



PhD Research Fellowship in Experimental Heavy-Ion Physics

Job description

A position as PhD Research Fellow in Experimental Heavy-Ion Physics is available at The Department of Physics, University of Oslo.

No one can be appointed for more than one PhD Research Fellowship period at the University of Oslo.

If the successful candidate has a good knowledge of one Scandinavian language (Norwegian, Swedish, Danish), the fellowship will be for a period of 4 years, with 25 % compulsory work (teaching at the Department of Physics). Otherwise, the fellowship will be for a period of 3 years, with no compulsory work. Starting date will be agreed upon.

More about the position

The position is associated with the Norwegian ALICE project at CERN, funded by the Norwegian Research Council. The heavy-ion group of the Department of Physics, University of Oslo, participates in the ALICE experiment, which in 2015 entered a second round of data taking from ultrarelativistic proton-proton, lead-lead and proton-lead collisions at the Large Hadron Collider at CERN (LHC Run-2). During this run period, ALICE aims for a precision characterization of the hot quark-gluon plasma, exploiting its superior capability in identifying particles at low and intermediate transverse momenta and utilizing rare signals, among others in the heavy flavour sector. In addition to physics analysis, the group is also involved in instrumentation activities associated with the ALICE Inner Tracking System (ITS), in collaboration with the heavy-ion groups at the University of Bergen.

The candidate is expected to contribute to the Norwegian ALICE activities within analysis and interpretation of physics data taken with the ALICE detector during the Run-2 part of the LHC programme.

The primary scientific interest of the Norwegian ALICE groups for the Run-2 period is quantitative studies of the hot partonic matter formed in the early stage of heavy-ion collisions and also of the influence of cold nuclear matter effects, utilizing rare tomographic probes involving heavy quarks, in particular charmonia measured in the di-electron channel at mid-rapidity.

Other analysis topics include collective anisotropic expansion (flow) and penetrating tomographic probes like photons / electrons, hadrons with high transverse momenta and their correlations. The preferred physics analysis focus for this PhD project would be to contribute to the ongoing studies of charmonium production. Charmonium states display a complex and interesting behaviour in the nuclear medium. The data material taken so far has shown strong hints of a novel quark-gluon plasma signature; charmonium production through a recombination mechanism, permitted by the higher density of charm-anti-charm quark pairs in this unprecedentedly hot plasma. High-statistics Run-2 Pb-Pb collision data, planned late autumn 2018, is expected to verify this phenomenon. Specific topics for this thesis might then be differential studies of the charmonium nuclear modification factor in the heavy-ion system as a function of centrality and transverse momentum, and / or collective anisotropic flow of charmonium, probing the degree of thermalization of charm quarks with the expanding medium. Other studies undertaken by the Norwegian groups address the detailed QCD nature of the charmonium production, using correlations between charmonia and soft hadrons in p-p and p-Pb collision data, and the separation of the prompt contribution to the charmonium cross section from the non-prompt one (feed-down from beauty hadrons) in p-p collisions.

The candidate will be based in Oslo, but will be expected to spend some time participating in data taking and other ALICE activities at CERN.

Information about the research at The Department of Physics is found on: <http://www.mn.uio.no/fysikk/english/research/groups/>

Qualification requirements

- Master's degree or equivalent in experimental high-energy heavy-ion physics / high-energy particle physics.
 - the average grade point for courses included in the Master's degree must be B or better in the Norwegian educational system
 - the Master's thesis must have the grade B or better in the Norwegian educational system
 - the average grade point for courses included in the Bachelor's degree must be C or better in the Norwegian educational system
- Good programming skills with experience in data analysis and / or simulations
- All Ph.D. candidates must demonstrate high English language skills. International applicants must document these skills prior to admission to the PhD programme by passing one of the following tests with these or better grades:
 - TOEFL - Test of English as Foreign Language, internet based test (IBT). Minimum total score: 80
 - IELTS - International English Language Testing Service. Minimum overall band score: 6.5
 - Certificate in Advanced English (CAE) and Certificate of Proficiency in English (CPE) from the University of Cambridge
 - PTE Academic - Pearson Test of English Academic. Minimum overall score: 62
 - Please [see here](#) for exemptions to the English requirements.

Other desired qualifications include:

- Experience from working in large experimental high-energy physics collaborations (LHC / RHIC), preferably with ALICE physics analysis projects, and a scientific profile matching the Norwegian ALICE physics research programme as outlined above

The Faculty of Mathematics and Natural Sciences has a strategic ambition of being a leading research faculty. Candidates for these fellowships will be selected in accordance with this, and expected to be in the upper segment of their class with respect to academic credentials.

The purpose of the fellowship is research training leading to the successful completion of a PhD degree.

The fellowship requires admission to the PhD programme at the Faculty of Mathematics and Natural Sciences. The application to the PhD programme must be submitted to the department no later than two months after taking up the position. For more information see:

<http://www.uio.no/english/research/phd/>

<http://www.mn.uio.no/english/research/phd/>

We offer

- Salary NOK 449 400 - 505 800 per annum depending on qualifications and seniority as PhD Research Fellow, (position code 1017)
- Attractive [welfare benefits](#) and a generous pension agreement, in addition to Oslo's family-friendly environment with its rich opportunities for culture and outdoor activities

How to apply

The application must include

- Cover letter including a description of scientific interests and the motivation for applying for the position (max. 2 pages)
- CV (summarizing education, work experience and academic work, including any scientific publications and other qualifying activity)
- Copies of educational certificates, transcript of records, and letters of recommendation
- Names and contact details of 2-3 references (name, relation to candidate, e-mail and telephone number)
- Documentation of English proficiency if needed (please [see admission criteria](#))

The application with attachments must be delivered in our electronic recruiting system, please follow the link "Apply for this job". Foreign applicants are advised to attach an explanation of their University's grading system. Please note that all documents should be in English (or a Scandinavian language). Applications with documents missing will not be considered further.

Applicants of interest will normally be called in for an interview.

Formal regulations

Please see the [guidelines and regulations](#) for appointments to Research Fellowships at the University of Oslo.

According to the Norwegian Freedom and Information Act (Offentleglova) information about the applicant may be included in the public applicant list, also in cases where the applicant has requested non-disclosure.

The appointment may be shortened/given a more limited scope within the framework of the applicable guidelines on account of any previous employment in academic positions.

The University of Oslo has an [agreement](#) for all employees, aiming to secure rights to research results etc.

Contact information

Professor Trine S. Tveter, e-mail: t.s.tveter@fys.uio.no

Professor Dieter Rohrich, e-mail: dieter.rohrich@ift.uib.no

Dr. Ionut C. Arsene, e-mail: i.c.arsene@fys.uio.no

Associate Professor Erik Adli, e-mail: erik.adli@fys.uio.no

For technical questions regarding the recruitment system, please contact HR Officer Therese Ringvold, e-mail: therese.ringvold@mn.uio.no, phone: +47 22 85 16 06.

About the University of Oslo

The University of Oslo is Norway's oldest and highest rated institution of research and education with 28 000 students and 7000 employees. Its broad range of academic disciplines and internationally esteemed research communities make UiO an important contributor to society.

The research at the Department covers a broad range of subfields within physics and technology: From space research to medical physics. A good proportion of the research is interdisciplinary, and conducted in close cooperation with

collaborators in Norway and abroad. Education and teaching are other essential activities. We offer a broad range of courses, and the Department is involved in several study programmes at bachelor's and master's level. Some of the best lecturers in Norway are amongst our employees, and we are proud of our prizewinning teaching and learning environment. The Department has 200 employees, of which 50 are permanent scientific positions. On a yearly basis 20 students complete their Ph.D. and 50 finish their M.Sc. degree.

Jobbnorge-ID: 155247, Søknadsfrist: Avsluttet