Jobbnorge ID: 291522
Deadline: 1/25/2026
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Fixed Term

The Department of Materials Science and Engineering has a vacancy for a

PhD Candidate in Modelling of Electrochemical Gas Evolution in Electrolysis Processes

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 position

The Department of Materials Science and Engineering (IMA) at the Natural Science Faculty, has a vacancy for a position as PhD candidate related to modelling of electrode processes relevant for production of aluminium by electrolysis (Hall-Héroult process). The PhD project is affiliated to the National Research Center for Zero Emissions Metal Production (FME ZeMe). The main aim of this PhD project is to develop mathematical models relevant for processes at the anode of aluminium electrolysis cells, with emphasis on evolution of bubbles, including the so-called “anode effect”. The aim of the project is to obtain improved understanding of these phenomena, and how they affect the performance and operation of cells, using advanced mathematical modelling in the open-source simulation platform OpenFOAM.

The main supervisor of the candidate will be Prof. Ann Mari Svensson (IMA), NTNU. Co-supervisors will be Senior researcher Kristian E. Einarsrud (SINTEF) and Researcher Kurian J. Vachaparambil (SINTEF). The PhD candidate will be integrated in the research activities conducted within FME ZeMe, involving a group of PhD candidates, as well as professionals both from industry and academia.

Are you motivated to take a step towards a doctorate and open up exciting career opportunities? As a PhD Candidate with us, you will work to achieve your doctorate, and at the same time gain valuable experience that qualifies you for a further career in higher education and research, in and outside academia.

Your immediate leader will be the Head of Department.

Duties of the position

- Complete the doctoral education until obtaining a PhD degree
- Develop mathematical models, and obtain numerical solutions for the research topics as agreed, and described above
- Preparation of scientific papers
- Dissemination of results in project meetings, and national and international workshops and conferences
- Active participation in the Electrochemical research group at IMA, as well as in FME ZeMe

Required selection criteria

- You must have a relevant master’s degree in Chemistry, Chemical Engineering, Physics, Materials Science, Applied Mathematics or equivalent. Your course of study must correspond to a five-year Norwegian course, where 120 credits have been obtained at master's level. Master students can apply, but the master's degree must be obtained and documented before starting the position.
- You must have a strong academic background from your previous studies and have an average grade from your Master's degree study, or equivalent education, which is equal to B or better compared to NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic foundation. If you have a weaker grade background, you may be considered 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 Programme https://www.ntnu.edu/nv/phd
- Good oral and written presentation skills in English language.
- Good theoretical background in electrochemistry and electrochemical processes
- Knowledge of applied mathematical modelling, in particular numerical solution of partial differential equations

- Experience with one or more relevant programming languages/tools (Python, C, Matlab, OpenFOAM etc.)

PLEASE NOTE: For detailed information about what the application must contain, see paragraph “About the application”.

The appointment is to be made in accordance with NTNUs guidelines for recruitment positions and Regulations for the degrees philosophiae doctor (ph.d.) and philosophiae doctor (ph.d.) in artistic development work at the Norwegian University of Science and Technology (NTNU)for general criteria for the position.

Preferred selection criteria

- Experience with numerical solution of partial differential equations with relevant tools
- Knowledge of the aluminium production process in Hall-Héroult cells
- Experience with scientific writing

Personal characteristics

To complete a doctoral degree (PhD), it is important that you are able to:

- Work independently
- Work in a structured way, set goals and make plans to achieve them
- Get involved and contribute constructively with feedback
- Show curiosity and a strong motivation for the subject
- Be flexible and open to adjusting the plan for the project as needed

Emphasis will be placed on personal qualities.

We offer

- An exciting job with an important mission in society
- Developing tasks in a strong and international professional environment
- Open and inclusive working environment with committed colleagues
- Favorable terms as a member of the Norwegian Public Service Pension Fund (SPK)
- Free Norwegian language training at a basic level (A2)

As a PhD Candidate at NTNU, you will have access to employee benefits.

Diversity

Diversity is a strength, and at NTNU we aim to be an employer that reflects the diversity in society and that makes use of the potential of the population's collective skills. Our vision is Knowledge for a better world and our values are creative, critical, constructive and respectful. We believe that an organization that is equal, diverse and gender-balanced is essential for us to achieve our goals.

We strive to attract employees with different skills, life experiences and perspectives to contribute to even better problem solving of our societal mission in research and education.

If you think this position is relevant and interesting, we encourage you to apply, regardless of gender, functional ability and cultural background, or whether you have been out of work for a period of time.

At NTNU we want to increase the proportion of women in scientific positions. We have a number of measures to promote equality.

Salary and conditions

In the position of PhD Candidate, code 1017, your gross salary will normally be NOK 550 800,-per annum. A 2% statutory contribution to the State Pension Fund is deducted from the salary.

The employment period is 3 years.

For employment as a PhD Candidate, it is a prerequisite that you gain admission to the PhD programme in Materials Science and Engineering (https://www.ntnu.edu/studies/phmt) within three months of your employment contract start date, and that you participate in an organized doctoral programme through out the period of employment.

The position is conditional on external funding.

As an employee at NTNU, it is important that you keep yourself up to date with academic and organizational changes and adapt to them.

For the necessary professional and social interaction, it is a prerequisite that you are physically present and available to the institution on a daily basis.

The appointment is carried out in accordance with the principles of the State Employees Act, and Export control (legislation that regulates the export of knowledge, technology and services). Candidates who, after assessment of the application and attachments, are considered to bein conflict with the criteria in the latter act, will not be able to be employed.

About the application

The attachments (including a description of your scientific work) must accompany the application as these documents form the basis of the application assessment. The documents must be in Norwegian/a Scandinavian language or English.

Please note: the application will only be assessed on the basis of the information we have received by the application deadline. Therefore, make sure that your application clearly shows how your skills and experience meet the criteria described above. The application and all attachments must be sent electronically via Jobbnorge.no. If you are invited to an interview, you must bring certified copies of certificates and diplomas upon request.

The application must include:

- Transcripts and diplomas for bachelor's and master's degrees
- CV
- Copy of master's thesis. If you have recently 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.
- Short letter of motivation (400 words/1 page)
- Possibly publications etc. other relevant research work
- Names and contact information of minimum 2 relevant referees

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. If your institution uses "diploma supplement" (normal for most European institutions), you must attach this. A description of the documentation required can also be found here. If you already have a statement from Norwegian Directorate for Higher Education and Skills (HK-dir), please attach this as well.

Joint work will be considered. If it is difficult to identify your contribution to joint work, you must attach a brief description of your participation.

When assessing the best qualified, we emphasize necessary qualifications such as education, experience and personal suitability. Motivation for the position, ambitions, and potential for research will also count when assessing the candidates.

NTNU recognizes a wide range of academic contributions and has committed itself to The San Francisco Declaration on Research Assessment and CoARA (responsible assessment of research and recognition of a greater breadth of academic contributions in accordance with NTNU's social mission).

General information

A public list of applicants with name, age, job title and municipality of residence is prepared after the application deadline. If you wish to be exempt 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 exemption is not granted.

If you think this position looks interesting and in line with your qualifications, you are welcome to apply.

If you have any questions about the position, please contact Professor Ann Mari Svensson e-mail: annmari.svensson@ntnu.no, tel: +4798230450, or Senior Researcher Kristian E. Einarsrud, e-mail: Kristian.Einarsrud@sintef.no, tel: +4741190763).

If you have any questions about the recruitment process, please contact HR consultant Marie Kristiansen, e-mail: marie.kristiansen@ntnu.no.

Application deadline: 25.01.2025

For practical information about working at NTNU, please visit this webpage.

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the tech 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.

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 Materials Science and Engineering

We are Norway's leading educational and research environment in materials engineering, materials chemistry and materials science. In collaboration with business and industry, we are a driving force for the development of innovative materials as well as new applications and manufacturing processes. Activities in our disciplines are vital for the green shift. The Department of Materials Science and Engineering is one of eight departments in the Faculty of Natural Sciences.

Additional information

Contact persons:

- Ann Mari Svensson, Professor
  Phone: +4798230450 | E-mail: annmari.svensson@ntnu.no
- Kristian E. Einarsrud, Senior Researcher
  Phone: +4741190763 | E-mail: Kristian.Einarsrud@sintef.no

Place of service: