

**ESR #1** Experimental studies of the catalytic activity of PAHs in the formation of hydrogen, nitrogen and oxygen bearing species

Host Institute: Institute for Physics and Astronomy, Aarhus University

Host Country: Denmark

Start date: During the period October 1<sup>st</sup> 2016 – September 1<sup>st</sup> 2017

The candidate will be employed at the Institute for Physics and Astronomy at Aarhus University and will be enrolled in the PhD programme at Aarhus University under the supervision of Assoc Prof L. Hornekær.

### **Project description**

The rates of formation of small molecules like H<sub>2</sub>, OH, H<sub>2</sub>O and NH<sub>3</sub> in the interstellar medium can be greatly enhanced through catalytic effects. PAHs are proposed to act as catalysts for the formation of such species and this experimental surface science project will utilize scanning tunnelling microscopy and thermal desorption techniques to investigate their efficiency. You will join the Surface Dynamics Laboratory team and investigate the interactions between atomic species and PAH molecules, obtaining sub-molecular information on the structure of functionalized PAHs on surfaces of interstellar relevance. The project will include secondments to Physikalisches Institut, Westfälische Wilhelms-Universität Münster (Germany) for laser-stimulated desorption experiments, and Hiden Analytical (UK) for insight into industrial research and design processes. You will play an active role in the research group, contributing to other experiments when required and supervising bachelor students' projects. The candidate will be enrolled in the Graduate School of Science and Technology at Aarhus University and will be expected to complete a PhD program which includes completion of local academic training requirements.

**Group description** The Surface Dynamics Group at Aarhus University carries out research in the fields of surface astrophysics and nanoscience with a particular emphasis on the role of carbon based materials. <http://phys.au.dk/forskning/forskningsomraader/condensed-matter-physics/surface-dynamics-group/>. The group has extensive experience in the use of surface science techniques, in particular STM and thermal desorption methods, and works closely with theoreticians.

**Institute description** The Graduate School of Science and Technology (GSST) is the largest graduate school at Aarhus University with almost 800 PhD students enrolled. PhD programmes at GSST are well structured, and participation in PhD courses, visits to international research institutions or universities and dissemination of knowledge are parts of the PhD education. Aarhus is Denmark's second largest city, a true student town, compact and close to the sea.

**Ideal candidate** The successful candidate will have a masters' degree (or equivalent) in physics, chemistry or astronomy. Experimental laboratory experience is required and candidates with experience of ultra-high vacuum techniques will be preferred.

**Working conditions and benefits** The candidate will become an employee of the Dep. Phys and Astron. and receive a competitive monthly gross salary in accordance with the EC Marie Skłodowska-Curie. The contract period will last for 3 years.