

N₂OMan

DOCTORAL AND POSTDOCTORAL POSITION: BIOGEOCHEMISTRY and CONTROL OF BIOLOGICAL NITROUS OXIDE PRODUCTION

The Department of Environmental Engineering at the Technical University of Denmark (DTU) invites applications for one doctoral and one postdoctoral fellowship position to help unravel the environmental and biochemical mechanisms and controls of N₂O dynamics during biological wastewater treatment. Laughing gas (N₂O) is a greenhouse gas 300 times stronger than CO₂ and a dominant ozone destroying chemical. Biological processes - the same that are essential for removing polluting reactive nitrogen from wastewaters - are potential sources of N₂O.

The topic of the **doctoral position** is, in collaboration with others, (1) to use mathematical modeling to identify targeted experiments with the aim to track and quantify the mechanisms of N₂O transformation in N cycling communities, and (2) to conduct experiments using ¹⁵N and ¹⁸O stable isotope enrichments and mass spectrometry in combination with novel on-line sensor technologies at lab-scale and pilot-scale. Emphasis will also be on the quantitative evaluation of rate-controlling parameters on N₂O dynamics.

The topic of the **postdoctoral position** is to develop and implement molecular ecological approaches (including meta-genomic and meta-transcriptomic methods) to examine pathway expressions in natural and synthetic N cycling communities – under dynamic and steady operation conditions. The postdoctoral researcher will work in close collaboration with the PhD student and other researchers with biogeochemical expertise (including stable isotope based (¹⁵N, ¹⁸O) methods). The ultimate goal of this joint work is to trace and quantify the expression and control of pathway governing N₂O production.

The team will focus on synthetic and open microbial communities that can be found in various biological nutrient removal processes, with a special interest in those performing autotrophic N removal.

For further information on the project, visit the preliminary homepage ([N₂OMan](#)).

Skills and Qualifications

The successful applicant for the doctoral position will have a strong training and interest in one or more of the following fields: Biogeochemistry, Environmental Biochemistry, Microbial Ecology, Bioreactor/Bioprocess Technology, Inorganic Chemistry, with evidence of experience in the use of stable isotopes, bioreactor operation, or microsensor application. The candidate will have a high motivation for research, evidence of solid written and oral communication skills, and enjoys working in an international and cross-disciplinary team. At the time of appointment, the candidate should have M.Sc. degree in Environmental Sciences, Biology, Microbial Ecology, Biochemical, or Chemical Engineering or related discipline.

The successful applicant for the postdoctoral position should have a Ph.D. degree (or equivalent) in Molecular Microbial Ecology, Molecular Biology, Systems Microbiology or related discipline, with a strong background in Molecular Ecological Techniques and Bioinformatic Analysis. The candidate will demonstrate evidence of prior research productivity, including a quality publication record, excellent collaboration and communication skills, an interest in working in an interdisciplinary research environment, and a strong work ethic and motivation to succeed within a competitive research field.

What we offer

The candidates will join an interdisciplinary team of researchers (supported by this and other grants) who have the overall aim to elucidate and ultimately control N₂O dynamics in bioengineered systems for N removal from residual waters. This team consists of environmental microbiologists, microbial ecologists, biogeochemists, environmental engineers, biological process modelers, and process control engineers,

Research groups from DTU and the Southern University of Denmark (SDU) in addition to an international research group (Max Planck Institute for Marine Microbiology in Germany), and several private and public partners from DK and SE are involved. The overall focus of the research cluster is to gain an in-depth know-how on the pathways involved in N₂O production and their expression dynamics – a need to support the development of management strategies to ensure that WWTPs control their nitrogen (N) load to both the atmosphere and the aquatic environment.

The Technical University of Denmark is ranked as one of the foremost technical universities in Europe, located just north of Copenhagen, the capital of DK. The Department of Environmental Engineering offers state-of-the-art chemical, microbial and molecular analytical facilities, process laboratories and equipment to execute the projects.

Assessment

The assessment of the applicants will be made by an assessment committee chaired by Prof. Barth F Smets.

Salary and Terms of Employment

The PhD fellow will be employed in accordance with the agreement on salaried PhD scholars between the Ministry of Finance and AC (The Danish Confederation of Professional Associations). Admission to the PhD degree is subject to academic approval. For general requirements for enrollment and planning of the PhD studies, please see the [DTU PhD Guide](#).

The appointment *Post-doctoral fellowship* is based on a collective agreement with the Confederation of Professional Associations. The actual allowance will be agreed with the relevant union.

Employment conditions for both positions include comprehensive health-care and social security provisions.

The positions are available as of January 1st 2014. The period of employment is 3 years each and is supported by a research grant from The Danish Council for Independent Research | Technology and Production Sciences (FTP). The positions will be based in pthe DTU Lyngby Campus, Denmark.

Further information

For further information, please contact Prof. Barth F. Smets (bfsm@env.dtu.dk). Please do not send applications to this email address, but apply online using the electronic submission system.

Application procedure

Your online application must be submitted no later than Jan 15, 2014.

This ad and link to the online application link can be here: <http://www.dtu.dk/Job>

Applications must be submitted as **one PDF file** containing all materials to be given consideration. To apply, open the link "Apply online," fill in the online application form, and attach **all your materials in English in one PDF file**.

The application must include the following:

- A cover letter stating your specific interest, motivation and qualifications for the project in question (max. two pages)
- A curriculum vitae including relevant information on previous employment, research training, experience and competencies, teaching experience, scientific publications, conference presentations, and personal contact information
- For PhD candidates: Authorized copies of BSc and MSc degree diplomas, including transcript of grades. Excel sheet with translation of grades to the Danish grading system (see guidelines and excel spreadsheet [here](#)). Copies of master thesis or coauthored scientific publications.
- For postdoctoral candidates: Authorized copy of BSc, MSc, and PhD diplomas. Copies of at least 2 relevant authored/coauthored Scientific Publications

- Documentation of English language competency.

The selection will be based on a two-step application process. In a first step, all applications will be reviewed to generate a short list of candidates. Potential candidates will be invited for a personal on-site interview. The position starting date is subject to mutual agreement.

All interested candidates irrespective of age, gender, religious affiliation, or ethnic background are encouraged to apply.

DTU is a technical university providing internationally leading research, education, innovation and public service. Our staff of 5,000 advance science and technology to create innovative solutions that meet the demands of society; and our 9,000 students are educated to address the technological challenges of the future. DTU is an independent academic university collaborating globally with business, industry, government, and public agencies.