



up to two PhD positions within time lapse monitoring.

About the position

The Department of Electronic Systems has vacancy for up to two PhD positions within time lapse monitoring.

PhD fellowship(s) in time lapse monitoring are available at the Department of Electronic Systems at NTNU. The successful candidate will be offered up to 4 years position with required duties. The work place will be Trondheim.

The position reports to Head of department

Main duties and responsibilities

Job description

The first PhD position is part of the project "Geophysics and Applied Mathematics for Exploration and Safe Production", funded by The Research Council of Norway. The main topics of the project are methods for data assimilation and efficient monitoring in geosciences applications. The candidate is expected to conduct research in one of the areas of the project under the supervision of a permanent member of the acoustics group participating in the project.

The second PhD position is part of the project "Enabling time-lapse 3D CSEM for reservoir management", which is lead by EMGS and sponsored by the Research Council of Norway. EMGS is a Trondheim based company providing acquisition, processing and imaging services for marine electromagnetic data. The position deals with the use of repeated geophysical data to detect and use changes during hydrocarbon production or during underground storage of CO₂.

PhD 1: In recent years several of the major hydrocarbon fields offshore Norway have been equipped with permanent seismic sensors that are trenced into the seabed. Repeated seismic surveys are shot over these receiver arrays typically two times per year, in order to detect and monitor reservoir changes related to production. This new type of acquisition makes it possible to develop new methods and algorithms to improve this 4D mapping process. The use of advanced mathematical inversion algorithms and exploiting long offset data is one such example. Another example is to couple typical production effects (such as saturation changes, pressure changes or compaction) to observed changes in the seismic data. The aim is to test such couplings at different levels: fully integrated in a mathematical inversion procedure, or a more stepwise and simplified manner requiring less computational cost. This position requires a good knowledge in geophysics and/or mathematics/physics.

PhD 2: In this project the geophysical method in focus is the use of controlled source electromagnetic (CSEM) data. In a CSEM survey, a powerful electric source antenna is towed behind a vessel and the electromagnetic responses are recorded by seabed nodes. While time-lapse seismic monitoring (4D seismic) has been developed into an established tool for reservoir management, limited R&D has been devoted to time-lapse electromagnetics so far. We suggest to embark on this problem and analyze the acquisition system, data processing and imaging methods to identify key bottlenecks in the challenging task of bringing this monitoring technology a major step forward. The project is motivated by recent improvements in acquisition hardware and real data results that show significant potential for developing time-lapse electromagnetics for reservoir management. The PhD student will work in close collaboration with the R&D group in EMGS in addition to the host department (IES) at NTNU. The research will benefit from the expertise and leading EM software developed at EMGS. It will also be possible to spend some time at OMV office in Stavanger. This position requires a good knowledge in mathematics/physics.

Qualification requirements

PhD candidate:

The PhD-position's main objective is to qualify for work in research positions. The qualification requirement is completion of a master's degree or second degree (equivalent to 120 credits) with a strong academic background in geophysics, underwater acoustics, signal theory, physics, mathematics or equivalent education with a grade of B or better in terms of [NTNU's grading scale](http://www.ntnu.edu/ie/research/phd). Please see: <http://www.ntnu.edu/ie/research/phd> Applicants with no letter grades from previous studies must have an equally good academic foundation. Applicants who are unable to meet these criteria may be considered only if they can document that they are particularly suitable candidates for education leading to a PhD degree.

MSc students who expect to complete their master's degree studies by summer 2019 are also encouraged to apply. Employment will then be postponed until the master's degree is finished.

The appointment is to be made in accordance with the regulations in force concerning State Employees and Civil Servants and [national guidelines for appointment as PhD, postdoctor and research assistant](#)

NTNU is committed to following evaluation criteria for research quality according to [The San Francisco Declaration on Research Assessment - DORA](#).

Personal characteristics

- Curious, innovative person
- Scientific communication skills
- Ability to put thoughts into written material

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal suitability, in terms of the qualification requirements specified in the advertisement

We offer

- exciting and stimulating tasks in a strong international academic environment
- an open and [inclusive work environment](#) with dedicated colleagues
- favourable terms in the [Norwegian Public Service Pension Fund](#)
- [employee benefits](#)

Salary and conditions

PhD candidates are remunerated in code 1017, and are normally remunerated at gross from NOK 479 600 before tax per year. From the salary, 2 % is deducted as a contribution to the Norwegian Public Service Pension Fund.

The period of employment is up to 4 years with required duties. Appointment to a PhD position requires admission to the PhD programme in Mathematical Sciences; please see <http://www.ntnu.edu/ie/research/phd> for information about the PhD programme at NTNU.

As a PhD candidate, you undertake to participate in an organized PhD programme during the employment period. A condition of appointment is that you are in fact qualified for admission to the PhD programme within three months.

The engagement is to be made in accordance with the regulations in force concerning State Employees and Civil Servants, and the acts relating to Control of the Export of Strategic Goods, Services and Technology. Candidates who by assessment of the application and attachment are seen to conflict with the criterias in the latter law will be prohibited from recruitment to NTNU. After the appointment you must assume that there may be changes in the area of work.

General information

A good work environment is characterized by diversity. We encourage qualified candidates to apply, regardless of their gender, functional capacity or cultural background. Under the Freedom of Information Act (offentleglova), information about the applicant may be made public even if the applicant has requested not to have their name entered on the list of applicants.

Questions about the positions can be directed to Martin Landrø, phone number +47 73594973, e-mail martin.landro@ntnu.no

About the application:

- The application must include the following:
- CV which includes information about education background and work experience.
- Certified copies of relevant transcripts and diplomas. Candidates from universities outside Norway are kindly requested to send a Diploma Supplement or similar documentation, which describes in detail the program of study, the grading system, and the rights to further studies associated with the degree obtained.
- Contact information for two references.
- Documentation of fluency in the English language.

Publications and other academic works that the applicant would like to be considered in the evaluation must accompany the application. Joint works will be considered. If it is difficult to identify the individual applicant's contribution to joint works, the applicant must include a brief description of his or her contribution.

Please submit your application electronically via jobbno.no with your CV, diplomas and certificates. Applicants invited for interview must include certified copies of transcripts and reference letters. Please refer to the application number 2019/18905 when applying.

Application deadline: 15.09.2019

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The Norwegian University of Science and Technology (NTNU) creates knowledge for a better world and solutions that can change everyday life.

Department of Electronic Systems

The digitalization of Norway is impossible without electronic systems. We are Norway's leading academic environment in this field, and contribute with our expertise in areas ranging from nanoelectronics, phototonics, signal processing, radio technology and acoustics to satellite technology and autonomous systems. Knowledge of electronic systems is also vital for addressing important challenges in transport, energy, the environment, and health. [The Department of Electronic Systems](#) is one of seven departments in the [Faculty of Information Technology and Electrical Engineering](#).

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