Technische Universiteit
Eindhoven
University of Technology

The department of Chemical Engineering and Chemistry at Eindhoven University of Technology (TU/e) invites applications for the position of

PhD Student

Contactless and contactful boiling of controlled evaporation

Reference number: V37.2314

Eindhoven University of Technology (TU/e)

TU/e is a leading international university of technology specializing in Engineering Science & Technology. Through excellent teaching and research we contribute to progress in the technical sciences, to the development of technological innovations, and as a result to the growth of prosperity and welfare in the region and beyond. TU/e maintains close links with industry, healthcare and the building and logistics sectors.

Department of Chemical Engineering and Chemistry

The Department of Chemical Engineering and Chemistry provides academic education and research at the highest international standards. Staff develop technology and scientific knowledge, thereby meeting long-term societal needs. Scientific curiosity and new insights in the department's field are the points of departure for constant improvement of its three areas of expertise: molecular technology, materials technology and process technology. The department was founded in 1957, and has some 500 staff members, 13 full-time professors, 370 Bachelor's and Master's students, 20 Post-Master's students and 170 doctoral candidates.

Project description

The vacant position is in the sub-group Interfaces with Mass Transfer (sim) from the research group Chemical Reactor Engineering (SCR) at the department of Chemical Engineering and Chemistry. The group aims to perform high-quality scientific and technological research in the chemical reactor engineering sciences with specific emphasis on the design, development and operation of structured multiphase reactors and rotating/spinning disc reactors. The research focuses on understanding and controlling the interaction of physical transport and reaction processes at all relevant time and length scales in the realization and testing of these chemical reactors for a wide range of applications and processes. The group's mission is to be among the world's top academic research groups in its field and to be leading in the development of novel technologies for new, highly efficient, inherently safe, and robust structured multiphase processing systems, which show the best productivity by a dedicated design of all relevant dimensions and optimum choice of dedicated operational procedures.

Project background

The processes of Chemical Vapor Deposition and Atomic Layer Deposition are vital for the fabrication of e.g. computer chips and solar cells. In both processes, fluids need to be evaporated with a chemical composition that becomes unstable above a certain temperature. This temperature can only be avoided by keeping the operating pressure and therefore the pressure drop low in the miniature evaporator. With new so-called contactless boiling techniques this can be achieved. In contactful boiling, on the other hand, the liquid rises through a porous wall by capillarity and evaporates on top in a gas flow passing by. Because of the complementary character of contactless and contactful boiling, both are studied in the present project.

In this project, funded by the Dutch Technology Foundation and a consortium of national and international industries, three PhD students and a post-doc will collaborate to study boiling and evaporation in miniature ducts. One of the PhD students will carry out experiments with advanced measuring techniques in two test set-ups, while two other PhD students will focus on numerical modeling. The present vacancy concerns the experimental work.

The main tasks of the experimental PhD student will be the development of two test set-ups, the further development of measuring techniques, performing validation experiments, analysis of data and assessment of scaling rules.

Job requirements

We are looking for a candidate with an MSc-degree in Applied Physics, Mechanical Engineering, Aerospace Engineering, Process Technology or equivalent with a strong interest and preferably experience in experimentation. Creativity and a strong drive to physically explain phenomena are important. The candidate should have excellent communication skills in English and good cooperative skills and should be capable and willing to work in a multidisciplinary team together with theoreticians. Drive, initiative and self-reliance are important qualities as well.

Conditions of employment

We offer a challenging job for four years in a highly motivated team at a dynamic and ambitious University. You will work with innovative analytic equipment and will be part of a highly profiled multidisciplinary collaboration where expertise of a variety of disciplines comes together. The TU/e is located in one of the smartest regions of the world and part of the European technology hotspot 'Brainport Eindhoven'; well-known because of many high-tech industries and start-ups.

The gross monthly salary in accordance with the Collective Labor Agreement of the Dutch Universities (CAO NU), starts with € 2174,- in the first year to € 2779,- in the fourth year. Besides this the TU/e has holiday- and end-of the year allowances, an excellent package of attractive benefits for employees and a modern sports complex. Assistance for finding accommodation can be given.

Information

More information about the project can be obtained with:

Dr. C.W.M. van der Geld – daily supervisor (email: c.w.m.v.d.geld@tue.nl); Prof.dr. J.G.M. Kuerten (email: j.g.m.kuerten@tue.nl, or Prof.dr. J.A.M. Kuipers (email: j.a.m.kuipers@tue.nl). Personnel information can be obtained from Mrs. L.J.C. van den Boomen, HR Advisor, email: l.j.c.v.d.boomen@tue.nl.

Application

Please upload your application **before April 1, 2016** (*consisting of a brief letter explaining/motivating your interest in the position, a detailed Curriculum Vitae, including a list of publications (if appropriate); a complete list of courses taken and grades obtained (including transcripts of academic records); one-page summary of the MSc thesis; contact details of two referees; any other relevant information*) at http://jobs.tue.nl/en/vacancy/phd-student-contactless-and-contactful-boiling-of-controlled-evaporation-223116.html via the **apply-now** button.

Only complete applications will be considered.