NITheP cordially invites you to a seminar by:

**Professor J. D. Hey**  
*School of Chemistry and Physics, University of KwaZulu-Natal*

**Date:** Friday, 26th July 2013  
**Time:** 11h15 – 12h15  
**Venue:** NITheP Seminar room, H-Block, 3rd Floor

**Title:** Probing Galactic H II Regions by Atomic Spectroscopy

**Abstract**

H II nebulae are vast regions of highly ionised, tenuous plasma within spiral galaxies, containing a substantial population of atoms in excited states of high principal quantum number ($n > 100$). These so-called Rydberg atoms, which emit radio recombination lines ($n \sim n + \Delta n \rightarrow n$) in the GHz range, are highly polarisable owing to the large ‘sizes’ of their electron orbitals, and hence extremely susceptible to collisions with ions, which transfer momentum and maintain kinetic equilibrium between charged and neutral species. While radio astronomical spectra have provided valuable data on the H II regions, interpretation of these spectra (the line profiles) requires the use of models incorporating interesting aspects of atomic physics particular to Rydberg atoms.

This presentation will consist of an elementary description of types of H II regions, the atomic processes taking place in such plasmas, and provide some information on the physical basis of models currently employed in the interpretation of the line broadening in spectral series, together with their possible shortcomings.

*Tea/coffee and biscuits will be served at 11h00*