

## **Particular for position as Associate Professor of Physics at Norwegian University of Life Sciences**

UMB is recognised as a leading international centre of knowledge, focused on higher education and research within environmental and biosciences. Together with other research institutes established at Ås, UMB provides state-of-the-art knowledge based on a broad range of disciplines. A broad range of study programmes are offered at the Bachelor, Master and PhD level. In total, UMB has some 3100 students of which about 370 are PhD students. There are many different nationalities at UMB; the international students make up over 10% of all students at the University. Of the 1050 University staff, more than half hold scientific positions. UMB is located 35 km south of Oslo. See [www.umb.no](http://www.umb.no).

### **Associate Professor of Physics (ref. no 2009/1421)**

An associate professor position in physics in the field of biophysics is available at the Department of Mathematical Sciences and Technology at the Norwegian University of Life Sciences.

The Department has approximately 100 employees, 50 PhD students and 600 students enrolled in Bachelor and Master Programmes. The position is based in the Section for Mathematical Sciences which consisted of 35 persons of which 13 are academic staff.

The Section's main research areas are currently:

- Biophysics where the main activities are in (1) imaging, pattern recognition and image analysis, (2) computational biology with emphasis on neuroscience and cellular systems, and (3) artificial photosynthesis
- Energy physics with emphasis on renewable energy, bioenergy, solar cells and artificial photosynthesis
- Micrometeorology and local climate changes
- Theoretical hydrodynamics with emphasis on waves and flow in porous media

The Section has several research laboratories including the Laboratory for Biological Physics, the Visualisation Laboratory, the Bioenergy Laboratory and the Field Station for Agroclimatic Studies (FAGKLIM). In addition, the Section has a demonstration platform for renewable energy and several student laboratories used in laboratory courses. See <http://www.umb.no/?viewID=1350> for information.

The Section administers the 5 year MSc study programme – Environmental Physics and Renewable Energy and Bachelor and MSc programmes in physics, mathematics and informatics. In addition, the Section offers introductory physics, mathematics and computer sciences courses for many of the UMB study programmes given outside the Department.

The course portfolio in physics is as follows:

- FYS100 Physics and environment, 10

credits

- FYS110 Statics, 5 credits
- FYS101 Mechanics, 10 credits
- FYS102 Thermal physics and electromagnetism, 10 credits
- FYS103 Measurement techniques, optics and sensors, 5 credits
- FYS145 Quantum physics, 10 credits
- FYS155 Laboratory course in physics, 5 credits
- FYS160 Boundary layer meteorology, 5 credits
- FYS161 Meteorology and climate, 5 credits
- FYS200 Classical physics, 10 credits
- FYS210 Hydrodynamics, 10 credits
- FYS231 Electronics and basic electrical engineering, 10 credits
- FYS241 Environmental physics, 10 credits
- FYS250 Engineering physics, 10 credits
- FYS271 Energy physics and energy conversion, 10 credits
- FYS371 Energy technology, 10 credits
- FYS372 Solar cell technology, 5 credits
- FYS375 Energy technology, lab, 5 credits
- FYS381 Biological physics, 10 credits
- FYS385 Project in biological physics, 5 credits
- FYS386 Mathematical neuroscience, 5 credits

### **The position**

The primary duties of the position are in research and in teaching and dissemination. Further development of the physics course portfolio, the physics MSc and Bachelor study programmes as well as initiation of new courses are considered part of the position. Supervision of MSc and PhD students is also required. We seek a candidate who has good qualifications in general physics and research and supervision experience in biophysics. Experience and interest in experimental physics, metrology, or related subjects is highly desirable. A good record of publishing in peer-reviewed journals is expected. Experience in initiating and participating in research projects as well as writing research proposals is a strength. The successful candidate is expected to strengthen, complement and make an active contribution to our current research interests and to initiate and develop new research programmes.

The successful applicant will participate in teaching general physics at the undergraduate level (i.e. 100 and 200 physics courses, see above) and specialised courses at the MSc and PhD level. The candidate is expected to participate in course revisions and initiation of new courses. This will provide the candidate with ample opportunity to use her/his background to strengthen the course portfolio. Proven experience in teaching in higher education is desirable. If the successful candidate does not have formal qualifications in pedagogics, he/she is obliged to take a course in university pedagogics within 2 years. A successful candidate who does not speak Norwegian, Swedish or Danish is obliged to learn Norwegian within 2 years.

Further information on the course portofolio can be found on:

Note that the position will also include administrative duties according to current regulations.

In assessing the applicants, the main emphasis will be placed on the submitted scientific publications. Research management and participation in research projects will also be assessed if sufficient documentation of such activities is presented. Weight will also be ascribed to documented pedagogical qualifications, outreach activities, the ability to create a good working environment and expected potential. Good interpersonal, organisational and communications skills are essential.

### **Research in biophysics**

Currently, the main activities in biophysics are:

- **Imaging, pattern recognition and image analysis with applications in the life and environmental sciences.**

Several projects deal with quantifying plant stress using imaging techniques such as infrared imaging, multispectral imaging and digital microscopy. Other projects focus on texture analysis of images acquired from the food sciences and structural engineering. Applications of different image analysis techniques such as multispectral statistical image analysis, image texture analysis and particle image velocimetry (PIV) are of great interest. New methods for multivariate image analysis, image feature detection, characterization and classification are also being developed and tested. Research is conducted at the Biological Physics and Visualisation Laboratories and in collaboration with national and international partners. The laboratories are equipped with several digital cameras such as infrared cameras, a multispectral camera, high speed camera, videomicroscope etc.

- **Computational neuroscience and neurophysics**

Methods from theoretical physics, mathematics and computer science are used to understand properties of nerve cells and nerve cell networks. The group collaborates closely with national and international experimental groups. In addition to development of models of signal processing in the nervous system, the group also works with the development of physics based methods for interpretation of measurements used to understand the brain. The national supercomputing facilities are used in computer simulations.

- **Artificial photosynthesis as utilized in dye photosensitized electrochemical solar cells.**

Third generation solar cell technologies can be identified by increased energy conversion efficiencies compared to conventional 1st and 2nd generation solid state technologies based on bulk wafers or thin films. Of these, dye photosensitisation of chemically stable semiconducting substrates used in photoelectrochemical solar cells may be closest to industrialisation. Groups at UMB are involved in several research topics related to dye sensitized solar cell technology (DSSC). At IMT the focus is on fundamental studies of characteristics of the individual processes involved in the conversion of photons to electrical energy. The methods used involve advanced spectroscopy based on electrochemical, photochemical, photophysical and physical techniques.

### **Application procedure**

The application is to be sent electronically at this link:

Application deadline: 4<sup>th</sup> January 2010

Please include the following in the application:

- Application letter, CV, full publication list, copies of degree certificates and transcripts of academic records (all certified) and a portfolio containing documentation of teaching experience, funding raising, research plans and other qualifications the applicant wants to have considered.
- Three copies of up to 10 publications judged as the most relevant for the position and important in the applicant's production. If it is difficult to judge the applicant's contribution for publications with multiple authors, a short description of the applicant's contribution must be included.

Printed material which cannot be sent electronically should be sent by regular mail to Norwegian University of Life Sciences, Department of Mathematical Sciences and Technology P.O.Box 5003, N-1432 Ås, Norway, within xxxx, 2009. Reference no: 2009/1421.

According to personnel policy objectives that the staff shall reflect the composition of the population in general, both with respect to gender and cultural diversity, women and persons with a minority ethnic background in particular are encouraged to apply.

UMB aims to recruit more females to science. If two or more applicants are considered to be equally qualified for the position, and at least one of them is a female, the female will be employed.

A successful candidate who has full professorship competence can apply to become promoted to full professor.

The annual salary for the position ranges from NOK 438 700 – 518 200 (Norwegian government salary scale 57- 66) depending on qualifications. A compulsory contribution of 2 % is made to the Norwegian State Pension Fund.

For further information please contact, Head of Department Professor Vidar Thue-Hansen (phone + 47 6496 5411, e-mail [vidar.thue-hansen@umb.no](mailto:vidar.thue-hansen@umb.no)) and Cecilia Futsaether (phone +47 64 96 54 36, e-mail [cecilia.futsaether@umb.no](mailto:cecilia.futsaether@umb.no)).