Summer School 2017

“Aerobiology: microbiology meets atmospheric sciences”

The Department of Bioscience in collaboration with the Department of Chemistry, Stellar Astrophysics Centre at the Department of Physics and Astronomy, Department of Environmental science, Department of Engineering, and Department of public health at Aarhus University is pleased to announce the PhD summer school “Atmospheric microbiology: at the intersection of microbial ecology and atmospheric sciences”, which will take place at Aarhus University, June 19-30, 2017.
Time
19th to 30th of June 2017

Location
Aarhus University, Aarhus, Denmark

Overview
Primary biological aerosol particles (PBAP) have been widely recognized as a main aerosol species in the troposphere, with far-reaching implications for atmospheric chemistry and physics, biogeography, epidemiology, and meteorology. Study of PBAP relies on a combination of disciplines, which will be introduced during the summer school. The school will cover: (1) the interrelations between PBAP and the processes of cloud formation, precipitation development, as well as chemical processing in the atmosphere; (2) health and environmental effects of PBAP; (3) microbial physiology in the atmosphere and it’s relevance for microbial dispersal and biogeography. Participants will gain both theoretical and hands-on experience for studying these topics using a range of techniques and instruments. Finally, there will be opportunities to discuss the challenges facing researchers in the field.

Audience
This course is aimed at natural scientists, i.e. microbiologists, physicists, chemists, meteorologists, modellers, environmental scientists, medical students, who are interested or already working in aerobiology-related fields.

Pre-course activities
There will be some reading required in advance of the course, so that all participants will start with a basic understanding of the field.

Syllabus, tools and resources
During this summer school you will learn about:
   1. Bioaerosol generation in the laboratory: SLAG, TSI atomizer, bubble tank
   2. Bioaerosol collections by diverse complementary methods: impingers, filter collectors, impactors
   3. Online analysis of (bio)aerosols in the laboratory and in the environment: Biotrak, APS, SMPS, CCNe
   4. Offline analysis of (bio)aerosols: ice nucleation assays, flow cytometry, nuclear acids extraction and qPCR

Credits
5 ECTS, University of Aarhus (no grades – only Pass or Fail)

Exam and assessment
Students write a scientific report based on the results of their project work.

How to apply
Applicants must register for the course before the April 24th 2017 by submitting a short biography including their work history and a description of their current research interests and how these relate to the summer school. The document should be no longer than 300 words. Send the application to temkiv@phys.au.dk.
Registration fee
400 € which is inclusive of lunch and refreshments, course dinner, course materials, and the excursion.

Travel grants
We have the opportunity to offer travel grants (300 €), which can be used to cover travel expenses and housing in Aarhus. Please apply for a travel grant by sending an application to temkiv@phys.au.dk before April 24th and you will receive the decision by May 8th. Applications should contain: name, affiliation to a research institution, email address, supportive statement from current supervisor, and a personal statement.

Accommodation
With its 330,000 inhabitants, Aarhus is the second largest city in Denmark, situated on a wonderful coastline of the Jutland peninsula. In 2017 Aarhus is hosting the European Capital of Culture, with the encompassing theme RETHINK and numerous events taking place throughout the year. As Aarhus will be very busy during the summer, in particular due to all the cultural activities, the hotels will be occupied and therefore we will encourage booking your rooms soon as possible.

Information and questions
You can find more information here: http://sac.au.dk/currently/aerobiology-summer-school-19-30-june-2017/. If you have any question concerning the course please do not hesitate to contact Tina Santl-Temkiv (temkiv@phys.au.dk).
Preliminary program

Aerosols, clouds and ice nucleation

Merete Bilde, Professor
Department of Chemistry, AU
“Aerosols: occurrence and transformations”

Merete Bilde, Professor
Department of Chemistry, AU
“Aerosols and cloud processes”

Tina Šantl-Temkiv, Assistant professor
Department of Bioscience, AU
Department of Physics and Astronomy, Stellar Astrophysics Centre, AU
“Biological ice nucleation”

Thomas Boesen, Associate professor
Department of Molecular Biology and Genetics, AU
“Molecular basis of bacterial ice nucleation”

Atmospheric chemistry, climate, and the Artic

Marianne Glasius, Associate professor
Department of Chemistry, AU
“Introduction to atmospheric chemistry”

Tina Šantl-Temkiv, Assistant professor
Department of Bioscience, AU
Department of Physics and Astronomy, Stellar Astrophysics Centre, AU
“Aerobic microorganisms and atmospheric chemistry”

Marianne Glasius, Associate professor
Department of Chemistry, AU
“Climate effects of gases and particles”

Andreas Massling, Senior researcher
Department of Environmental Science, AU
Department of Bioscience, Arctic Research Centre, AU
“Aerosols and climate effects in the arctic”

Maher Sahyoun, Postdoctoral fellow
Université Blaise Pascal
“Impact of bio-aerosols on cloud microphysics, modelling perspectives”

Marine and freshwater aerosols

Matthew Salter, Researcher
Department of Environmental Science and Analytical Chemistry, Stockholm University
“The role of sea surface microlayer”

Matthew Salter, Researcher
Department of Environmental Science and Analytical Chemistry, Stockholm University
“Aerosolization of bioaerosols through the process of bubble bursting”

Manuel Dall’Osto, Scientist
Department of Marine Biology and Oceanography, The Institute of Marine Sciences, Spanish National Research Council
TBA

Manuel Dall’Osto, Scientist
Department of Marine Biology and Oceanography, The Institute of Marine Sciences, Spanish National Research Council
Sylvie Tesson, Postdoctoral fellow
Department of Biology, Lund University
TBA

**Anthropogenic aerosols and health effects**

Jakob Löndahl, Associate professor
Department of Design Sciences, Faculty of Engineering, Lund University
“Emissions, transport and deposition of biological particles in the air”

Jakob Löndahl, Associate professor
Department of Design Sciences, Faculty of Engineering, Lund University
“Transmission of Airborne disease”

Yulia Olsen, PhD student
Department of Public Health, AU
“Health aspects of mold spores in air”

Torben Sigsgaard, Professor
Department of Public Health, AU
“Health effects of aerosols”

Niels Bohse Hendriksen, Senior researcher
Department of Environmental Science, AU
TBA

**Technical aspects: collecting and analysing**

Ulrich Bay Gosewinkel, Senior researcher
Department of Environmental Science, AU
“Sampling bioaerosols: ground based and aircraft based methods”

Ian Marshall, Postdoctoral fellow
Department of Bioscience, AU
TBA

**Microbial ecology of the atmosphere**

Kasper Urup Kjeldsen, Associate professor
Department of Bioscience, AU
“Microbial dispersal and biogeography”

Tina Šantl-Temkiv, Assistant Professor
Department of Bioscience, AU
Department of Physics and Astronomy, Stellar Astrophysics Centre, AU
“Atmospheric stress and microbial adaptations”

Kai Finster, Professor
Department of Bioscience, AU
“Colonization of new environments”