Scanning Probe Microscopy Expert (Postdoctoral Fellow or Research Associate) CO₂ conversion to solids: Increase sustainability by transforming waste building materials to new, valuable products

Technical University of Denmark

From fundamental understanding of the interactions of water and gas with natural materials, we are developing a fast, cheap, environmentally friendly way to mineralise CO₂, to make it stable for millennia. We are building a cross disciplinary team of students and scientists and searching for enthusiastic members.

The Research

As a result of recently funded projects, we are building a cross disciplinary research group. We are looking for a scanning probe microscopy expert(AFM and the like) at Postdoctoral Fellow or Research Associate level.

The goal is to develop a local method for mineralising CO_2 . Even with the very best alternative energy sources and conversion of CO_2 into products, current air and ocean CO_2 levels will need 1,000 to 10,000 years to return to preindustrial levels. To reduce climate change and ocean acidification, CO_2 must be converted to solid and put back into the Earth, where it came from in the first place.

At DTU Physics, we are running several projects in parallel, that range from very fundamental investigations of mineral-water-gas properties, through developing predictive models and new experimental methods and instrumentation, to applying research results and designing industrial CO₂ trapping processes. The need is urgent, the task is challenging and a multidisciplinary approach is essential - so our highly motivated team includesstudents and senior scientists: chemists, physicists, nanoscientists, materials scientists, mineralogists, geoscientists, engineers and others.

The job

As the Scanning Probe Microscopy expert, we expect you to know of, and can use, some of: atomic force microscopy, chemical force microscopy, adhesion force mapping, infrared atomic force microscopy and some of the other possible physical property data collection modes. You have a quantitative science or engineering background and you will contribute in a cross disciplinary team, to understand solid-fluid (water and gas) interactions with natural materials and the effect of organic compounds on them. The team will merge data from traditional techniques with results from state-of-the-art, ultrahigh resolution instrumentsand modelling at scales ranging from atoms to meters. Our goals are to gain very fundamental, new knowledge about how nature works and to apply it in a reactor, to convertCO₂and waste building materials to a valuable product for use in new, low CO₂construction.

Our expectations of you

We are looking for a curious, enthusiasticcolleague who has an interest in nature, enjoys solving problems and working together, to meet the projects' goals. We expect you to have a PhD, deep experience with scanning probe microscopy and a solid background in physics or chemistry.

Flexibility is essential. We are looking for a team player who can also work independently, who is motivated to help make, and be part of, a dynamic research environment and who has a positive, supportive and creative outlook. We expect you to have good communication and personal

interaction skills and to be fluent in English.

We offer

DTU is among the leading technical universities of Europe and the top in the Nordic countries. The CO₂ projects we plan will unite researchers from several DTU departments as well as national and international researchers from a number of fields. The atmosphere in the research group is friendly and supportive, allowing us to produce ground breaking results, of interest to science and essential for industry. Our mission is to derive new fundamental understanding and use it to solve society's problems.

Salary and appointment terms

Appointment will be based on the collective agreement with the Danish Confederation of Professional Associations. Salary will be determined by the applicant's qualifications and in agreement with the relevant union.

The position is full time. It starts as soon as possible and is for 2 years, with potential for renewal. The workplace is the DTU Lyngby Campus.

Application and contact

Please submit your online application no later than **Thursday**, **16 November 2023**, **noon(Danish time)**.

Open the "Apply online" link on the Danish Technical University (DTU) jobs web page. Fill out the form and attach:

- a cover letter (1 or 2 pages) describing how are perfect for the position, using your background as examples; include a few words about your perspectives on teaching and research,

- your CV, including employment history, research and teaching experience, scientific highlights, ORCID identifier and other relevant information about you as a scientist and a person,

- publication list in proper reference list format; mark as many as 5 papers that you consider to represent your best work and write 2 or 3 lines for each of these, describing why you chose them (*do* **not** include the actual papers in your application).

- your course lists and grades from your BSc and MSc education,

- name, email and phone number for 3 personal references (do not include letters of reference).

Further information can be obtained from Prof. Susan Stipp, stipp@dtu.dk.

Applications sent by email or submitted online after the deadline cannot be considered. Applications must be made through the official submission site.

All interested candidates, irrespective of age, gender, race, disability, religion and ethnic background are encouraged to apply.

Technology for people

DTU develops technology for people. With our international elite research and study programmes, we are helping to create a better world and to solve the global challenges formulated in the UN's 17 Sustainable Development Goals. Hans Christian Ørsted founded DTU in 1829 with a clear vision to develop and create value using science and engineering to benefit society. That vision lives on today. DTU has 13,400 students and 5,800 employees. We work in an international atmosphere and have an inclusive, evolving, and informal working environment. DTU has campuses in all parts of Denmark and in Greenland and we collaborate with the best universities around the world.