NTNU
Norwegian University of Science and Technology

We are looking for a

PhD candidate in genomics of Arctic alien plants

Apply for this job

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 44,000 students work to create knowledge for a better world.

You will find more information about working at NTNU and the application process here.

About the job

The NTNU University Museum is seeking a highly qualified, ambitious and motivated PhD candidate for a project focusing on **genomics of Arctic**

alien plants. The project will focus on target alien plant species and seek to uncover their genomic basis of adaptation to the Arctic environment and how it relates to their invasiveness.

A warming climate, changes in soil properties, and rising human activity in the Arctic increase the probability of introduction and establishment of alien plant species. In high-Arctic Svalbard and other Arctic regions, the wintercress (Barbarea vulgaris) is an established and naturalized alien species. Hypotheses for its success include multiple introductions from different genetic sources, enemy release advantage related to plant defense compounds, and shifts in adaptive traits. The PhD project will develop genomic datasets, making use of field collections and herbarium resources, and develop experimental evidence to examine links between the genomic basis of successful establishment and potential invasiveness in the high-Arctic. The wintercress will be a primary focus of the project, but complementary research on parallel systems may be developed. The project will add an important evolutionary component to ongoing interdisciplinary research on Arctic greening.

The successful candidate will be employed at the NTNU University Museum's Department of Natural History. The NTNU University Museum is a museum of natural and cultural history. Within the Department of Natural History, research is conducted in the fields of biogeography, biosystematics, and ecology with an emphasis on conservation biology. The candidate will be advised by Associate Professor Kristine Bakke Westergaard, and will use the herbarium, genomics laboratory facilities and computational resources at the Museum in his or her research. The work will be closely associated with a project on Arctic greening based at ETH Zürich (Switzerland), with Dr. Simone Fior as a co-supervisor.

For a position as a PhD candidate, the goal is a completed doctoral education up to an obtained doctoral degree. Publication of the project results in peer-reviewed journals is expected.

Duties of the position

The work of the PhD candidate will consist of arctic field work, herbarium work, green house experimental work, DNA lab and bioinformatics in an international interdisciplinary team. More specifically, the successful candidate will:

- assemble a spatial and temporal sampling of herbarium and fresh specimens
- produce NGS libraries and sequencing data using clean-lab facilities and third-party services
- manage and supervise third-party services to achieve high-quality reference genomes suitable for population genomic analyses
- analyse sequencing data combined with available genomic resources and complementary experimental evidence to unravel the evolutionary history of parallel Arctic invasions, including the phylogeography of established populations, the genetic architecture of adaptation to the Arctic environment, and the role of different chemotypes in the context of the enemy release hypothesis
- analyses of temporal data to assess turnover of allele frequencies following introduction and bottlenecks
- design and perform common garden experiments to test the adaptive role of shifts in enemy pressure, breeding system and life-history traits underlying invasiveness under current and future climate
- disseminate results in scientific literature, to relevant stakeholders and the public.

Required selection criteria

- Master's degree in biology (or equivalent) with specialization in molecular ecology, evolutionary biology, biosystematics or closely related fields.
- Experience at the master’s level with analyses of NGS data to answer evolutionary questions.

- Strong interest in pursuing research in invasion biology using multidisciplinary approaches (population genomics, phylogeography, adaptation genomics, and ecology).
- Education corresponding to a five-year Norwegian degree program, with 120 credits obtained at master's level.
- Average grade from the master's degree program, or equivalent education, 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.
- Meet the requirements for admission to the faculty's doctoral program.
- Excellent written and oral English language skills.

Preferred selection criteria

- Use of herbarium collections, production of NGS data using clean-lab protocols, and application of downstream analytical tools.
- Use of modern statistical techniques using relevant scripting languages (R, python etc).
- Experience with ecological experiments aimed at testing specific hypotheses in a multi-factorial design.
- Knowledge of northern ecosystems, and specializations in alien species, biogeography and arctic biology
- Knowledge of biochemical assays, plant-herbivore interactions, chemotype-based taxonomy
- Experience with field work under comparatively challenging conditions.
- Passion for communicating science to a range of audiences.

Personal characteristics

The PhD candidate must be self-motivated, enthusiastic, goal and solution oriented. Good cooperative skills and a desire to work collaboratively with

people having diverse research interests are essential. Emphasis will be placed on personal and interpersonal qualities.

We offer

- A strong international research environment highly relevant for career development in both basic and applied research and public sector
- Scientific and technical support provided by research groups with long-term experience in Arctic fieldwork, biology, evolutionary genetics, and ecology
- Exciting and stimulating tasks
- 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 501 200 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 position is available from **March 1st 2023**, thus master student graduating before this date can apply. The period of employment is four years, with 25% of the time allocated to collection work, teaching and public outreach.

Appointment to a PhD position requires that you are admitted to the PhD programme in Biology within three months of employment, and that you participate in an organized PhD 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.

It is a prerequisite you can be present at and accessible to the institution on a daily basis.

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 follow 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 letter of motivation (max. 2 pages) stating specifically why you believe you meet the selection criteria.
- CV, certificates and diplomas.
- 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.
- Publications or other scientific work, if you have such.
- Contact information for two 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. Description of the documentation required can be found here. If you already have a statement from NOKUT, please attach this as well.

Joint works will be considered. 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 suitability, as well as motivation and the content of the cover letter, in terms of the qualification requirements specified in the advertisement.

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 is our strength. 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.

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 associate professor Kristine Bakke Westergaard (telephone +47 98072974, email kristine.b.westergaard@ntnu.no). If you have any questions about the recruitment process, please contact HR-Manager Christen Torvik, e-mail christen.torvik@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: 02.01.2023

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.
NTNU University Museum

The NTNU University Museum is one of Norway’s leading institutions in protection, conservation, exhibition and research related to natural and cultural material.

We are one of Norway’s six university museums. The museum has two departments, a national laboratory for age determination, an exhibition and events section, and an administration.

Apply for this job

Deadline

2nd January 2023

Employer

NTNU - Norwegian University of Science and Technology

Municipality

Trondheim

Scope

Fulltime

Duration

Temporary

Place of service