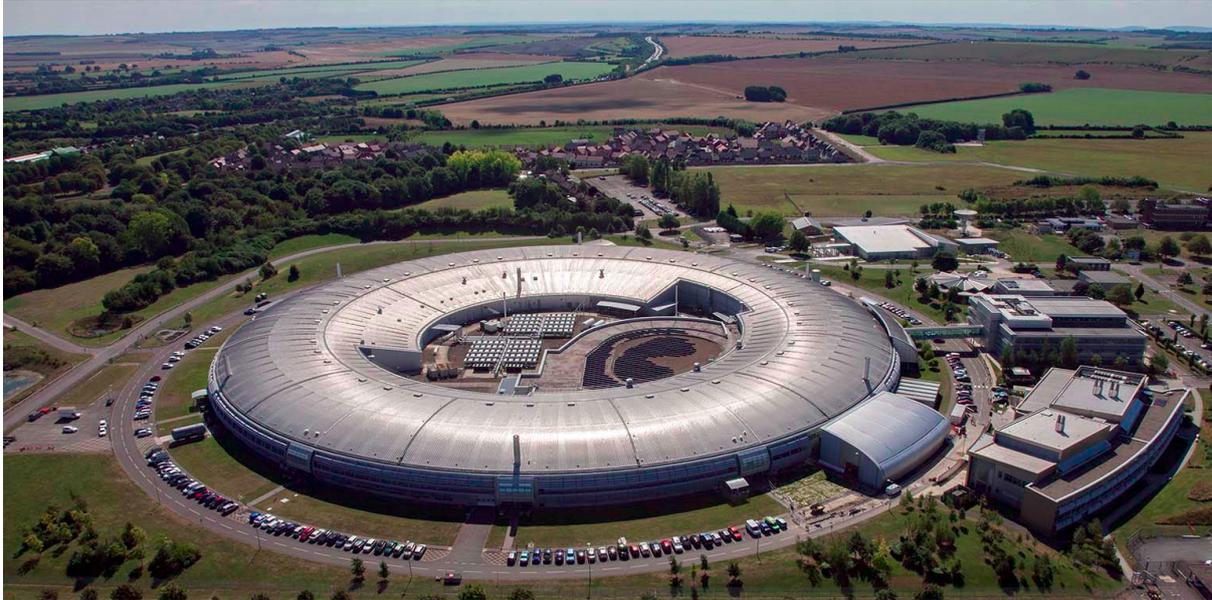


The Diamond-II Upgrade Project

Joint accelerator institutes seminar series – Trinity Term 2021
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Abstract:

Diamond Light Source is the UK's national synchrotron radiation facility, commissioned in 2006 and welcoming its external first users in 2007. The number of operating beamlines has grown steadily over time from the initial complement of 7 up to the present value of 35. This has only been possible by making several modifications to the structure of the storage ring, such as the 'mini-beta' insertions, the 'double-double bend achromat' (DDBA) cell replacement and the 'missing-sextupole' modification.

In parallel with developments at Diamond, there has been a step-change in the design and ultimate performance of storage ring-based light sources worldwide. The latest generation of facilities are based around the multi-bend achromat concept, which are able to produce 1-2 orders of magnitude increase in the photon beam brightness. This was first demonstrated by the MAX-IV light source in Sweden, but was quickly followed by many other new facility and upgrade proposals. Within this context, Diamond is in the process of producing the Technical Design Report for a replacement storage ring that merges the ESRF-EBS design with the Diamond DDBA concept.

This talk will provide an initial introduction to the Diamond facility before moving on to present the Diamond-II upgrade project. The concept and underlying principles of the replacement ring design will be described before concluding with an overview of the technological choices.