

**VISIT TO CAVENDISH LABORATORY, CAMBRIDGE**

**on Thursday 5<sup>th</sup> May 2011**

---

This visit has been organised by John Belling.



The Cavendish was opened in 1874, under the direction of James Clerk Maxwell, as the Laboratory of Physics at the University of Cambridge, one of the first teaching laboratories in England. Research in the Cavendish has led to a number of the most important discoveries in physics including JJ Thomson's discovery of the electron (1897), the Cloud Chamber invented by CTR Wilson (1895 – 1913), Rutherford's discovery of artificial nuclear fission (1919), discovery of the neutron by James Chadwick (1932), first controlled nuclear disintegrations using a particle accelerator designed by J Cockcroft and E Walton, Lawrence Bragg's development the use of X-ray

crystallography as a powerful tool for understanding the structure of biological molecules (1938), the determination of the double-helix structure of the DNA molecule by F Crick and J Watson (1952), and the discovery of neutron stars as the parent bodies of pulsars by A Hewish and J Bell-Burnell in 1968.

Up to 1974, the Cavendish Laboratory was situated in the city centre, in Free School Lane, now adjacent to the Whipple Science Museum. By the 1970s, the site in had become so overcrowded that a move to a new green-field site in West Cambridge, managed by Brian Pippard, Cavendish Professor, was deemed necessary.

The move was completed in 1974 and a completely new phase of discovery began. Large facilities were developed in radio astronomy and semiconductor physics, which continue to be frontier areas of research within the Laboratory. Completely new disciplines were fostered. With Sam Edwards' appointment as Pippard's successor in 1984, soft condensed matter became a major component of the Laboratory's programme. This led in turn to major initiatives in biological physics and the physics of medicine. Polymer semiconductor physics has flourished under Edwards' successor Richard Friend. In the first decade of the 21st century, new frontiers have been opened up in the areas of nanotechnology, cold atoms and ultra-low temperature physics.

You can view a comprehensive history of the Cavendish at <http://www.phy.cam.ac.uk/history/>.

Our visit today will start with refreshments taken in the foyer of the Pippard Lecture Theatre.

We will then be given a presentation on the history and current research at the Cavendish in the Pippard Lecture Theatre.

The presentation will be followed by a tour of the Cavendish Museum which houses many of the historically important pieces of apparatus which contributed to major discoveries by members of the Laboratory. Exhibits include apparatus used by Maxwell, Thomson, Rutherford, Aston, Cockcroft and Walton. Post Second World War exhibits include the discovery of pulsars, and the structure of the DNA molecule.

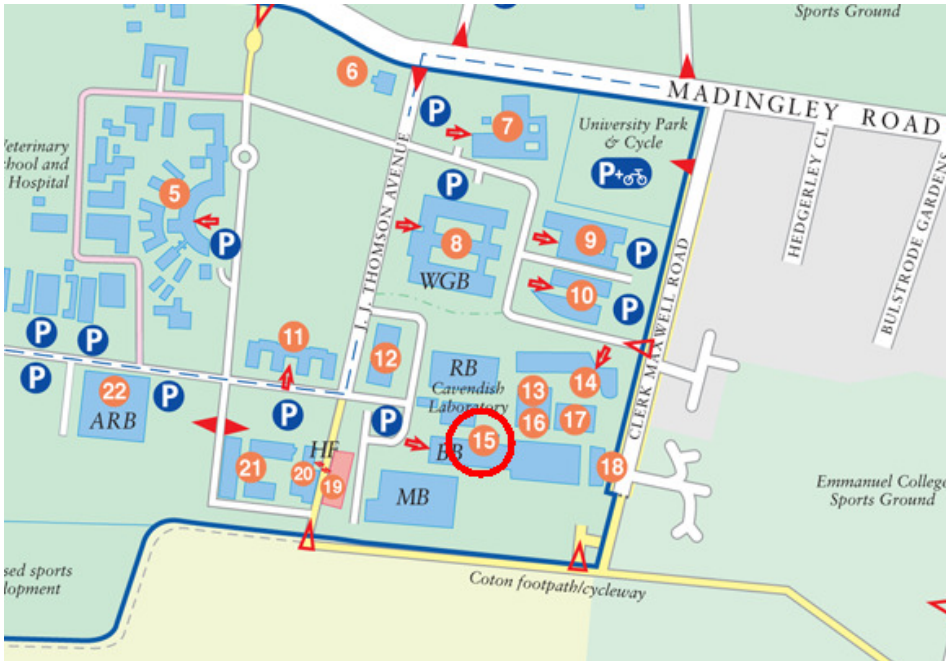
There is also an interesting series of photographs of Cavendish staff and research students from 1897 to the present, one per year. Do you recognise anyone, or indeed, are you there?!

After lunch in the Cavendish Common Room, we will tour a number of the Laboratories to gain an appreciation of the breadth and depth of continuing research at the Cavendish.

## Where and when to meet

The official address is: Cavendish Laboratory, 19 JJ Thomson Avenue, Cambridge CB3 0HE

The site map for the University 'West Cambridge' site is shown below. The main route through the site is JJ Thomson Avenue, entered from Madingley Road.



The building where we will meet is number 15 (ringed), and is pictured at the top of this flyer. (Note: these number are for map references only).



Building 12, strikingly modern, left, is also marked 'Cavendish Laboratory', but this is the 'Physics of Medicine' department and not the building we want. Take the road, left, from JJ Thomson Avenue, indicated by the large blue sign 'Cavendish Laboratory/Visitors Car Park and Reception', between the futuristic cycle park and building 12. Bear right – pass the first building marked "Rutherford": you then get to the building we want, 15 on the map, labelled 'Bragg/Cavendish Laboratory' picture at top of flyer..

Assemble in the Pippard Lecture Theatre foyer between 10:30 and 11:00. Refreshments will be available from 10:30.

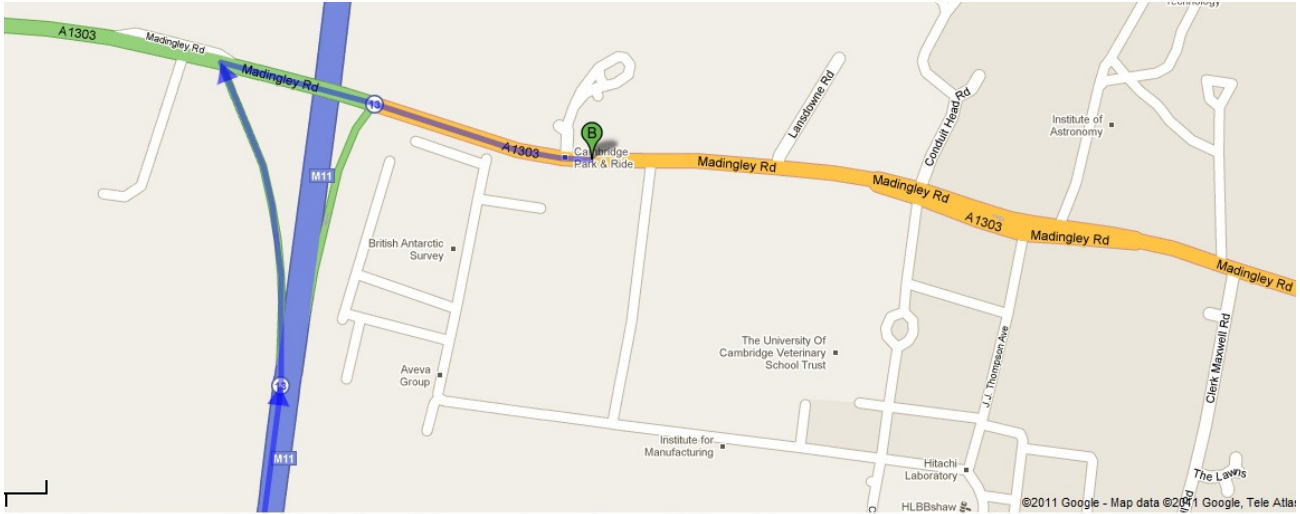


To get to the Pippard Lecture Theatre foyer, facing the Cavendish building as in the picture at the top of this flyer, walk around the right hand side of the building, and you will find an entrance just after the 2 sets of steel barriers. The entrance is shown in the picture, left, just before the cycle rack.

# Getting there

## 1. By Car

From the South, take the M11, exit junction 13, turn right onto Madingley Rd/A1303 (signs for Cambridge), see map below. *JJ Thompson Avenue* is shown towards the lower right.



There is very limited visitor car parking on site, I have been told that this will not be available to us.

There are 2 options:

(a) there is free parking along *Clerk Maxwell Road*, shown in the site map and in the larger scale map, above - I am told it gets full, not surprisingly, but it might be worth a try (0.8 miles from the right turn onto A1303 after the M11 exit).

(b) use the Park&Ride site, (on the left, indicated by the green 'B' icon, 0.3 miles from the right turn onto A1303 after the M11 exit postcode CB3 0EX, tel 01223 321655).

I am told that the P&R site doesn't get full up, so there should be places available. The P&R site is not supposed to be regarded as just a car park – you are supposed to use a bus from the site to get to your destination (and not walk, even though the walk is only about 10 minutes). That's ok, as you can catch the 'Uni4' bus from the P&R site, the first port-of-call being the Cavendish site. The 'Uni4' service leaves the P&R site at 08, 28, 48 minutes past the hour, and the journey time to the Cavendish is just a few minutes.

The bus does not enter the site via JJ Thompson Avenue, so you need to look out for when it turns into this road. Look out for the modern looking building (picture to right of site map) - Cavendish Laboratory, Physics in Medicine. When you see it dead ahead, wait for the bus to turn left (into *JJ Thomson Avenue*), then get off directly in front of the building). This is building 12 on the site map, so follow the instructions in the 'Where and when to meet' section above to get to building 15 where we will meet.

Car parking is free, and so is the bus on production of a bus pass, so don't forget to bring your bus pass, otherwise the cost of the bus will be £1.10.

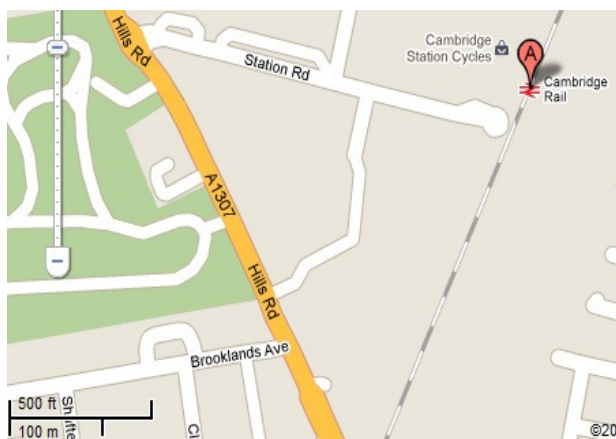
## 2. By Train

There is a fast train service from King's Cross to Cambridge (First Capital Connect). At the time of writing, there appear to be 2 choices: 09.15 arriving at 10.03, and 09.45 arriving 10.31. The first option costs around £20 return with senior railcard (from [www.raileasy.co.uk](http://www.raileasy.co.uk)), and gets you to the Cavendish early for coffee. The second option costs around £14 return, but you have little time for coffee.

Fast return trains from Cambridge to King's Cross are 16:15 arrive 17:06, 16:45 arrive 17:39.

To get from Cambridge station to the Cavendish, received wisdom is to take a taxi. There are plenty queued up outside the station, cost around £9. If several members could share a taxi, then all the better.





Alternatively, you could use the 'Uni4' bus service. The bus stop is in Brooklands Avenue, see map to left. Exit the station from main entrance and go straight on down Station Road, although I couldn't see any road signs. At the end of Station Road, turn left at the lights (you will see a war memorial at the junction), into Hills Road. Carry on and turn right at Brooklands Avenue. The bus stop is on the left hand side, just outside the 'Elmhurst' building. Take the 'Uni4' bus, and alight at JJ Thompson Avenue. Buses leave at 05, 25, 45 minutes past the hour. Note: do not confuse with the 'Citi4' service which also calls at this stop. 'Citi4' buses do not call at the Cavendish. Allow about ½ hour for the transfer.

When you alight from the 'Uni4' bus at the stop in *JJ Thomson Avenue*, walk in the same direction as the bus, past the cycle park with the futuristic roof, and you will then arrive at building 12, the Cavendish Physics of Medicine building. Follow the instruction in the section 'Where and when to meet' above to get to building 15 where we will meet.

## Lunch arrangements

Lunch will be taken at 13:00 in the Cavendish Common Room. Members can select from the menu, which will include hot choices, vegetarian options, and salad. The cost for a two course meal is around £6. Alcoholic drinks are not served.

## Maximum and minimum, size of party: 25

**Cost:** £10:00 to include refreshments on arrival

## Timetable

Time	Details
10:30	Assemble in the Pippard Lecture Theatre foyer for refreshments
11:00	Presentation in Pippard Lecture Theatre
11:45	Tour of the Museum
13:00	Lunch in the Cavendish Common Room, paid separately
14:15	Tour of the Laboratories
15:30	End of visit

## Contacts (before the day)

John Belling on mobile 07986 379935 or email [john.a.belling.secrems@gmail.com](mailto:john.a.belling.secrems@gmail.com)

## Late arrivals on the day – who to contact

John Belling on mobile 07986 379935