

## PhD Scholarships at DTU Space in the research area “Geomagnetism”

Applications are invited for two 3-year PhD positions in the Geomagnetism group of DTU Space, the National Space Institute of Denmark. The group is heavily involved in exploring Earth’s magnetic field from space by analyzing magnetic field observations from present satellite missions like Ørsted and CHAMP, and in the preparation of the *Swarm* mission, a constellation of three satellites to be launched in 2010.

The topic of the first position is

### **Determination of Earth’s magnetic field with scalar-, vector- and gradient magnetic data – analysis of future mission scenarios.**

The *Swarm* mission will provide a mapping of the Earth’s magnetic field which is much superior to what is possible with the present satellites. However, looking towards the time frame after *Swarm*, there is a whole spectrum of obvious directions for exploring the geomagnetic field from space. The goal of this PhD project is to investigate which magnetic satellite measurements are optimal for investigating the different contributions to Earth’s magnetic field. Is it better to have many simultaneous flying satellites that only measure the strength of the magnetic field, a few satellites measuring the magnetic field strength and its direction, or one single satellite measuring both the magnetic field vector and its gradient? The characteristics of different mission scenarios regarding their ability to determine time changes of the core field and small-scale structure of the lithospheric field shall be investigated using synthetic magnetic field data.

The second position will be about

### **Fast methods for determination of Earth’s crustal magnetic field using *Swarm* satellite data.**

Outside their respective sources, both the Earth’s magnetic and gravity field are potential fields, and similar tools may be used to study these. There are, however, also important differences between the magnetic and the gravity field, for instance due to electric currents in the Earth’s environment which result in rapid time-changes of the magnetic field. The goal of this PhD study is to investigate to what extent methods developed for gravity field studies (for instance in the context of the GOCE satellite mission) can be adapted to investigate the magnetic field. Of special interest are “quick-look” methods for the mapping of small-scale structures of the Earth’s crustal field from *Swarm* magnetic field measurements. The project will be carried out in cooperation with the space geodesy group at TU München.

Candidates should have a master degree in geophysics, physics, applied mathematics or engineering, or equivalent academic qualifications. Good programming skills (preferably Matlab and/or Fortran) are required.

The scholarships for the PhD degree are subject to academic approval, and the candidates will be enrolled in the Research School “Space Science and Technology” ([www.space-phd.dk](http://www.space-phd.dk)). Information about the general requirements for enrolment and the general planning of the scholarship studies is included in the general rules at DTU, which may be obtained via [http://www.dtu.dk/English/education/Phd\\_Education.aspx](http://www.dtu.dk/English/education/Phd_Education.aspx)

The starting date is negotiable but a quick start is preferred. The salary and further terms of employment (3 years) are consistent with the general terms for PhD students at DTU. Annual salary is approximately 40,000 EUR before tax, including pension/holiday pay.

Further information can be obtained from senior scientist Nils Olsen, phone: + 45 3532 0506, e-mail: [nio@space.dtu.dk](mailto:nio@space.dtu.dk)

All candidates irrespective of age, gender, race, religion or ethnic background are encouraged to apply.

Applications must include a complete curriculum vitae and documentation of a completed M.Sc. or M.Eng. degree and must be sent to:

DTU-Space  
att. Simon Ekholm  
Juliane Maries Vej 30  
DK-2100 Copenhagen Oe

Applications must be received no later than **15. April 2008 at 12.00 noon.**

