2026 Ada Lovelace Workshop on Modelling Mantle and Lithosphere Dynamics
21–26 June 2026, Seč, Czech Republic

Organizational aspects

This workshop was the most recent meeting in a long-running series dating back to 1987 and renamed in 2018 as the Ada Lovelace Workshops on Modelling Mantle and Lithosphere Dynamics conference. Held every two years in different European countries, the workshop returned to the Czech Republic for the first time since 2003.

The workshop took place at Hotel Jezerka on the shores of Lake Seč. The location enabled participants to stay together throughout the week, promoting intensive scientific discussions and community building. The meeting was organized by Hana Čížková, Vojtěch Patočka and Ladislav Hanyk from Charles University in Prague and Petra Maierová from the Czech Geological Survey, with support from EGU GD Division represented by Laetitia Le Pourhiet and assistance of the international Scientific Committee.

The programme combined invited lectures, poster sessions, student–speaker meetings, workshops, plenary discussions, excursions and social events. A strong emphasis was placed on the participation of Early Career Scientists (ECS). Three dedicated poster sessions allowed extensive interactions among participants, and ECS researchers presented their work through short poster mini-presentations. Daily student–speaker meetings provided opportunities for informal discussions between invited speakers and younger researchers. These meetings proved highly successful in encouraging scientific exchange across career stages.

As in previous Ada Lovelace workshops, online participation was restricted to exceptional cases. One keynote lecture (Tobias Keller) was delivered remotely, while essentially all scientific interactions took place in person. The format of the workshop, with all participants living and working together throughout the week, fostered intensive discussions and strengthened ties within the international geodynamics community.

The conference website, registration system, and abstract management were hosted through the workshop infrastructure developed by the organizers and made available through the conference website: https://geo.mff.cuni.cz/alw2026.

Scientific progress

The scientific programme reflected the continuously evolving nature of numerical modelling of the mantle and lithosphere dynamics and demonstrated the increasing diversity of applications within the geodynamics community.

The first scientific day focused on lithosphere dynamics. Invited lectures covered continental rifting in a plate-tectonic framework (Susanne Buiter), lithospheric dripping across Earth and Venus (Oğuz Göğüş), interpretable machine learning approaches for geodynamic modelling (Denise Degen), coupling long-term geodynamics with dynamic rupture processes (Anthony Jourdon), and interactions between tectonics and climate-driven surface processes (Sebastian Wolf). These talks highlighted recent advances in integrating processes operating across a wide range of temporal and spatial scales.

The second day concentrated on deformation processes, fluid and melt transport, and links between short- and long-term deformation. Presentations addressed mantle melting and magma migration (Adina Pusok), multiphase flow modelling (Tobias Keller), anisotropy associated with rock texture

evolution (Agnes Kiraly), thermal runaway and strain localization (Arne Spang), and constraints from seismology on slab dynamics (Christian Sippl). Together, these contributions emphasized the growing importance of coupling geological, geophysical, and petrological processes within numerical models.

A distinctive feature of the 2026 workshop was the strong representation of planetary geodynamics. The final scientific day explored mantle evolution and tectonic processes on Earth and throughout the Solar System. Invited talks discussed self-consistent plate generation in the mantle convection models (Julian Lowman), tectonomagmatic regimes of rocky planets (Diogo Lourenço), mantle dynamics and phase transitions on Venus (Madeleine Kerr), tidal forcing and tectonics on Europa (Martin Kihoulou), and laboratory studies of ice rheology relevant to icy moons (Christophe Sotin). These presentations demonstrated the rapid expansion of geodynamical modelling toward planetary applications.

Poster presentations formed a central component of the meeting. Three poster sessions, combined with short oral introductions by presenters, generated extensive discussion and facilitated interactions between established and early-career scientists. Three outstanding ECS poster presentations were awarded: Ranpeng Li, Alan Yu and Amita Anand. As in previous workshops, plenary discussions held at the end of each day provided opportunities to identify emerging challenges, compare methodologies, and discuss future directions for the field.

Wednesday was devoted to practical activities and networking. Participants could choose among a geological field excursion led by Pavlína Hasalová, Petra Maierová and Luc de Hoÿm de Marien, a visit to the Bomma glassworks in Světlá nad Sázavou led by Lucie Tajčmanová, or various recreational activities around Lake Seč. The day also featured hands-on training sessions dedicated to MAGEMin (led by Boris Kaus) and the Geodynamic World Builder (led by Menno Fraters, Michael Pons, and Daniel Douglas). These workshops introduced participants to modern community tools that facilitate thermodynamic modelling and the construction of realistic geodynamic model setups.

Budget

We had 134 participants attending in person, of which 88 registered as ECS (65 %). Total budget of the meeting was about 1 900 000 CZK (~79 000 EUR). We obtained financial support 8 000 EUR from EGU (used to lower the registration fee for ECS participants), 50 000 CZK (~2 000 EUR) from Charles University (covering the cost of renting the conference facilities) and 30 000 CZK (~1 200 EUR) from Czech Geological Surwey (covering the costs associated with the preparation and printing of conference materials). Five nights of full board in a shared room plus conference registration costed only 10540 CZK/person for ECS (~435 EUR). The support from EGU contributed to achieve these low registration rates.

Summary and future plans

The 2026 Ada Lovelace Workshop is widely regarded as a highly successful event. The venue provided an excellent environment for both scientific exchange and community interaction, while the programme featured cutting-edge research spanning Earth and planetary geodynamics. Poster sessions, student–speaker meetings, workshops, excursions, and social activities all contributed to the workshop's collaborative and welcoming atmosphere.

The Ada Lovelace conference series has played a central role in bringing together the international geodynamics modelling community for nearly four decades. Over this period, the meetings have witnessed and supported remarkable developments, from the emergence of three-dimensional mantle convection models to modern multiphysics simulations, machine-learning-assisted approaches, and planetary applications.

The tradition of dedicated geodynamics modelling meetings will continue, with the next Ada Lovelace workshop planned for 2028 in the Netherlands.

Reported by Hana Čížková, Petra Maierová, Vojtěch Patočka and Ladislav Hanyk, July 2026.