

## **2-year postdoctoral fellowship in spectroscopic image analysis**

### **Background**

Soil organic matter (SOM) stores a large part of the Earth's carbon. Yet our understanding of the molecular processes that control the stability and mobility of SOM is limited. This, in turn, limits our ability to predict how SOM will respond to environmental changes. The fate of SOM is influenced by the complex microbial, chemical and physical interactions in soils, which calls for a cross-disciplinary approach to advance this area of science. One area of particular interest is the spatially heterogeneous decomposition of SOM by fungi using hydroxyl radicals and extracellular enzymes.

### **Tasks**

We are seeking to recruit a highly motivated post-doctoral scholar to a cross-disciplinary research environment, with formal placement at the Department of Astronomy and Theoretical Physics, Lund University. Your project will focus on analyzing and modeling the spatially heterogeneous decomposition of soil organic matter by fungi. Spatially resolved FTIR and Raman spectra are acquired by experimental partners from organic substrates after partial degradation by different classes of fungi. You will need to select and combine suitable methods from statistics, machine learning and image analysis in order to construct models that aid the formulation of hypotheses about the underlying biochemical mechanisms governing decomposition of organic matter. Preferably, you may also propose and perform additional experiments. The project will be conducted in close collaboration with microbial ecologists, geochemists, spectroscopists and systems biologists in the research team. The postdoctoral funding is granted for a period of two years.

You will be a member of Dr. Carl Troein's group, co-located with the groups of professors Anders Tunlid and Per Persson at the Department of Biology, as part of the larger multidisciplinary research program "Molecular Interactions Controlling soil Carbon Sequestration – MICCS" (<http://miccs.info/>).

### **Qualifications**

The successful candidate must have the following qualifications:

- PhD in the area of spectroscopy, computational biology, machine learning or related disciplines.
- Experience of analysis of spectroscopic data.
- Ability to conduct research both independently and as a member of a team.
- Fluent in English (written and spoken).
- Excellent communication skills to allow for presentation to specialists as well as to scientists outside the area of research.
- Strong drive towards research publications.

### **Additional desirable skills**

- Experience in multivariate statistics and/or machine learning.
- Experience in programming in Python, Matlab or a similar language.
- Experience in quantitative image analysis.

## **Application**

Please send your application written in English as a single PDF file to Dr. Carl Troein, Department of Astronomy and Theoretical Physics, Lund University, Lund, Sweden; e-mail: [carl.troein@thep.lu.se](mailto:carl.troein@thep.lu.se). The application should contain the following parts:

1. A CV, including date of public PhD thesis defense or equivalent, title of thesis, previous appointments, current position and academic distinctions (max. two pages).
2. A full list of publications.
3. A brief outline of current research (max. one page).
4. Names and contact information of at least 3 professional references.
5. A cover letter where you also outline why you find this cross disciplinary research area interesting, and how you believe you can contribute to the progress in this area of research.

Further information about the postdoctoral fellowship is given by Dr. Carl Troein ([carl.troein@thep.lu.se](mailto:carl.troein@thep.lu.se)).

The closing date for applications is April 5, 2018.