



Jobbnorge ID: 206276
Deadline: 7/17/2021
Website: <https://uit.no/startside>
Scope: Fulltime
Duration: Fixed Term

Faculty of Science and Technology

2-3 PhD positions in computational plasma physics

The position

The UiT Aurora Centre DYNAMO announces vacant PhD fellow positions in the area of computational plasma physics at UiT The Arctic University of Norway.

The positions are available for commencement from mid-2021. The appointment is for a period of four years, where one year is allocated for teaching or other duties for the department where the fellow is hired. The duties are normally distributed evenly over the four-year period. The possible third position is for a period of three years. The objective of the positions is to complete research training to the level of a doctoral degree. Admission to a PhD programme is a prerequisite for employment, and the programme period starts on commencement of the position.

The fellows will work in a large, international, and interdisciplinary team and will have possibilities for research stays abroad. The positions will be supervised by the [Department of Mathematics and Statistics](#) and the [Department of Physics and Technology](#).

The workplace is at UiT in Tromsø. You must be able to start in the position in Tromsø within a reasonable time, and within 6 months after receiving the offer.

The position's field of research

The three positions are devoted to turbulence modeling in the periphery of magnetically confined fusion plasmas and operate at the intersection between numerical mathematics, plasma physics and scientific computing.

To this end the PhD students will develop gyro-fluid models and numerical methods to efficiently discretize and study them within the scientific code FELTOR (for further information visit the official project webpage: <https://feltor-dev.github.io/>).

The three PhD positions are structured according to the focus of the PhD theme:

- **Plasma theory focus:** This position is concerned with the development of rigorous closures of full-F gyro-fluid models and their numerical implementation within FELTOR. These closures will encompass the purely collisional and collisionless regimes but also envision to bridge these two regimes.
- **Numerical mathematics focus:** This position addresses the efficient and accurate discretization of full-F gyro-fluid models within discontinuous Galerkin methods. To this end numerical methods will be developed to efficiently handle the multi-scale and anisotropic nature of magnetically confined fusion plasmas. In particular to enable both whole device modeling as well as accurate wall treatment of current and future fusion devices.
- **Scientific computing focus:** This position is devoted to first principles-based modeling of the turbulent transport in the boundary region of high-field tokamaks, such as Alcator C-Mod and the upcoming SPARC experiment at the MIT Plasma Science and Fusion Center. Here, full-F gyro-fluid simulations will elucidate the interplay between mean flows and turbulent fluctuations, but also provide predictions of profiles and turbulent fluctuations, which will be compared to experimental measurements.

On top of that, further freedom in the execution and development of the PhD themes is given depending on the students abilities and interests.

Research themes - DYNAMO

The UiT Aurora Centre DYNAMO is organized in three research themes: the climate system, Arctic ecosystems, and fusion plasmas. These are areas of research where complex systems modelling is particularly fruitful. The implementation is structured into four work packages corresponding to the main methodological frameworks: long range dependence and temporal scale invariance, bifurcations and transients, instabilities and chaotic dynamics, and ensemble studies.

Scientific computations and data analysis are essential tools in all research themes and work packages. The main objective is to develop and combine dynamical, phenomenological and stochastic models in order to describe non-linear dynamics and emergent structures common to complex systems.

Contact

Further information about the positions, UiT, and project details is available by contacting:

- Co-leader of the FELTOR code project associate professor Markus Held, e-mail markus.held@uit.no
- DYNAMO centre leader and fusion plasma research theme leader professor Odd Erik Garcia by e-mail odd.erik.garcia@uit.no or telephone +47 77 64 51 91
- Head of Department of Mathematics and Statistics and climate system research theme leader professor Martin Rypdal by e-mail martin.rypdal@uit.no or telephone +47 77 62 07 54

Qualifications

This position requires a Norwegian Master's degree within applied mathematics, statistics or physics, or a corresponding foreign Master's degree recognized as equivalent to a Norwegian Master's degree within the same areas.

The suitable candidate must have a background in plasma physics or applied/numerical mathematics and should have excellent skills in computer programming, in particular C++ and python. Knowledge of discontinuous Galerkin methods and gyro-fluid or -kinetic theory are considered an advantage. Other required qualification skills include:

- Excellence in master thesis work and from grade transcripts
- Independence and self-motivation
- Creativity and ability to think outside the box
- Excellent work ethic and commitment to the job
- Good communication skills

Applicants must document fluency of in English and be able to work in an international environment. International experience is an advantage.

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

We will also emphasize motivation and personal suitability for the position.

As many 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 Health Sciences](#) 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.
- A master's thesis with a scope corresponding to at least 30 ECTS for a master's degree of 120 ECTS.
- A master's thesis with a scope corresponding to at least 20 ECTS for an integrated master's degree of 300 ECTS.

In order to gain admission to the programme, the applicant must have a grade point average of C or better for the master's degree and for relevant subjects of the bachelor's degree. A more detailed description of admission requirements can be found [here](#).

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 [NOKUT](#).

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.

Inclusion and diversity

UiT The Arctic University i 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 is 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 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.

Application

Your application must include:

- Application and motivation letter, indicating the PhD focus of interest (max 1 page)
- CV (max 2 pages)
- Diploma for bachelor's and master's degree
- Transcript 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](#)
- Three references, preferably including the Master's thesis supervisor

- Master's thesis, and, if applicable, other academic works, up to ten

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 document completion of your degree before commencement in the position. You must still submit your transcripts 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 a Scandinavian language. We only accept applications and documentation sent via Jobbnorge within the application deadline.

We offer

- Involvement in an interesting research project
- A fantastic work environment with friendly and dedicated colleagues
- Excellent career opportunities
- A large degree of independence in work
- Opportunities to travel and meet other leading scientists within the field
- Pension scheme through the state pension fund
- More practical information for working and living in Norway can be found here: <https://uit.no/staffmobility>

UiT also has good welfare arrangements for employees including beneficial arrangements for pension and insurances.

The UiT campus is located near the centre of Tromsø, a vibrant city located in Northern Norway with approximately 75 000 inhabitants. The city is surrounded by the stunning landscape of Northern Scandinavia. The location also offers ample opportunities for e.g., sighting aurora, hiking and skiing.

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](#).

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.

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.

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.

UiT - Developing the High North

UiT The Arctic University of Norway

UiT is a multi-campus research university in Norway and the northernmost university of the world. Our central location in the High North, our broad and diverse research and study portfolio, and our interdisciplinary qualities make us uniquely suited to meet the challenges of the future. At UiT you can explore global issues from a close-up perspective.

Credibility, academic freedom, closeness, creativity and commitment shall be hallmarks of the relationship between our employees, between our employees and our students and between UiT and our partners.

UiT Aurora Centre DYNAMO

UiT The Arctic University of Norway has established the UiT Aurora Centre for Nonlinear Dynamics and Complex Systems Modelling (DYNAMO). This is an interdisciplinary centre with thematic focus on the most profound challenges for our society - climate change, its impact on ecosystems, and its mitigation by development of fusion power as an unlimited source of sustainable energy.

The announced positions will strengthen the Aurora Centre by recruiting excellent researchers within relevant areas of climate science, fusion plasma physics and complex systems modelling. The successful candidates will perform research in close collaboration with other members of the DYNAMO centre and its extensive international network.

Additional information

Place of service:

UiT in Tromsø 9019 Tromsø (Tromsø - Romsa Municipality)