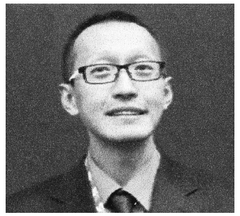

Associate Professor

HAO HU

Department of Photonics

Technical University of Denmark

GRANTED DKK 10M

Energy-efficient optical communications at 2 micron beyond capacity crunch

Optical communications is the backbone of our information society; however, currently optical fiber transmission at conventional band is approaching the capacity limit. This project will explore optical communications at 2 um terra incognita and explore novel ways of using photonic chips for large-capacity energy-efficient optical communications at 2 um beyond the 'capacity crunch'. The grant will allow the recruitment of three PhD students, one postdoc and purchasing of new equipment.

Associate Professor

STEFAN KRAGH NIELSEN

Department of Physics

Technical University of Denmark

GRANTED DKK 7.8M

Will the three-wave interaction prevent the fusion dream?

Fusion energy holds the potential to power the Earth with virtually unlimited clean energy. While fusion energy successfully powers the Sun, the fusion energy produced on Earth is still below the heating energy needed to drive the fusion reaction. This project will address how to optimize heating efficiency of fusion plasmas by characterizing the interaction between the heating beams and the fusion fuel. The grant will provide funding for two PhD students, one postdoc and experimental equipment.

Associate Professor

THOMAS JUST SØRENSEN

Department of Chemistry

University of Copenhagen

GRANTED DKK 10M

Exploring the unique chemistry of lanthanide ions

This research project will study the molecular structure surrounding lanthanide ions in solution. Lanthanide ions have many unique properties, one is that they emit light, a fact we benefit from when turning on an energy saving fluorescent light. The project will test the structure-property relationship that we develop by trying to improve rare earth mining, nuclear fuel recycling, and lanthanide based diagnostic tools. The grant funds three PhD students, two postdocs and a new spectrometer.

Assistant Professor

FERNANDO GEU-FLORES

Department of Plant and Environmental Sciences

University of Copenhagen

GRANTED DKK 10M

Towards sustainable protein sources for Europe: Biosynthesis and transport of the lupin alkaloids

Lupins are protein crops with great potential to address the EU's dependency on protein imports. However, the presence of toxic alkaloids in their beans has limited their use as food and feed crops. In this project, two postdocs and one PhD student will uncover how these alkaloids are made and moved around within lupin plants. The project will set the stage for the creation of insect-resistant lupin varieties that accumulate alkaloids of industrial relevance yet produce alkaloid-free beans.

2017 VILLUM YOUNG INVESTIGATORS

Assistant Professor

KIRSTEN MARIE ØRNSBJERG JENSEN

Department of Chemistry

University of Copenhagen

GRANTED DKK 10M

Structural characterization of inorganic nanoclusters: Materials chemistry between molecules and solids

When going to the ultra-small nanoscale, many compounds drastically change their properties, opening for the development of new materials for energy storage and conversion. To take advantage of this, it is crucial to understand the relation between atomic structure, material synthesis and material properties. We will use advanced X-ray scattering methods to study this relation in new, ultra-small nanomaterials. The grant funds three PhD students, one postdoc and a new X-ray diffractometer.

Assistant Professor

KNUD ANDREAS JØNSSON

Natural History Museum of Denmark

University of Copenhagen

GRANTED DKK 10M

Dispersal, differentiation and speciation in island bird communities

The bewildering diversity and distribution of life around us have puzzled scientists for centuries. This project will determine how populations of birds disperse, differentiate, speciate and adapt to form the communities we observe on Earth. Understanding the processes driving biodiversity is of crucial importance for assessing the effects of global change on the diversity of life on Earth. The grant will fund two PhD students, fieldwork, DNA sequencing and satellite transmitters.

Assistant Professor

MADS ALBERTSEN

Department of Chemistry and Bioscience

Aalborg University

GRANTED DKK 10M

Deciphering the role of microbial dark matter by novel DNA sequencing approaches

Microbial communities underpin all processes in the environment and directly impact human health. Despite their importance, only a tiny fraction of the microbes is known. This is mainly due to difficulties of cultivating microbes from natural systems in the laboratory. This project will develop novel DNA sequencing approaches to enable recovery of microbial genomes from natural systems. The grant will partly fund the applicant and allow recruitment of two PhD students and one postdoc.

Postdoc

ANA SOFIA REBOLEIRA

Natural History Museum of Denmark

University of Copenhagen

GRANTED DKK 7M

HiddenRisk – understanding the impact of human activities on subterranean biodiversity

The lack of light in the subterranean environment gives rise to a peculiar ecosystem composed of species with unique adaptations. This project investigates the impact of anthropogenic disturbance in subterranean ecosystems, providing the first global perspective of how human activities are affecting the largely unknown and extremely fragile subterranean biodiversity of our planet. The grant will allow the recruitment of one PhD student, one postdoc and purchasing of new equipment.

Postdoc

JACOB LEWIS BOURJAILY

Niels Bohr Institute

University of Copenhagen

GRANTED DKK 7.4 M

Breaking barriers in scattering amplitudes: Understanding via computation (and vice versa)
This project aims to change the way that we understand and use quantum field theory to make predictions for experiments - such as scattering amplitudes. For these predictions, the traditional methods are no longer used by experts. This project will advance the revolution in our understanding by extending the reach of powerful new frameworks to more general theories. The grant will support the recruitment of two postdocs and one PhD student to contribute to these developments.

Postdoc

KASPER STEEN PEDERSEN

Department of Chemistry

Technical University of Denmark

GRANTED DKK 8.6M

Advancing 2D materials by chemical engineering
Two-dimensional (2D) materials offer a wealth of extraordinary properties, which are unparalleled in the 3D world and are key for meeting the compelling demand for higher performance electronics and spintronics. This project will develop new approaches to 2D materials using synthetic assembly of molecular building blocks, which provides chemical encoding of specific material functionalities. The grant will finance the recipient, one postdoc, two PhD students, and equipment.

Postdoc

KENNETH AGERLIN HALBERG

Department of Biology

University of Copenhagen

GRANTED DKK 8.5M

Novel molecular targets for beetle pest control - from genome to phenome
One of the biggest challenges of the 21st century is to provide food security for the growing global population. Beetle pest control is key to food security, yet traditional chemical control is harmful to both humans and the environment. This project will explore the potential of using rationally designed hormone-like compounds as a novel and eco-friendly pest control solution. The grant will allow the recruitment of one postdoc and one PhD student, as well as the purchase of new equipment.

Postdoc

NICOLE POSTH

Department of Biology

University of Southern Denmark

GRANTED DKK 9.7M

Cycling in the "plastisphere": The biogeochemical fate of marine (micro) plastic
Marine plastic debris is a global challenge that poses risk to environmental health, maritime economy and carbon cycling. The presence of biofilm on marine plastic implies a new ecological niche, called the "plastisphere". This project will study whether microbes degrade, transport and incorporate (micro)plastic into biogeochemical cycles to determine the fate of plastic waste in the marine environment. The grant will fund a postdoc, a PhD and a technician, as well as fieldwork and advanced biofilm imaging.

2017 VILLUM YOUNG INVESTIGATORS

Postdoc

SOPHIE BEEREN

Department of Chemistry

Technical University of Denmark

GRANTED DKK 10M

Non-natural selection of carbohydrate-based receptors
Carbohydrates play vital roles in biological systems but our ability to study them is currently limited by a lack of efficient methods for their synthesis. This project aims to develop a new biotechnological approach for the synthesis of carbohydrate oligomers using template molecules to select products from enzymatic reactions that would not naturally be produced. The grant supports the research for 5 years and recruitment of two PhD students and two postdocs.

Postdoc

SØREN HAUBERG

Department of Applied Mathematics and Computer Science

Technical University of Denmark

GRANTED DKK 9.7M

Measuring with no tape
At the heart of most statistical calculations is a distance measure used to determine the similarity between different observations. Surprisingly often, a suitable distance measure is not known up front but is estimated from the given data. The inherent uncertainty of data, however, implies that the estimated measure is also uncertain, which raises several unsolved problems. The grant will allow the recruitment of three PhD students, five years of postdoc work and key data collection.

Postdoc

SØREN ULSTRUP

Science and Technology

Aarhus University

GRANTED DKK 10M

Electronic structure up-close with photoemission at the nanoscale
Miniaturization of electronics has paved the way for device architectures with nanoscale material interfaces. This project seeks a complete understanding of the quantum mechanical properties that dictate the operation of such devices. The project will accomplish this by constructing a new experimental facility at the synchrotron light source ASTRID2 in Aarhus that utilizes photoemission spectroscopy with nanoscale spatial resolution. The grant allows recruitment of one postdoc, one PhD student and purchasing of equipment.

Postdoc

VIVI KATHRINE PEDERSEN

Department of Geoscience

Aarhus University

GRANTED DKK 7.5M

The influence of Earth surface processes on Scandinavian ice sheet evolution and collapse
Predictions of past and future sea level are associated with significant uncertainties. For instance, the influence of fjord formation on ice sheet dynamics and sea level remains unexplored. This project will combine sea level and ice sheet modelling with empirically constrained erosion rates. This will quantify interactions between surface processes, the solid Earth, ice sheets and sea level, exemplified by the former Scandinavian ice sheet. The grant will fund two postdocs.