

**FWF**

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**Doktoratskolleg  
-PhD program-**

**Microbial Nitrogen Cycling – From Single Cells to  
Ecosystems**

University of Vienna, Faculty of Life Sciences



**Kickoff meeting 29/30 June 2016**

**Location:** KLI Klosterneuburg, Martinstraße 12, A-3400, Klosterneuburg

**Participants:** DK+ Faculty and associates, DK+ students and associated DK+ students

Invited speakers, interested guests

Lectures on the first day will be open for guests from other universities, research centers and schools

## Program Day 1

June 29	
13:00	Lunch
14:00-14:30	<p><b>Johannes Jäger</b> Scientific director of KLI</p> <p><i>Welcome to KLI</i></p> <p><b>Christa Schleper</b> Department of Ecogenomics and Systems Biology, University of Vienna Speaker of PhD program</p> <p><i>Presentation of the DK+ structure and goals</i></p>
14:30-14:40	<p><b>Melina Kerou</b> Scientific Coordinator of the PhD program</p> <p><i>Hiring procedure and statistics</i></p>
14:40-15:40	<p><b>Lisa Stein</b> Professor of Biological Sciences, University of Alberta, Canada</p> <p><i>"NO way to Nitrous Oxide Production by Ammonia-Oxidizers"</i> open lecture</p>
15:40-16:10	Coffee Break
16:10-17:10	<p><b>Jan Erisman</b> Professor of Integrated Nitrogen Studies, VU University of Amsterdam, CEO of Louis Bolk Institute</p> <p><i>"Nitrogen: too much of a vital resource"</i> open lecture</p>
17:10-17:40	<p>DK+ faculty:</p> <p><b>Silvia Bulgheresi</b> Division of Archaea Biology and Ecogenomics</p> <p><b>Stefanie Wienkoop</b> Division of Molecular Systems Biology</p> <p><i>15 min talks, introducing N-cycle research at the University of Vienna by faculty of the PhD programme</i></p>
17:40-19:10	Poster Session of the DK students with wine and cheese / Tour of the KLI
19:30	Dinner at Heurigen

## Program Day 2

June 30	
9:00-10:15	<p>DK+ faculty:</p> <p><b>Andreas Richter</b> Division of Terrestrial Ecosystem Research</p> <p><b>Dagmar Woebken</b> Division of Microbial Ecology</p> <p><b>Holger Daims</b> Division of Microbial Ecology</p> <p><b>Thomas Rattei</b> Division of Computational Systems Biology</p> <p><i>15 min talks, introducing N-cycle research at the University of Vienna by faculty of the PhD programme</i></p>
10:15-10:45	Coffee break
10:45-11:15	<p><b>Wilfried Winiwarter</b> European Director of the International Nitrogen Initiative Senior Research Scholar at the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria</p> <p><i>"The International Nitrogen Initiative - policy relevant research on environmental impacts of nitrogen compounds"</i></p>
11:15-12:00	<p>DK+ faculty:</p> <p><b>Gerhard Herndl</b> Division of Marine Biology</p> <p><b>Christa Schleper</b> Division of Archaea Biology and Ecogenomics</p> <p><b>Michael Wagner</b> Division of Microbial Ecology</p> <p><i>15 min talks, introducing N-cycle research at the University of Vienna by faculty of the PhD programme</i></p>
12:00-13:00	Lunch End of meeting
13:00-ca. 14:30	DK+ Round table (students only)



**Lisa Stein**

Professor of Biological Sciences, University of Alberta, Canada

*“NO way to Nitrous Oxide Production by Ammonia-Oxidizers”*

Nitrous oxide is a critical greenhouse gas that continues to increase in the atmosphere, yet the microbial pathways and processes that control its production are still largely uncharacterized. Aside from heterotrophic denitrifiers, ammonia-oxidizing bacteria and Thaumarchaea are implicated as major producers of  $N_2O$ . Our comparative studies of ammonia-oxidizing bacteria and Thaumarchaea revealed several interesting insights to  $N_2O$  production including essential and non-essential enzymology, metabolic intermediates, and interactions between biotic and abiotic processes. This work places NO as a key molecule that ammonia-oxidizers produce and use in a surprising variety of physiological contexts to ultimately produce  $N_2O$ .



**Jan Erisman**

Professor of Integrated Nitrogen Studies, VU University of Amsterdam, CEO of Louis Bolk Institute

*“Nitrogen: too much of a vital resource”*

Human modification of the nitrogen cycle is one of the central global ignored challenges affecting human health, ecosystem integrity and biodiversity. The planetary boundary for nitrogen has been breached by a factor two, making nitrogen one of the most urgent pressures on the earth system. Excess nitrogen originating from chemical fertilizers, animal manure and burning of fossil fuels, are increasingly affecting soil, water and air quality. However, nitrogen also plays an important role in food security. The human creation of chemical nitrogen fertilizer has enabled the production of more food and a change to more protein rich diets. It has been estimated that without chemical nitrogen fertilizer, only half of the people would have enough food given current diets and agricultural practices. I will present an overview of the nitrogen challenge and also explores options to decrease the negative impacts of excess nitrogen on biodiversity and ecosystems, while at the same time providing food security to a growing world population.



**Faculty members of PhD program N-cycle**