

**Jobbnorge-ID:** 102111

**Søknadsfrist:** Avsluttet

**Nettside:**

**Omfang:**

**Varighet:**

## PhD grant in medical ultrasound imaging technology

**Project title:** Three-dimensional ultrasound vector-flow imaging for improved understanding and diagnosis of cardiac disease.

Cardiovascular disease is currently the leading cause of death in the Western world, and research resulting in new knowledge that may help detect and prevent such disease is considered of high value. One of the most important tools for the diagnosis of cardiovascular disease is medical ultrasound imaging. Our main goal is to develop a new ultrasound imaging modality capable of resolving three-dimensional (3D) blood flow velocities in the heart during patient examinations. That is, measuring all three components of the blood velocity vector, where current techniques are based on a limited one-dimensional measurement. Our clinical hypothesis is that three-dimensional blood vector-flow patterns contain information useful for the diagnosis of cardiac disease, information that is currently not available during bedside diagnosis. This is considered a challenging task that will involve development of next-generation ultrasound imaging technology. This technology will be used to study the complex relationship between cardiac blood flow patterns and cardiac disease.

### The PhD project will involve:

1. Technical research and development of real-time 3D ultrasound vector-flow imaging for cardiac applications.
2. Basic research to uncover the detailed relation between 3D flow fields and cardiac disease based on advanced biomechanical and small animal models.
3. Patient feasibility studies and method validation in cardiology towards 4D phase-contrast MRI.

The outcome of this project will be basic science in form of new pathophysiological knowledge, technological innovation in form of a new ultrasound imaging modality, and new diagnostic information to be used in the future clinic.

The period of employment for the PhD position is three years. The position of PhD candidate has the objective of taking organized academic training and the completion of the doctoral degree. Admission to a doctoral degree programme is a requirement for employment as a PhD candidate. During the period of employment, three years are to be devoted to research training, including a total of 30 credits from NTNU's PhD courses. For regulations concerning the PhD-degree at NTNU, please see: [http://www.ntnu.no/studieavd/dok/PhD\\_regulations.pdf](http://www.ntnu.no/studieavd/dok/PhD_regulations.pdf)

### Requirements of applicant:

- Engineering background and education corresponding to an international master's degree, with academic merits meeting NTNU's admission criteria to the PhD program (average grade corresponding to B or higher).
- Programming skills in Matlab and C/C++.
- Strong educational background in mathematics, physics, and signal processing.

### Emphasis will also be placed on:

- Prior experience in (medical) ultrasound imaging.
- Applicants should have very good English presentation skills, both oral and written.
- It is important that applicants have good communication skills, and are motivated to work in a multidisciplinary environment.
- The applicant's motivation for the position is highly important.

Students who will complete their master's degree by summer 2013 are also encouraged to apply.

NTNU is an equal opportunity employer and welcomes applicants from both EU/EEA and non-EU countries. The university is strongly committed to diversity within its community and welcomes applications from members of ethnic minorities.

Chosen applicants will be invited to undergo an interview.

Depending on qualifications and academic background, PhD candidates at the Faculty of Medicine will be remunerated at wage code 1017 - levels 50-62 on the Norwegian State salary scale, with gross salary from NOK 420 800 - NOK 518 200 a year, of which 2% is deducted for the Norwegian Public Service Pension Fund. Normal wage level is 50-58, NOK 420 800 - NOK 481 600. A yearly amount for operating costs will be added.

The appointment will be made in accordance with current regulations and supplementary rules with guidelines for employment as PhD candidate appointments at universities and university colleges.

### How to apply:

Applicants are asked to apply via this page ([jobbnorge.no](http://jobbnorge.no)). The application should contain the following attachments:

- Applicants' CV (including list of publications, relevant former positions and references) and copy of relevant transcripts and diplomas.
- Short statement on the applicant's personal qualifications and motivation for the position.
- Short statement from a former supervisor/tutor/teacher.
- Other relevant attachments.

**Deadline for applications: 30. April 2014.**

For further information about the position, please contact:

Associate Professor Lasse Løvstakken, phone (+47) 913 47 206, e-mail: [lasse.lovstakken@ntnu.no](mailto:lasse.lovstakken@ntnu.no) .

For information concerning the application process, please contact  
HR-consultant Gøril Madsø Halvorsen, [goril.m.halvorsen@ntnu.no](mailto:goril.m.halvorsen@ntnu.no)

## **Tilleggsinformasjon**

**Arbeidssted:**