The 26th European Nitrogen Cycle Meeting
Microbial Nitrogen Transformations Across Scales
September 13-15, 2023
Oslo, Norway

MEETING REPORT

The European Nitrogen Cycle (ENC) meeting is an annual event that joins research groups in Europe with long-lasting and complementary expertise on several aspects of this microbially driven biogeochemical cycle. The 2023 Oslo edition was hosted by the Norwegian University of Life Sciences' (NMBU) Nitrogen Group and placed a special emphasis on microbial nitrogen transformations across scales with a stressing importance on scientific and societal challenges. The meeting attracted 66 participants – including 30 early career scientists – from 20 institutions across Europe.

Meeting Overview:

The meeting took place over three days at two different locations. On the first day, the meeting was held at the NMBU campus and started with demonstrative tours of NMBU's unique laboratory robotized incubation systems for real-time monitoring of gas kinetics in microbial batch cultures and the field robot for automated high-resolution measurements of N_2O and CO_2. This was then followed by five 'satellite sessions' that continued further discussions on the handling of gas kinetic data sets, anaerobic high cell density culturing, ^{15}N-tracing in the field, gas flux emissions from the field robot, and emulsion culturing and flow cytometry. Following the lab and field demonstrations, we had our opening and first session of the day, which included seven flash poster presentations and two talks from Keynote speakers. The second and third day of the meeting were held at the Oslo Science Park (Forskningsparken) in Oslo. The second day consisted of four individual sessions with two Keynote speakers and 15 oral presentations, whereas the third day consisted of one session with three Keynote speakers and 13 oral presentations, one poster session with 17 posters, and a closing session with one Keynote speaker.

In addition to scientific content, three social/networking events were organized: a 'kick-off' welcome reception on Wednesday evening, a choice of excursion following the last session on Thursday (choice of either a guided historic river walk in Oslo or guided tour of the Oslo Opera House), and a social gathering on Thursday evening.

Sessions and Keynote Speakers:

In total, there were eight thematic sessions consisting of an opening and closing lecture and topics pertaining to the nitrogen cycle at the ecosystem level, microbial nitrogen transformations in aquatic systems and sediments, microbial nitrogen transformations in soil, microbial nitrogen transformations and field emissions, environmental biotechnology, and the enzymology and physiology of the nitrogen cycle.

The meeting showcased eight Keynote speakers:

1. **Lars Bakken (Norwegian University of Life Sciences)**: Opening Lecture.
2. **Klaus Butterbach-Bahl (Aarhus University)**: Land-CRAFT: Bridging N cycles – from the sites to landscapes.
3. **Hannah Marchant (Max Planck Institute for Marine Microbiology)**: Sandy sediments and their microbial inhabitants; biocatalytic filters in the Anthropocene.
4. **Mark van Loosdrecht (Delft University of Technology)**: N_2O emissions from wastewater treatments.
5. **Oliver Einsle (University of Freiburg)**: Copper delivery and metal site assembly in nitrous oxide reductase.
6. **Michael Wagner (University of Vienna)**: Growth of complete ammonia oxidizers on guanidine: from physiology to structural biology and environmental applications.
7. **Maria J. Delgado (Spanish National Research Council)**: Pathways and regulatory factors involved in NO and N_2O emissions by nitrogen-fixing endosymbiotic bacteria.
8. **Jeffrey Cole (University of Birmingham)**: Closing Lecture; Errors in Nitrogen Cycle dogma: chemistry, biochemistry, and biological relevance.

At the end of the meeting, two early career scientists were awarded for the best oral and poster presentation:

1. **Marte Maråk** (oral presentation): Optimizing denitrification-driven high cell-density cultivation for sustainable single-cell protein production: challenges and prospects.
2. **Jördis Stührenberg** (poster presentation): Urea utilization by ammonia oxidizing archaea in the Black Sea.

Funding from ISME sponsored travel grants for Keynote speakers from institutions outside of the host institution. The ISME sponsorship was acknowledged on the meeting's website, in the program and abstract booklet, and during the welcome address and concluding remarks. The 26th European Nitrogen Cycle meeting thanks ISME for their generous support.

During the meeting, it was decided that the 27th and 28th European Nitrogen Cycle Meetings will be held in Granada, Spain in 2024 and in Vienna, Austria in 2025, respectively. We look forward to seeing you there!

Meeting registration at the Norwegian University of Life Sciences (photo: Elisabeth Gautefall Hiis).

Tour of NMBU's field robot for automated high-resolution measurements of N_2O and CO_2 (photo: Elisabeth Gautefall Hiis).

Welcome address at the NMBU venue on the first day of the meeting (photo: Elisabeth Gautefall Hiis).

Scientific session at the Oslo Science Park, the venue for the second and third day of the meeting (photo: Elisabeth Gautefall Hiis).

The guided historic river walk in Oslo (photo: Elisabeth Gautefall Hiis).

The guided tour of the Oslo Opera House (photo: Else Marie Aasen).