Physics for Specialists

For Teachers of KS5 Physics and GCSE Astronomy

Date: Friday 23rd march 2012 **Location:** National Space Centre, Leicester
Time: 9.30am – 3.30pm **Lunch included**
Cost: £100 + VAT

For more information, or to book a place on this CPD session, please contact Dr Sarah Hill, National Space Academy Project Manager: sarahh@spacecentre.co.uk

Planetary exploration and Earth Observation platforms provide fantastic contexts for teaching A-level physics.

The topic covers an enormous range of activities, from the use of data to monitor changes in the atmosphere to the co-ordination of multinational emergency disaster relief programmes using real-time data from satellites. Many of the techniques used have also been applied to other worlds in the Solar System - and thus given better insights into the geological history of our home planet.

The National Space Academy and European Space Astronomy Centre (ESAC) have developed a range of new activities and innovative teaching approaches that use these topics as contexts for post-16 science and mathematics curriculum areas. Current space scientists from the Universities of Nottingham, Leicester, the Open University and the European Space Agency (ESA) have worked with Advanced Skills Teachers and other outstanding educators to produce a series of intensive, all-day teacher masterclasses and extra resources to help enhance physics teaching.

Curriculum areas covered during the CPD session:

- Gravitational field theory
- Newton's laws and momentum
- Vectors and scalars
- Ballistics theory
- Theory of orbits including Kepler's Laws and multipolar fields
- The EM spectrum
- Atomic excitation and photon emission/absorption
- Wien's Law/Blackbody radiation
- Ideal gas theory and kinetic theory of gases
- Use of exponentials to model pressure drop with altitude in an ideal gas atmosphere (parallels to capacitors/radioactive decay)
- Nuclear excitation and gamma ray/neutron spectroscopy
- Magnetic fields, generation of and charged particle interactions with
- Using data from NASA/ESA's SOHO mission in the classroom

Attendees will also receive access to over 500MB of digital resources to accompany the course and will have the opportunity to see "We are Astronomers", the official 2009 International Year of Astronomy "fulldome" planetarium show produced by the National Space Centre.

Course Tutor

Anu Ojha has been Director of Education and Space Communications at the National Space Centre, Leicester since 2008. Awarded Advanced Skills Teacher (physics/science) status in 2003, he was formerly Assistant Headteacher (Director of Science and Mathematics) at the largest Specialist Science College in the UK as well as a Triple Science Lead Practitioner (Physics) for the Specialist Schools and Academies Trust.

He has presented sessions at NASA conferences at Johnson Space Center (2008-2010) as well as at the 2010 and 2011 ESA (European Space Agency) Teacher Conferences held at ESTEC. Anu also contributed to the UK Space Agency's Space Exploration Review (BNSC 2009), ESA/EU workshops on future exploration strategies (2010) and has worked on ESA projects focused on the SOHO mission and ESA's Virtual Observatory.

In 2010 Anu was selected to be an ESA "space ambassador" for the UK Space Education Office (2010-present) and was also awarded the Sir Arthur Clarke Award for Inspiration by the UK space industry.

Other roles currently include STFC's Science in Society Advisory Panel and the National Centre for Earth Observation's (NCEO) Advisory Group (education and outreach).

For all full-time teachers, bursaries (£200 per participant) are available to cover course and supply/travel costs. These are subject to post-INSET evaluation completion.