PEEX Research Collaboration Online Meeting/Seminar

University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR)
& Moscow Institute of Physics and Technology, R&D Center for Environmental Monitoring (MIPT-CEM)

10 November 2021, Wednesday, 13-17+ pm of Helsinki time (14-18+ pm Moscow time)

The PEEX research collaboration – University of Helsinki (UHEL), Institute for Atmospheric and Earth System Research (INAR) and the Moscow Institute of Physics and Technology (MIPT), Center for Environmental Monitoring (CEM) – online meeting/ seminar took place on 10 November 2021. The researchers (16) attended the meeting and delivered a series of presentations about INAR & GlobalSMEAR Initiative; research activities in the area of sustainable development at MIPT; PEEX programme science plan and research collaboration; ACTRIS & eLTER & SMEAR activities; high resolution laser heterodyne spectrometer for greenhouse gas monitoring network; INAR multi-scales and -processes modelling approaches; atmospheric sounding onboard UVA and microsatellites: implications to large-scale monitoring networks; ICOS Finland; science-oriented university education at MIPT and INAR.

Both the MIPT & UHEL colleagues learned about ongoing research carried out in the Universities. Discussions started around the GlobalSMEAR Initiative and the SMEAR concept, and in particular, to start practical cross-calibration of MIPT equipment/instruments at SMEAR-II station (https://www2.helsinki.fi/en/research-stations/hyytiala-forestry-field-station; Hyytiälä, Finland) and to make joint experiments at Hyytiälä. It is a good approach for common technological development with support of each other including joint observations in Russia and Finland and their intercomparison. It will also create an additional opportunity for visiting SMEAR-II (through ACTRIS Calls) with joint writing research plans with science focus and expected outcomes. All these will lead to joint publications in peer-reviewed journals. Moreover, it has been decided to initiate collaboration within frameworks of the Snowflake Arctic station (https://arctic-mipt.com/en; located in the Polar Ural region, Yamalo-Nenets Autonomous Okrug, Russia;important geographical area for long-term monitoring/ measurements in the Arctic), where the SMEAR station type approach/ measurements can be established as well as visits of Finnish researchers. Currently, the Snowflake project work is in development and a full operational capacity is expected in 2 years. Concerning modelling activities, MIPT is interested, first of all, in a local scale as well as collaborates with the Institute Numerical Mathematics, Russian Academy of Sciences on global climate modelling. The UHEL-INAR has multi-scales and -processes modelling capabilities (https://www2.helsinki.fi/en/researchgroups/multi-scale-modelling/research-and-models) and these modelling tools are integral part of the PEEX-Modelling-Platform (https://www.atm.helsinki.fi/peex/index.php/portfolio-items/modelling-platform).

Joint research activities and proposals/ projects are also beneficial, and these can include (to be continuously monitored) suitable Calls: ACTRIS for visiting and researching at the SMEAR-II station; NordForsk; Academy of Finland & Russian Science Foundation, when Calls on collaboration with Russia & Finland; joint Russian-Finnish Megagrants; Horizon-Europe Calls – involvement of MIPT as the PEEX Russian partner in the consortium with application for national funding from the Ministry of Science and Higher Education of Russia; Finland-Russia Cross-Border-Collaboration programmes; and other opportunities.

For PEEX as well as for the Universities, the science education is important, and similarly, **joint educational activities and proposals/ projects** are important aspect of mutual collaboration, and these include: students'/ teachers'/ researchers' exchanges and academic mobility; joint co-supervision of students; bi-lateral Finland-Russia Calls from the Finnish Ministry of Education and Culture (TFK programme); Erasmus+ Calls – with educational focus, mobilities for individuals, etc.; Marie Skłodowska-Curie Actions – with creating network of Doctoral Training Centres (under PEEX umbrella); Erasmus+ strategic / cooperation partnerships Calls for actions called "Forward-looking projects" – with answering central challenges in education and training for climate change sciences; Erasmus Mundus Joint Masters – with developing high level integrated MSc programmes in physical, atmospheric, other sciences; Russian Science Foundation suitable Calls – for University education, young scientist schools, etc.

The **nearest join plans** are: signing the PEEX MoU; continuously monitoring suitable research and educational Calls and jointly applying; discussing/signing agreement on students/teachers mobilities/exchanges; arranging visits between MIPT and UHEL. The MIPT plans to prepare/ design a roadmap (research and education) for the nearest and long-term collaboration with PEEX; and to initiate discussions and arrangements on putting instruments for measurements at SMEAR-II station. The UHEL plans to arrange MIPT visit to the SMEAR-II station and start (Jan 2022) to involve MIPT into the TFK PEEX-FRESReN project activities on science education.

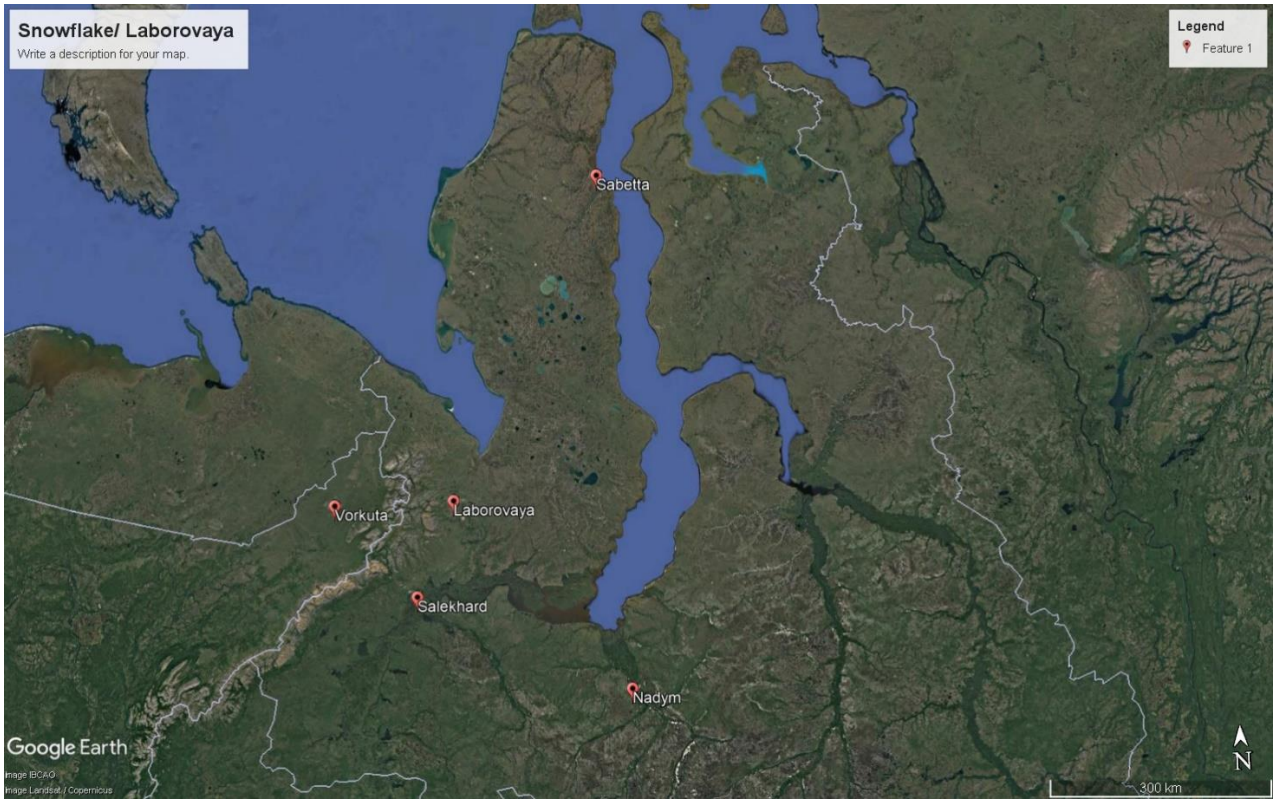
Text by Irina Obukhova, Alexander Rodin (MIPT) & Hanna K. Lappalainen, Alexander Mahura (UHEL-INAR)

SUMMARY OF INAR-MIPT DISCUSSIONS:

Both MIPT & UHEL – learned about research carried out in the Universities & impressed (based on presentations) with comprehensive and multidisciplinary approaches taken

(1) **SMEAR** - Let's start with practical cross-calibration of MIPT equipment/instruments at SMEAR-II station (https://www2.helsinki.fi/en/research-stations/hyytiala-forestry-field-station; Hyytiälä, Finland); joint experiments at Hyytiälä (UHEL - host), good approach for common technological development of UHEL & MIPT with support each other; joint observations in Russia and Finland, intercomparison; additional opportunity for visiting SMEAR-II (through ACTRIS Calls; https://www2.helsinki.fi/en/inar-institute-for-atmospheric-and-earth-system-research/infrastructure/transnational-access) - jointly write/make research plans with science focus & expected outcomes; joint publications in peer-reviewed journals;

(2) **SNOWFLAKE** - Initiate collaboration within frameworks of the Snowflake (Snezhinka) Arctic station (https://arctic-mipt.com/en; *location - Polar Ural region, Yamalo-Nenets Autonomous Okrug; distances: Salekhard – 120 km, Vorkuta – 150 km, Nadym – 310 km, Sabbetta – 430 km*) where SMEAR station type approach/ measurements can be established (& Finnish researchers' visits); looking for resources to establish SMEAR station at the Snowflake location;
Current situation at SnowFlake: project work development, geodesic measurements, decision made and main buildings to be constructed – to be ready and equipment running in 2 years, fully operational, electricity (hydrogen, own development), access - all year around; summer 2022 – start expeditions in the area; important geographical area for long-term monitoring/ measurements in the Arctic; mobile version of equipment (development) to cover more larger area of measurements;



(3) **MODELLING** – MIPT is interested in local scale & also now collaborates with INM RAS (Institute Numerical Mathematics, Russian Academy of Sciences) on global climate modelling; UHEL-INAR has multi-scales and -processes modelling capabilities (https://www2.helsinki.fi/en/researchgroups/multi-scale-modelling/research-and-models & recent YSSschool https://megapolis2021.ru & PEEX-Modelling-Platform - https://www.atm.helsinki.fi/peex/index.php/portfolio-items/modelling-platform)

(4) **RESEARCH CALLS / JOINT PROPOSALS/ ACTIVITIES**

- ACTRIS Calls (https://www.actris.eu/index.php/open-calls) for visits to SMEAR-II
- NordForsk Calls (https://www.nordforsk.org/en/funding)
- Academy of Finland, AoF (http://www.aka.fi/en/funding), when Call on collaboration with Russia
- Russian Science Foundation, RSF (https://rscf.ru/en), when Calls on collaboration with Finland
- Joint Russian-Finnish Megagrants, funded by the Russian Government (*recent successful example; "Megapolis - heat and pollution island: interdisciplinary hydroclimatic, geochemical and ecological analysis"; 2021-2025;* https://peexhq.home.blog/2021/06/28/updates-on-the-megagrant-project)
- Horizon-Europe Calls - involvement of MIPT as the PEEX RU Partner in the Consortium & then, application for national funding from the Ministry of Science and Higher Education of Russia (*recent successful examples - 3 Russian Sister Projects to the European projects: H2020 RI-URBANS, 2021-2025 (https://peexhq.home.blog/2021/09/29/h2020-ri-urbans) & H2020 CRiceS, 2021-2025 (https://peexhq.home.blog/2021/10/22/russian-sister-project-to-the-horizon-2020-crices*)
- Finland-Russia Cross-Border-Collaboration (CBC) programmes Calls (https://peexhq.home.blog/2021/04/07/kolarctic-karelia-south-east-finland-russia-programmes-2021-2027-peex-russia-cross-border-collaboration-opportunities)

(5) **EDUCATION CALLS/ JOINT PROPOSALS/ ACTIVITIES**

- MIPT is interested in Universities' student exchanges, academic mobility & has internal funds for inviting researchers to laboratories of MIPT; UHEL/ INAR/ PEEX educational courses/ trainings/ schools/ activities - https://www.atm.helsinki.fi/peex/index.php/portfolio-items/peex-benchmarked-courses; considering possibilities of joint co-supervision of students;
- Bi-lateral FI+RU Calls from the Finnish Ministry of Education and Culture (after the FISRT+, the new TFK Calls will annually open – let's look for suitable Call, to be open in spring 2022 (*recent successful example – 3 Russian PEEX collaborating partners: TFK PEEX-FRESReN (https://peexhq.home.blog/2021/09/22/peex-fresren); UHEL will invite MIPT to join selected activities*);
- Erasmus+ Calls (nearest to be open - end Nov 2021 & dl – Feb-Mar 2022 + new ones are expected in 2022) – educational focus, mobilities for individuals (this year open for mobilities from FI to RU, but not from RU to FI), mobilities of UHEL/MIPT MSc/PhD students to MIPT/UHEL (agreement needs to be signed between MIPT & UHEL/Faculty of Science) (*successful example: Erasmus+ MODEST project; 2018-2022; https://www.emodest.eu; MIPT & UHEL are involved*);
- Marie Skłodowska-Curie Actions (MSCA) Calls - Creating Network of Doctoral Training Centres, DTCs (under PEEX umbrella) (*example of Aalto Univ established DTC*);
- Erasmus+ strategic / cooperation partnerships (supports partnerships between higher education institutions) Call in 2022 – for action called "Forward-looking projects" (funding projects answering central challenges in education and training) & climate change might be a theme of interest;
- Erasmus Mundus Joint Masters - high-level integrated study programmes at master level (development of MSc programme in physical, atmospheric sciences; at least, 3 from EU + 3 from non-EU partners);
- Russian Science Foundation, RSF (https://rscf.ru/en) suitable Calls for the University education, young scientist schools, etc.

NEAREST JOIN PLANS:

BOTH MIPT & UHEL: (i) signing the PEEX MoU; (ii) continuously monitoring suitable research and educational Calls and jointly applying; (iii) discussing/signing agreement between MIPT and UHEL/Faculty of Science on students/teachers mobilities/exchanges; (iv) continue discussions during the ACCC Impact Week 7-10 Dec 2021 (Finland)

MIPT: (i) prepare/design roadmap (research and education) for the nearest and long-term collaboration with PEEX; (ii) initiate discussions and arrangements on putting instruments for measurements at SMEAR-II station; (iii) arrange UHEL visit to MIPT

UHEL: (i) arrange MIPT visit (in 2022; waiting for covid19 situation improvements) to UHEL-INAR and SMEAR-II station; (ii) involve MIPT into FI-RU TFK PEEX-FRESReN project activities (starting Jan 2022)

PEEX Science Plan in English: https://www.atm.helsinki.fi/peex/images/PEEX_Science_Plan.pdf
in Russian: https://www.atm.helsinki.fi/peex/images/PEEX_Science_Plan_rus.pdf
PEEX Special Issue, Vol II: https://acp.copernicus.org/articles/special_issue1103.html (manuscripts are welcome)
PEEX Session at EGU-2022: https://peexhq.home.blog/2021/10/15/egu-2022-peex-special-session (abstracts are welcome)
GlobalSMEAR Initiative: https://www.atm.helsinki.fi/globalsmear
SMEAR Stations: https://www.atm.helsinki.fi/SMEAR