

AstroSurf 2007

'New Astronomical Challenges for Surface Science' Meeting
Heriot Watt University, 13-15 June 2007

The second meeting of the UK AstroSurf Network provided a wide-ranging overview of the challenges facing the surface science community in the area of astrochemistry, as well as discussion of the most recent developments in the field, both observationally and experimentally. Key topics addressed in the lectures and posters included both laboratory results and modelling of dust grain chemistry involving PAHs; discussions on chirality and polarisation; and observations of ices in star-forming regions.

PAHs are being studied by various groups as a potential route to larger organic molecules detected in the ISM. Their aromaticity affords some stability in the gas phase, where interaction with UV radiation followed by internal conversion produces vibrationally excited molecules that could react to form larger organic molecules. Their intermediate size range (between that of single molecules and dust grain surfaces) could allow them to act as catalytic surfaces in the reactions of smaller atoms and molecules (Hornekaer). Recent work at RAL suggests that energy absorbed by PAHs can be transferred to surrounding molecules in the solid phase, at levels high enough to promote desorption into the gas phase (Thrower). This could provide a route to gas phase chemistry for molecules which don't themselves absorb in those regions of the spectrum.

The interaction of molecules with "chiral" surfaces was discussed in terms of basic methyl lactate conformers. There is potential for investigating chemical reactions on handed surfaces, perhaps producing chiral molecules (Kadodwala). New 4GLSs based on FEL technology are being built across Europe. These will be reversible, circularly polarised sources that could potentially be applied to investigation of chirality in basic ISM molecules and possible routes to amino acids (Flavell).

Observation of molecules in interstellar ices provides vital information on the chemical and physical properties of the ice and can be used to deduce the chemistry occurring in the ISM. With higher resolution images from more sensitive telescopes the degree of accuracy of our results improves. Ice mapping will allow us to look at the formation and evolution of clouds and disks (Fraser) while far-IR observations from space will indicate the composition of grains (Swinyard) allowing more accurate chemical models of their surfaces to be developed.

As a chemist joining the field of astrochemistry, this meeting gave me an interesting and informative overview of current topics of interest. The lectures and seminars were engaging and a good length for a two day meeting. I thought that a dedicated poster session may have encouraged more discussion of the research being carried out by the younger members of the community, but I realise that in just two days there was insufficient time for such a session.