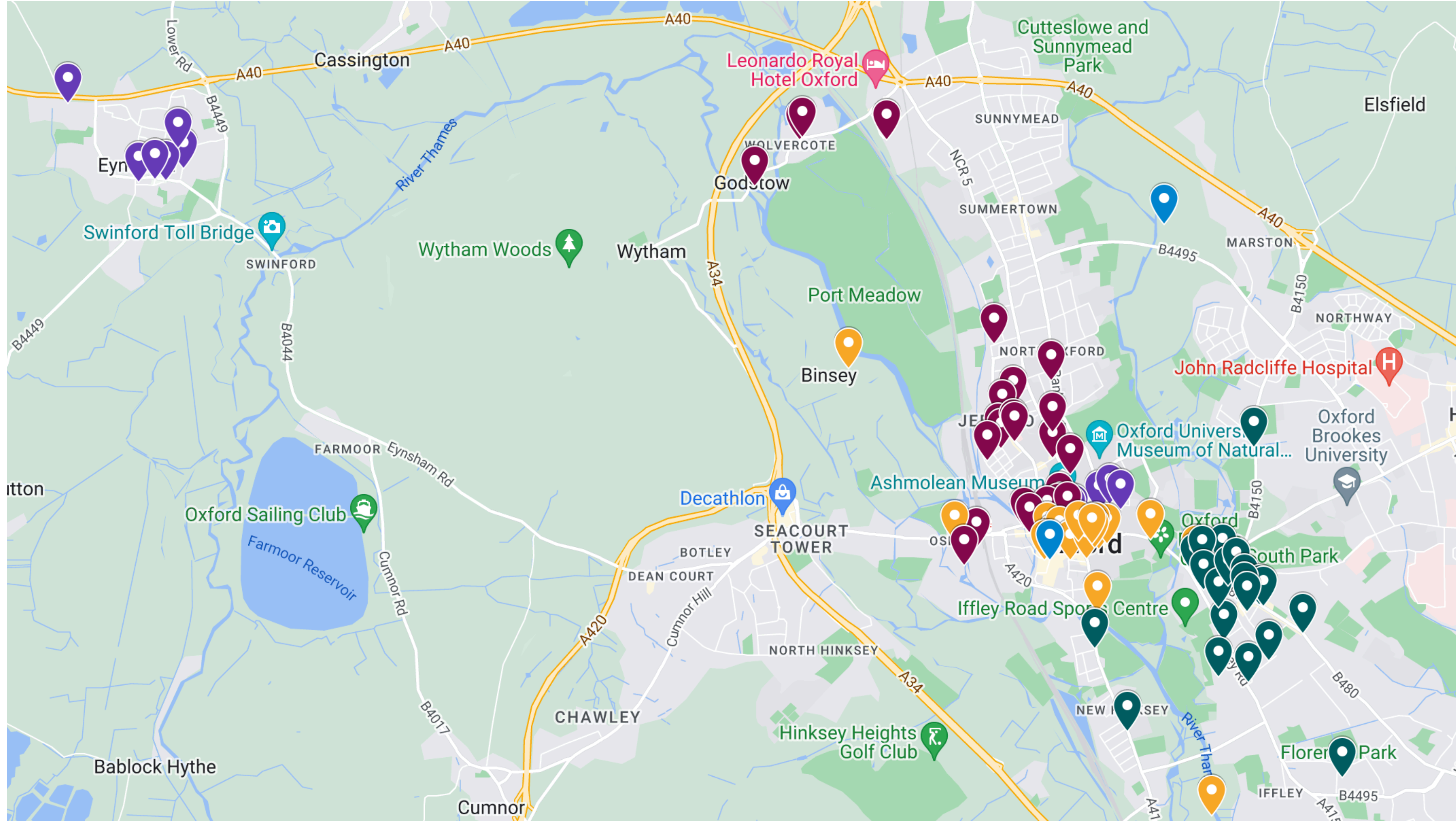
Any concerns or emergencies please feel free to contact me on 0044 789 267 2064



# Navigation



# Navigation - refreshments





## Some practical reminders

### Meals

- Breakfast: 7:45 - 8:15 in Jesus College
- Lunch: 12:30 - 13:30 in the DWB (teaching labs)
- Dinner: 18:30 - 19:00 in Jesus College

### Meeting points

- Will be mailed each evening, but either in front of Denys Wilkinson Building or Robert Hooke Building (OPMD)
- We will see all meeting points on the walk to Jesus College this evening



**Any questions?**