PhD in Metal-Organic Frameworks for energy harvesting

Department/faculty: Applied Sciences
Level: Master degree
Working hours: 38 hours per week
Contract: 4 years
Salary: €2222 to €2840

Applied Sciences

The Faculty of Applied Sciences is the largest faculty of TU Delft, with around 550 scientists, a support staff of 250 and 1,800 students. The faculty conducts fundamental, application-oriented research and offers scientific education at the bachelor, master and doctoral levels. The faculty is active in the fields of Life and Health Science & Technology, Nanoscience, Chemical Engineering, Radiation Science & Technology, and Applied Physics.

The Department of Chemical Engineering promotes the pursuit and dissemination of knowledge in chemical engineering, with a focus on materials for energy and health applications. We aspire to improve the quality of life in a sustainable society through discovery and innovation, the quality of life of our graduates through inspiration and teaching, and the quality of life of our peers through collaboration and exchange. With a proud heritage in chemical engineering, the department seeks to break new ground in areas where molecular understanding and engineering design meet.

The PhD student will work under the guidance of Monique A. van der Veen. The van der Veen group focuses on the development of metal-organic frameworks for photocatalysis and electronics. An important component of research in the van der Veen group is the use of advanced optical spectroscopy to gain new insight into the structure and function of nanoporous materials.

Job description

The PhD position is part of a larger project in which ferroelectrics based on metal-organic frameworks will be developed. Ferroelectrics are here targeted to be used as physically flexible memories and mechanical energy harvesters. These can be used in (biocompatible) sensors for the Internet of Things. The European Research Council has awarded a prestigious ERC Starting Grant to Monique A. van der Veen for this research.

You will work in a team of experimentalists and theorists to achieve this common goal. Your specific project is experimental and focused on the development of metal-organic frameworks with desired piezoelectric properties for mechanical energy harvesting. Metal-organic frameworks (MOFs) are hybrid crystalline materials consisting of inorganic and organic building blocks. You will target different building blocks to rationally design MOFs that can convert the energy contained in mechanical vibrations (e.g. of a beating heart) into electricity. The project therefore involves material synthesis, material characterisation, and electronic testing on the macroscopic as well as on the microscopic scale.

Requirements

The candidate must hold a MSc. degree in Chemistry, Chemical Engineering, Materials' Science or equivalent. The candidate must have a background with synthesis (e.g. molecules or solid materials). Experience with microscopy, electronic characterisation and spectroscopy is beneficial but not required.

Conditions of employment

The TU Delft offers a customisable compensation package, a discount for health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged. An International Children's Centre offers child care and an international primary school. Dual Career Services offers support to accompanying partners. Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities.
As a PhD candidate you will be enrolled in the TU Delft Graduate School. The TU Delft Graduate School provides an inspiring research environment; an excellent team of supervisors, academic staff and a mentor; and a Doctoral Education Programme aimed at developing your transferable, discipline-related and research skills. Please visit http://graduateschool.tudelft.nl/ for more information.

Information and application

For more information about this position, please contact Monique van der Veen, phone: +31 (0)15-2786458, e-mail: m.a.vanderveen@tudelft.nl.
To apply, please e-mail a detailed CV, BSc and MSc grades list, and a letter of application to Ms. Arkesteijn, e.m.p.arkesteijn@tudelft.nl.
When applying for this position, please refer to vacancy number TNWCE17-068.

Enquiries from agencies are not appreciated.

HR EXCELLENCE IN RESEARCH

Factsheet

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Feb. 20, 2018

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TNWCE17-068

Information

For more information about this job, please contact Monique van der Veen, Assistant Professor.

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For more information about the application procedure, please contact E.M.P. Arkesteijn/Chemical Engineering.

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