

**Nuclear Physics Masterclass**

Located in Cheshire on the Sci-Tech Daresbury campus, the STFC [Daresbury Laboratory](http://www.stfc.ac.uk/1903) is a world-renowned centre of research excellence and the home to the Nuclear Physics Group. The major role of the Nuclear Physics Group is to support and contribute to the UK's Nuclear Physics research programme supported by the STFC

The broad aim of Nuclear Physics research is to study the properties and structure of nuclei, and the mechanisms involved in their creation. This poses questions about the limits of nuclear stability, the fundamental physical processes which governed the formation of light nuclei in the first moments after the Big Bang, and the subsequent synthesis of heavier nuclei within stars.

Nuclear Physics research provides technologies which are transferable to wider applications, benefiting society in a range of areas including medicine, power production and security. Research in this field comprises the design and research and development of detector systems, experimental work which is carried out at specific overseas facilities, data analysis, and a complementary theoretical programme.

The Nuclear Physics masterclass programme will include:

* An introduction to Daresbury Laboratory by Professor John Simpson (Head of Nuclear Physics at Daresbury Laboratory).
* Gamma-rays: Imaging the invisible - the latest research being carried out by the University of Liverpool to revolutionise gamma-ray imaging - Dr Laura Harkness Brennan (University of Liverpool).
* Binding Blocks - a nuclear physics outreach project covering Nuclear fusion, Nuclear fission, Nuclear astrophysics, Nuclear physics in medicine and Exotic nuclei, pupils help build an eight metre long 3D nuclear chart of all isotopes made completely out of lego™ (York University).
* Gamma-ray detection – pupils will be identifying the spectra from several “unknown” source of gamma radiation (Liverpool University).
* Simulation of radiation detection activity - pupils will simulate realistic radioactive source and record the energy deposited in a NaI scintillator and Germanium detector (Daresbury Laboratory).
* The Nuclear energy industry – “The facts behind the fuss” - An engaging lecture by Dr John Roberts (Manchester University)
* The Nuclear Physics Quiz

The day starts at 09:30 and runs until 15:45 – this is a great opportunity for students to talk to real physicists about what they do. .

For further information or booking, please email [Wendy Cotterill](mailto:wendy.cotterill@stfc.ac.uk?subject=Particle%20Physics%20Masterclass%202013), or call on 01925 603 408.

Note to teachers:

* The masterclass is **aimed primarily at sixth form students**, though ***high-achieving year 11*** students may also benefit
* Attendance is limited to a maximum of 80 students per day. These students are split into 4 groups for practical reasons, with a maximum of 20 students in each group