UiT The Arctic University of Norway
Department of Physics and Technology

Jobbnorge ID: 279556
Deadline: 6/10/2025
Website: https://uit.no/startsida
Scope: Fulltime
Duration: Fixed Term

Faculty of Science and Technology

PhD Fellow in sea ice remote sensing research

The position

A position in remote sensing of sea ice is available at the Department of Physics and Technology, Faculty of science and technology with the Earth Observation Group. The position is for a period of four years. The nominal length of the PhD programme is three years. The fourth year is distributed as 25 % each year and will consist of teaching and other duties.

The objective of the position is to complete research training to the level of a doctoral degree. Admission to the PhD programme is a prerequisite for employment, and the programme period starts on commencement of the position.

The workplace is at UiT in Tromsø. You must be able to start in the position within a reasonable time after receiving the offer.

The project

The position's objective is to advance sea ice remote sensing research in one of three topics:

- 1. Combining synthetic aperture radar (SAR) images with probabilistic weather prediction models to view and predict dynamic sea ice properties.
- 2. Using multi-frequency SAR, coupled with in-situ and airborne observations, to answer questions related to how the snow affects the radar signature and investigate the seasonal evolution, in advance of EU ROSE-L mission launch in 2028.
- 3. Investigating key unanswered questions for satellite radar altimeter detection of snow-covered sea ice thickness, with in-situ and airborne observations, in advance of the EU CRISTAL mission launch in 2027.

This will provide qualification for work both in academic positions and industry afterwards. The position is funded by UiT The Arctic University of Norway, though the work will be carried out in collaboration with international partners from Canada, Germany and/or Sweden (depending on the chosen topic). The successful candidate will work in the UiT Earth Observation Group. This group currently consists of four permanent academic staff members, six postdoctoral fellows and seven other PhD fellows. The EO Group is specialized in remote sensing with a focus on Arctic sea ice and snow applications and developing data analysis methods, so the PhD candidate will benefit from collaborations within the group.

Roles and responsibilities of the PhD fellow

The candidate's specific research tasks will include the following.

Project 1: Combining synthetic aperture radar (SAR) images with probabilistic weather prediction models to view and predict dynamic sea ice properties. While the past dynamical behavior may be estimated stepwise from time series of the RS images, numerical models can provide continuous predictions of drift and deformation fields. This project shall investigate how the combined use of image time series analysis and numerical drift modelling can improve accuracy and reliability in operational services producing sea ice charts and work towards novel dynamic ice charts of the future.

- Analyze past images to estimate drift and deformation fields to study sea ice dynamics.
- Extract ensemble drift model information to predict future sea ice locations.
- Integrating past knowledge and ensemble drift information to improve future predictions of sea ice states and develop temporally dynamic viewing methods.

Project 2: Using multi-frequency SAR, coupled with in-situ and airborne observations, to answer questions related to how the snow affects the radar signature and investigate how this evolves over a season, in advance of EU ROSE-L mission launch in 2028 and for NISAR's launch in 2025. Both missions carry an L-band sensor, with scientific missions to monitor the Arctic and cryosphere. With a changing Arctic the melt season is prolonged, and with these changes to the snow-covered sea ice. Within this project the student will:

- Prepare for and participate in a fieldwork campaign in the Canadian Arctic to collect in situ snow and ice observations under aircraft overflights

- Use multi-frequency SAR data to assess from where within the snowpack or from the sea ice the radar backscatter signature originates, and how this varies with frequency.
- Investigate the impact of changing snow properties over a full season on the scattering properties, the scattering origin and consequently on the radar backscatter.

Project 3: Investigating key unanswered questions for satellite radar altimeter detection of snow-covered sea ice thickness, with in-situ and airborne observations, in advance of the EU CRISTAL mission launch in 2027. The EU/ESA mission CRISTAL, set to launch in 2 or 3 years, will include a dual-frequency Ku-/Ka-band interferometric SAR altimeter, with a primary goal to measure snow depth on and the thickness of sea ice in the polar regions. However, the interactions of Ku- and Ka-band radar waves with snow and sea ice are not fully understood, demanding further research effort before we can take full advantage of the CRISTAL observations. In this project the student will:

- Prepare for and participate in a fieldwork campaign in the Canadian Arctic to collect in situ snow and ice observations under aircraft overflights
- Use existing radar echo modelling tools to simulate CRISTAL-type satellite waveforms from in situ and airborne datasets
- Investigate the impacts of surface roughness, snow properties and structure, and sea ice properties on the accuracy of snow depth and ice thickness derived from CRISTAL-type data

It is expected that the candidate will publish their results in scientific, peer-reviewed journals (3 papers), present them at meetings and international conferences and finally write up and defend a PhD thesis.

Want to know more about the position?

For further information about the position, please contact:

- Professor Anthony P. Doulgeris (UiT) by email: anthony.p.doulgeris@uit.no
- Associate Professor Malin Johansson (UiT) by email: malin.johansson@uit.no
- Associate Professor Jack Landy (UiT) by email: jack.c.landy@uit.no

Qualifications

This position requires:

- A master’s degree or equivalent in a relevant discipline (e.g. physics, geosciences, computer science, mathematics/statistics, geodesy, environmental science, etc.). If you are near completion of your master’s degree, you may still apply.
- Documented fluency of in English and be able to work in an international environment. Nordic applicants can document their English capabilities by attaching their high school diploma.
- Fulfillment of the requirements for admission to the PhD program (next section)

In the assessment, the emphasis is on the applicant's potential to complete a research education based on the master's thesis or equivalent, and any other scientific work. In addition, other experience of significance for the completion of the doctoral programme may be given consideration.

The suitable candidate must have:

- Strong programming skills (preferably Python or MATLAB)
- Experience with using satellite remote sensing data (ideally for polar applications)
- Strong background in statistics

International experience is an advantage. Emphasis is also given to personal suitability.

Other desired skills include:

- High self-motivation and interest in the topic
- Ability to work independently
- Great analytical and problem-solving skills
- Excellent work ethic and commitment to the job

Applicants must document proficiency in Norwegian, Swedish or Danish at a minimum of level A2. If the candidate does not document proficiency in Norwegian, Swedish or Danish at level A2, then the doctoral fellow must complete a language course equal to 15 ECTS before the end of the fixed-term period. UiT will facilitate this.

As many people as possible should have the opportunity to undertake organized research training. If you already hold a PhD or have equivalent competence, we will not appoint you to this position.

Admission to the PhD programme

For employment in the PhD position, you must be qualified for admission to the PhD programme at the Faculty of Science and Technology and participate in organized doctoral studies within the employment period.

Admission normally requires:

- A bachelor's degree of 180 ECTS and a master's degree of 120 ECTS, or an integrated master's degree of 300 ECTS.

In order to gain admission to the programme, the candidate must document sufficient potential for research. The applicant must have a grade point average of C (strong 3.0) or better for the master’s degree, which must contain an independent work. A more detailed description of admission requirements can be found here.

If you are employed in the position, you will be provisionally admitted to the PhD programme. Application for final admission must be submitted no later than two months after taking up the position.

Applicants with a foreign education will be subjected to an evaluation of whether the educational background is equal to Norwegian higher education, following national guidelines from Norwegian Directorate for Higher Education and Skills. Depending on which country the education is from, one or two additional years of university education may be required to fulfil admission requirements, e.g. a 4-year bachelor's degree and a 2-year master's degree. UiT normally accepts higher education from countries that are part of the Lisbon Recognition Convention.

Inclusion and diversity

UiT The Arctic University of Norway is working actively to promote equality, gender balance and diversity among employees and students, and to create an inclusive and safe working environment. We believe that inclusion and diversity are a strength, and we want employees with different competencies, professional experience, life experience and perspectives.

If you have a disability, a gap in your CV or immigrant background, we encourage you to tick the box for this in your application. If there are qualified applicants, we invite at least one in each group for an interview. If you get the job, we will adapt the working conditions if you need it. Apart from selecting the right candidates, we will only use the information for anonymous statistics.

We offer

- The chance to work on a cutting-edge project collaborating with international partners
- Possibilities to join fieldwork (depending on topic selected)
- Good career opportunities
- A fantastic, lively work environment with nice and social colleagues
- Opportunities to travel and flexible working hours
- Pension scheme through the state pension fund
- A cosy hometown of Tromsø surrounded by the stunning landscape of Northern Scandinavia
- PhD Fellows are normally given a salary of 550 000 NOK/year with a 3% yearly increase
- If you have to relocate to Tromsø then the Faculty of Science and Technology may reimburse your moving costs. Further details regarding this matter will be made available if you receive an offer from us.

Norwegian health policy aims to ensure that everyone, irrespective of their personal finances and where they live, has access to good health and care services of equal standard. As an employee you will become member of the National Insurance Scheme which also include health care services.

More practical information about working and living in Norway can be found here: https://uit.no/staffmobility

How to apply

Your application must include:

- **Introduction- and motivation letter**, including an explanation of which of the three research topics you are interested in and why (max 1 page)
- **CV** (max 2 pages)
- **Diploma** for bachelor's and master's degree
- **Official transcripts** of grades/academic record for bachelor's and master's degree
- **Explanation** of the grading system for foreign education (Diploma Supplement if available)
- **Documentation** of English proficiency
- **Documentation** of proficiency in Norwegian, Swedish, or Danish at a minimum of level A2 (if available)
- **3 references** with contact information, including the master thesis supervisor
- **Master's thesis**, and any other academic works

Qualification with a master's degree is required before commencement in the position. If you are near completion of your master's degree, you may still apply and submit a draft version of the thesis and a statement from your supervisor or institution indicating when the degree will be obtained. You must still submit your transcript of grades for the master's degree with your application.

All documentation to be considered **must** be in a Scandinavian language or English. Diplomas and transcripts must also be submitted in the original language, if not in English or Scandinavian. If English proficiency is not documented in the application, it must be documented before starting in the position. We only accept applications and documentation sent via Jobbnorge within the application deadline.

General information

The appointment is made in accordance with State regulations and guidelines at UiT. At our website, you will find more information for applicants.

The engagement is to be made in accordance with 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.

After the appointment you must assume that there may be changes in the area of work.

Remuneration for the position of PhD Fellow is in accordance with the State salary scale code 1017. A compulsory contribution of 2 % to the Norwegian Public Service Pension Fund will be deducted. You will become a member of the Norwegian Public Service Pension Fund, which gives you many benefits in addition to a lifelong pension: You may be entitled to financial support if you become ill or disabled, your family may be entitled to financial support when you die, you become insured against occupational injury or occupational disease, and you can get good terms on a mortgage. Read more about your employee benefits at: spk.no.

A shorter period of appointment may be decided when the PhD Fellow has already completed parts of their research training programme or when the appointment is based on a previous qualifying position PhD Fellow, research assistant, or the like in such a way that the total time used for research training amounts to three years.

We process personal data given in an application or CV in accordance with the Personal Data Act (Offentleglova). According to the Personal Data Act information about the applicant may be included in the public applicant list, also in cases where the applicant has requested non-disclosure. You will receive advance notification in the event of such publication, if you have requested non-disclosure.

Assessment

The applicants will be assessed by an expert committee. The committee's mandate is to undertake an assessment of the applicants' qualifications based on the written material presented by the applicants, and the detailed description draw up for the position. A copy of the assessment report will be sent to all applicants.

The applicants who are assessed as best qualified will be called to an interview. The interview should among other things, aim to clarify the applicant’s motivation and personal suitability for the position.

Eallju - Developing the High North

UiT The Arctic University of Norway is a multi-campus comprehensive university at the international forefront. Our vision is to be a driving force for developing the High North. The Northern Sami notion eallju, which means eagerness to work, sets the tone for this motive power at UiT. Along with students, staff and the wider community, we aim to utilise our location in Northern Norway and Sápmi, our broad and diverse research and study portfolio and interdisciplinary advantage to shape the future.

Our social mission is to provide research-based education of high quality, perform artistic development and carry out research of the highest international quality standards in the entire range from basic to applied. We will convey knowledge about disciplines and contribute to innovation. Our social mission unites UiT across various studies, research fields and large geographical distances. This demands good cooperation with trade and industry and civil society as well as with international partners. We will strengthen knowledge-based and sustainable development at a regional, national and international level.

Academic freedom and scientific and ethical principles form the basis for all UiT’s activities. Participation, co-determination, transparency and good processes will provide the decision-making basis we need to make wise and far-sighted priorities. Our students and staff will have the opportunity to develop their abilities and potential. Founded on academic integrity, we will be courageous, committed and generous in close contact with disciplines, people and contemporary developments.

We will demonstrate adaptability and seek good and purposeful utilisation of resources, so we are ready to meet the expectations and opportunities of the future. We will strengthen the quality and impact of our disciplines and core tasks through the following three strategic priority areas.

Additional information

Place of service:

Hansine Hansens veg18 9019 Tromsø (Tromsø - Romsa Municipality)