



Postdoc Position

Mathematical modelling and upscaling of rhizosphere control mechanisms



Universität für Bodenkultur Wien
Department für Wald- und Boden-
wissenschaften

A 3-year postdoc position is open at the Institute of Soil Science, Department of Forest and Soil Sciences, BOKU Vienna. It is part of the interdisciplinary project „Mathematics and Rhizotechnology. Mathematical methods for upscaling of rhizosphere control mechanisms“, funded by the WWTF („Wiener Wissenschafts-, Forschungs- und Technologiefonds; see the link “funded projects” at <http://www.wwtf.at/wwtf/>).

Aim of this project, which will start on March 1st, 2008, is to develop a mathematical model that represents the most relevant rhizosphere control mechanisms, applying state of the art mathematical methods to link the processes on a single root scale to a whole root system. The project shall lead to optimised performance of rhizotechnologies, resulting in higher production efficiency, and reduction of both experimental costs and environmental load.

The work of the postdoc, in cooperation with the project partners, will include:

- further development of mechanistic models at the single root scale with emphasis on root exudate-phosphorus interactions
- modelling the root architecture of oil seed rape
- mathematical upscaling of single root processes to a whole root system
- numerical simulations both at the single root and the whole root system scale
- to participate fully in the academic activities of the Institute of Soil Science

Mathematical models will be developed in cooperation with the University of Oxford. This will require the successful applicant to spend 6-12 months at the Mathematical Institute, University of Oxford. Wages are according to the pay scale of FWF (http://www.fwf.ac.at/de/projects/personalkostensaetze_2007.html).

Related experimental investigations performed by a PhD candidate support model development and parameterisation: the experimental approaches include the selection of oil seed rape cultivars with differing exudation pattern, root architecture and root branching structure, determination of phosphorus/exudate interactions and assessment of the effect of exudation and root architecture on plant phosphorus efficiency.

Requirements:

- strong background in modelling and simulation is essential
- to be familiar with ordinary and partial differential equations
- to be able to pursue research as part of an interdisciplinary team and to collaborate with experimentalists
- experience in upscaling methods and/or matched asymptotic expansions is desirable
- programming skills are desirable

Application:

Please email your electronic application including cover letter, CV and list of publications until January 10th, 2008, to one of the email addresses below:

Dr. Andrea Schnepf: phone: (+43)1/47654-3128, email: andrea.schnepf@boku.ac.at

Dr. Sabine Klepsch: phone: (+43)1/47654-3105, email: sabine.klepsch@boku.ac.at

BOKU seeks to increase the percentage of female employees and strongly encourages qualified women to apply.. Applicants are not entitled to reimbursement of travel and subsistence expenses incurred by the selection and interviewing procedure.