

Jobbnorge ID: 256028
Deadline: 2/26/2024
Website: <http://www.ntnu.no>
Scope: Fulltime
Duration: Temporary

The Department of Electric Energy has a vacancy for a

PhD in Characterization of Electric Insulation Systems under Power Electronic Converter Stresses

This is NTNU

NTNU is a broad-based university with a technical-scientific profile and a focus in professional education. The university is located in three cities with headquarters in Trondheim.

At NTNU, 9,000 employees and 43,000 students work to create knowledge for a better world.

You will find more information about working at NTNU and the application process [here](#).

Video: <https://youtu.be/Xt-yHCN5QS0>

About the job

For a position as a PhD Candidate, the goal is a completed doctoral education up to an obtained doctoral degree.

[The Department of Electric Energy](#) (IEL) at NTNU has a vacancy for a full-time 100% position as a Ph.D. candidate within the field of measurement and modeling of electric field stresses in non-linear materials under power electronics converter stresses.

During the last decades power electronic converters (PECs) have been introduced to control and transform electric power - and permeate society for numerous applications: zero-emission transport, renewable energy, and transmission. The PEC is a key technology to succeed with the electrification of society and reach the climate goals set out by the EU and UN. PECs function as on/off switches, resulting in sharp-edged square wave voltages with a high repetition rate. These sharp voltage flanks introduce different stress distributions internally in components and are challenging to model and predict. An important part of insulation systems in high voltage components are materials with non-linear electric properties used to reduce stresses in regions with high electric fields, such as cable terminations and end windings of rotating machines. These materials are mainly designed for operation at 50 Hz AC and impose a risk of premature failure when operated with PECs.

The work of this project will be associated with the project SwOP (Impact of switched voltage waveforms on power components and grids), which is a collaborative project involving NTNU, SINTEF, and several national and international industry partners. The prospective candidate will be part of a project team that works in close collaboration with SINTEF and industry partners. The PhD Candidate will be employed at NTNU, and the workplace will be in Trondheim, in connection with this research project.

The main supervisor will be Professor Kaveh Niayesh (NTNU) and the co-supervisor will be Dr. Espen Eberg (SINTEF Energy Research).

Your immediate leader is the Head of Department.

Duties of the position

- The candidate will in connection with the SwOP project develop methods to measure, characterize, and predict the increased stresses and accelerated degradation of power components exposed to fast PECs.
- The candidate will focus on novel experimental characterization methods and modeling of non-linear materials under PEC stresses. This will contribute to more reliable components and grids operated by PECs and thus to the electrification of society.
- Disseminate scientific findings via conference presentations and journal publications.
- Complete academic training consisting of coursework corresponding to a minimum of 30 ECTS.

Required selection criteria

- You must have a master's degree within Electric Power Engineering, Physics, Material Science, or Electrical Engineering.
- Your education must correspond to a five-year Norwegian degree program, where 120 credits are obtained at the master's level.
- You must have a strong academic background from your previous studies and an average grade from the master's degree program, or equivalent education, which is equal to B or better compared with NTNU's grading scale. If you do not have letter grades from previous

studies, you must have an equally good academic basis. If you have a weaker grade background, you may be assessed if you can document that you are particularly suitable for a PhD education.

- You must meet the requirements for admission to the [faculty's doctoral program](#).
- Good written and oral English language skills. Applicants from non-English speaking countries outside EU/EEA/Switzerland must provide preliminary documentation of English language proficiency, in terms of an approved test. The following tests can be used: TOEFL, IELTS, and Cambridge Certificate in Advanced English (CAE) or Cambridge Certificate of Proficiency in English (CPE). Minimum scores are:
 - TOEFL: 600 (paper-based test), 92 (Internet-based test)
 - IELTS: 6.5, with no section lower than 5.5 (only Academic IELTS test accepted)
 - CAE/CPE: grade B or A

Further assessment of both written and oral English language skills, and the ability to communicate fluently, will be conducted in the continued selection process and during any interviews for the shortlisted applicants.

The appointment is to be made in accordance with [Regulations on terms of employment for positions such as postdoctoral fellow, Ph.D. candidate, research assistant, and specialist candidate](#) and [Regulations concerning the degrees of Philosophiae Doctor \(PhD\) and Philosophiae Doctor \(PhD\) in artistic research national guidelines for appointment as PhD, post doctor and research assistant](#).

Preferred selection criteria

- Work and/or research experience in high voltage engineering
- Experience with running and building lab set ups could be beneficial.

Personal characteristics

- Inquisitive, self-motivated, and self-driven with a strong ability to work both independently, and in cooperation with others when required.
- Communicates information with clarity and ease, both orally and in writing.
- Structured, targeted and solution-oriented.
- Creativity and innovation in research.
- Scientific mindset.

Emphasis will be placed on personal and interpersonal qualities.

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

As a PhD candidate (code 1017) you are normally paid from gross NOK 532 200 per annum before tax, depending on qualifications and seniority. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.

The period of employment is three years, with the possibility of a fourth year.

The option of 4-year employment would imply 1 year of duties as a teaching assistant for the department and may be offered to a candidate with clear motivation and ability for such work if the department sees the need. This will be clarified during and after any interview.

Appointment to a Ph.D. position requires that you are admitted to the Ph.D. programme in [Electric Power Engineering](#) within three months of employment and that you participate in an organized Ph.D. programme during the employment period.

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 criteria 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.

The position is subject to external funding.

It is a prerequisite you can be present physically at and accessible to the institution at campus Trondheim daily.

About the application

The application and supporting documentation to be used as the basis for the assessment must be in English.

Publications and other scientific work must be attached to the application. Please note that your application will be considered based solely on information submitted by the application deadline. You must therefore ensure that your application clearly demonstrates how your skills and experience fulfil the criteria specified above.

The application must include:

- A cover letter where the applicant describes personal motivation and relevance with respect to the requirements of this advertisement.
- CV and certificates

- Transcripts and diplomas for bachelor's and master's degrees. If you have not completed the master's degree, you must submit a confirmation that the master's thesis has been submitted.
- A copy of the master's thesis. If you recently have submitted your master's thesis, you can attach a draft of the thesis. Documentation of a completed master's degree must be presented before taking up the position.
- A draft research proposal (2-3 pages) for the PhD study, where the candidate presents her/his own ideas for the PhD-work and how they can be applied, based on the project description given in this advertisement. This proposal will be neither final nor binding for the project.
- Applicants from universities outside Norway are kindly requested to send a diploma supplement or a similar document, which describes in detail the study programme and grading system.
- English language proficiency documentation
- Name and contact information of three references.
- Relevant publications or research work.

Incomplete applications will not be assessed.

If all, or parts, of your education has been taken abroad, we also ask you to attach documentation of the scope and quality of your entire education, both bachelor's and master's education, in addition to other higher education. Description of the documentation required can be found [here](#). If you already have a statement from NOKUT, please attach this as well.

We will take joint work into account. If it is difficult to identify your efforts in the joint work, you must enclose a short description of your participation.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal and interpersonal qualities. Motivation, ambitions, and potential will also count in the assessment of the candidates.

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

General information

[Working at NTNU](#)

NTNU believes that inclusion and diversity are our strengths. We want to recruit people with different competencies, educational backgrounds, life experiences, and perspectives to contribute to solving our social responsibilities within education and research. We will facilitate for our employees' needs.

NTNU is working actively to increase the number of women employed in scientific positions and has a number of resources to [promote equality](#).

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the innovation capital of Norway with a population of 200,000. The Norwegian welfare state, including healthcare, schools, kindergartens and overall equality, is probably the best of its kind in the world. Professional subsidized day-care for children is easily available. Furthermore, Trondheim offers great opportunities for education (including international schools) and possibilities to enjoy nature, culture and family life and has low crime rates and clean air quality.

As an employee at NTNU, you must at all times adhere to the changes that the development in the subject entails and the organizational changes that are adopted.

A public list of applicants with name, age, job title and municipality of residence is prepared after the application deadline. If you want to reserve yourself from entry on the public applicant list, this must be justified. Assessment will be made in accordance with [current legislation](#). You will be notified if the reservation is not accepted.

If you have any questions about the position, please contact Professor [Kaveh Niayesh](#), e-mail: kaveh.niayesh@ntnu.no, and/or Dr. [Espen Eberg](#), e-mail: espen.eberg@sintef.no. If you have any questions about the recruitment process, please contact HR consultant [Sven Robert Stora](#), e-mail: sven.r.stora@ntnu.no

If you think this looks interesting and in line with your qualifications, please submit your application electronically via jobbnorge.no with your CV, diplomas and certificates attached. Applications submitted elsewhere will not be considered. Upon request, you must be able to obtain certified copies of your documentation.

Application deadline: 26.02.2024

NTNU - knowledge for a better world

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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 Electric Energy

The Department of Electric Energy is one of the seven departments at the Faculty of Information Technology and Electrical Engineering. Our department is Norway's leading in the field, and our vision is to be at the centre of the digital, green shift. We have excellent collaboration with business and industry as well as other universities and research organizations internationally. This gives us outstanding opportunities for interdisciplinary research with high relevance for the society, addressing industrial needs and global challenges.

Additional information

Place of service:

Elektrobygget O. S. Bragstads plass 2E, E-blokk 3. etasje 7034 Trondheim (Trondheim Municipality)