

PhD position in Nanostructured Thermal Interface Materials (NanoTIM) (IV-148/19)

About the position

NTNU Department of Structural Engineering announces one vacant PhD position in **Nanostructured Thermal Interface Materials (NanoTIM)** for a period of four years, of which the time equivalent of one year will be spent on duty work at NTNU NanoLab. The PhD position is financed by NTNU enabling technologies 2019.

Interfaces are everywhere in nature and engineering. Their properties are critical to a variety of processes and systems, from thermal management of electronics, icing of surfaces in Arctic technology to renewable energy applications. When characteristic length scales range from microscale to nanoscale, a major interface thermal resistance (ITR) arises, and is intertwined and inherently coupled with other interface properties. Hereby the PhD project NanoTIM aims to control and optimize ITR across interfaces between metal and polymer by thermal interface materials (TIM). The project plans to bring nanostructured graphitic and nitride materials to interface, explore the thermal and mechanical bridging potentials, and provide TIM-based prototypes of stress-tolerating and long-lasting metal-polymer interfaces. Such an activity is central to the design of advanced multifunctional nanocomposites, next generation anti-icing materials and high efficiency thermoelectric devices.

The planned experimental work covers surface micro/nanofabrication, surface and interface characterization, heat transfer evaluation and prototype development. In particular, the project consists of two major tasks. The first task is to design and fabricate metal-TIM-polymer sandwich structure. The second task is to investigate the correlation between ITR and interface structure, TIM characteristics and mechanical stresses. In order to identify optimal design of TIM-contained metal-polymer interface, combined experimental methodologies and different nanostructured materials will be applied.

The PhD candidate will work in the research group NTNU Nanomechanical Lab (NML) www.ntnu.no/nml with Prof. Jianying He as main supervisor. NML currently has 2 professors, 2 adjunct professors from national industry, 14 PhD students, 3 postdocs working on diverse topics related to nanomechanics and interface mechanics. NML offers multicultural, multidisciplinary and stimulating working environment with weekly Friday seminars given by either internal team members or international speakers, as well as well-established national and international scientific and industry network.

In addition, the successful applicant will work for NTNU NanoLab for the time equivalent of one year out of the four-year appointment. The work at NTNU NanoLab will include process development & documentation, fabrication, characterisation, user training and other tasks relevant to the NanoLab. The candidate will gain experience in teaching and training of users as well as in various advanced nanofabrication and characterisation tools available at NTNU NanoLab (www.ntnu.edu/nano/nanolab).

Qualification requirements

The qualification requirement is completion of a master's degree or second degree (equivalent to 120 credits) with a strong academic background in nanotechnology, material physics, material science, applied mechanics, or equivalent education with a grade of B or better in terms of NTNU's grading scale.

Applicants who are unable to meet these criteria may be considered only if they can document that they are particularly suitable candidates for education leading to a PhD degree.

Applicants with no letter grades from previous studies must have an equally good academic foundation. Good English skills, spoken and written, are required.

Applicants who do not master a Scandinavian language should provide evidence of good written and oral English language skills. The following tests can be used as documentation: TOEFL, IELTS, Cambridge Certificate in Advanced English (CAE), or Cambridge Certificate of Proficiency in English (CPE). Minimum scores are:

- TOEFL: 600 (paper-based test), 92 (Internet-based test)
- IELTS: 6.5, with no section lower than 5.5 (only Academic IELTS test accepted)
- CAE/CPE: grade B or A.

The appointment is to be made in accordance with the regulations in force concerning State Employees and Civil Servants and [national guidelines for appointment as PhD, post doctor and research assistant](#).

Personal characteristics

- Motivated and ambitious students with excellent grades
- Ability to work both individually and in a team environment and a high level of personal responsibility
- excellent communication skills in scientific writing and oral presentation
- Eager to disseminate research results through publications and presentations at international conferences.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal suitability, in terms of the qualification requirements specified in the advertisement

We offer

- an experienced and supportive PhD supervising team
- a socially active international group full of positive energy
- exciting and stimulating Fridays seminars
- a network with international leading research groups
- an open and inclusive work environment with dedicated colleagues
- favourable terms in the [Norwegian Public Service Pension Fund](#)
- [employee benefits](#)

Salary and conditions

PhD candidates are remunerated in code 1017, and are normally remunerated at gross from **NOK 449 400** (approximately **47000 Euro**) per annum before tax. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.

Appointment to a PhD position requires admission to the PhD programme in Engineering <https://www.ntnu.edu/studies/phiv>. As a PhD candidate, you undertake to participate in an organized PhD programme during the employment period. A condition of appointment is that you are in fact qualified for admission to the PhD programme within three months.

Appointment takes place on the terms that apply to State employees at any time, and after the appointment you must assume that there may be changes in the area of work.

General information

A good work environment is characterized by diversity. We encourage qualified candidates to apply, regardless of their gender, functional capacity or cultural background. Under the Freedom of Information Act (Offentleglova), information about the applicant may be made public even if the applicant has requested not to have their name entered on the list of applicants.

Questions about the position can be directed to Prof. Jianying He, phone number +47 7359 4686, e-mail jianying.he@ntnu.no. No application should be directly sent to the email address.

About the application:

Publications and other academic works that the applicant would like to be considered in the evaluation must accompany the application. Joint works will be considered. If it is difficult to identify the individual applicant's contribution to joint works, the applicant must include a brief description of his or her contribution.

Please submit your application electronically via www.jobbnorge.no with your CV, diplomas and certificates. Applicants invited for interview must include certified copies of transcripts and reference letters. Please refer to the application number when applying.

Application deadline: 30.04.19