



## PROGRAM

### Partner Conference

Cryosphere- Carbon-Climate Interactions in the Siberian Arctic Ocean:  
Current State and Future Directions  
**Tomsk Polytechnic University (TPU) Siberia**  
**Mon –Thurs 21-24 November**

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The intent of the proposed program structure is to both provide a robust orientation of developments and plans in the different research tracks and partner groups, give ample time for interactions on specific ongoing collaborative work and provide a platform for us to jointly develop plans for the future.

## Monday 21 Nov

**07:00-12:00** Arrival of participants via Moscow to Tomsk. Airport transfer to Hotel Toyan check-in, breakfast and some recovery after night flight.

**13:30-14:00** Transport to TPU Main Building

**14:00-15:00** Registration, light lunch buffet and social icebreaker (TPU Museum)

**15:00-15:50** Welcome and orientation session (TPU Museum)

- Welcoming and introduction of all research groups and participants
- Overview of the Partner Research Conference 2016 – discussion of the program
- Practical information

**15:50-16:00** Group photo by megapainting of TPU:s Mendeleev (Museum)

**16:00-17:30** Bus Tour of Tomsk City Center

**17:30/18:00** Dinner at International Cultural Center of TPU



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## Tuesday 22 Nov

### AM at Main Building of TPU

**08:30-09:00** Transport to Main Building of TPU

**9:00-10:30 Opening Session** (The Assembly Hall, Main Building of TPU)

- Welcoming words by TPU Rector *Petr Chubik* and Vice Rector *Alexey Mazurov*
- Welcoming words by academician *Valentin Sergienko*, Vice-President of the Russian Academy of Sciences
- Brief overview of the setting - the ESAS system characteristics. Presentation of major Russian-funded programs by *Igor Semiletov*
- Brief overview of key carbon-climate-cryosphere compartments and processes. Presentation of major programs such as the KAW funded ISSS-08 and SWERUS-C3, and the ERC-AdG CC-TOP by *Örjan Gustafsson*

**10:30 Coffee Break**

**11:00-12:30 Session on Cryosphere-Carbon System** (The Assembly Hall , Main Building of TPU)

*Igor Semiletov for Natalia Shakhova: "Methane release from ESAS: brief overview 2003-2016"*

*Leopold Lobkovsky: "Natural conditions and mechanic of gas movement in sediment rocks of Arctic shelf"*

*Örjan Gustafsson: "On inverse approaches to fingerprint and study coastal PF (ICD) fluxes and possibly a preview on methane from slope hydrates"*

*Irina Repina et al: "Air-river interaction during transsiberian experiment on Ob river"*

*Andrey Skorokhod et al: "TROICA experiments (1995-2010): main results of multi-annual atmospheric observations over the Northern Eurasia from train-based mobile laboratory"*

*Vasiliy Kustov: "Bolshevik island observatory "Ice camp "Cape Baranova"*

**12:30-13:00** Transport to International Cultural Center of TPU

**13:00-14:00 Lunch** at International Cultural Center of TPU



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**14:00-14:30** Transport to Building #1 of TPU

**PM at TPU Institute of Natural Resources**

**14:30-16:00** Session on Contemporary Carbon Geochemistry (Building # 1 of TPU)

*Leif Anderson:* "What can chemical signatures tell us about the interaction between the East Siberian Seas and deep Arctic Ocean?"

*Irina Pipko:* "Air-sea carbon dioxide fluxes in the Eurasian Arctic seas"

*Bart van Dongen:* "Fate of microbial and macro molecular Terrestrial Organic Matter on the East Siberian Arctic Shelf"

*Lisa Bröder:* "Cross-shelf transport of terrigenous organic carbon: duration, burial and degradation"

*Lisa Bröder for Jorien Vonk:* Perspectives for ERC-StG THAWSOME at VU University Amsterdam

**16:00-16:30** Coffee Break

**16:30-17:30** General Poster Session #1 (Building # 1 of TPU) (see poster list below)

**17:30-18:00** Transport to Hotel Toyan

**18:00 - Dinner** individual or in groups, at Hotel Toyan or out on Tomsk town



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**Wednesday 23 Nov**

**At TPU Institute of Natural Resources**

**08:30-09:00** Transport to Building #1 of TPU

**9:00-10:30 Session on Permafrost-carbon remobilization in earlier warming periods**

*Tommaso Tesi: "Insights into permafrost thermal destabilization during last deglaciation: current knowledge and future directions"*

*Igor Semiletov: "Selected results of the drillcore campaign (2011-2015)"*

**10:30-11:00 Coffee Break**

**11:00-12:30 General poster session #2** (see poster list below)

**12:30-13:00** Transport to International Cultural Center of TPU

**13:00-14:00 Lunch** at International Cultural Center of TPU

**14:00-15:00** Presentation and tour of Inst of Natural Resources, incl the new "International Laboratory for Carbon Studies in the Arctic Seas" (Andrey Grinko and Prof Goncharov)

**15:00-15:30 Discuss and decide on small-group breakout topics.**

These can be to talk through specific science issues, outline/work on current ongoing papers, envision the next-step in the collaborative research, define needs for exchange of samples, analyses, personnel/visits. It may be useful to focus these around topics such as:

- Subsea permafrost studies, incl drill core and seismo-tectonic investigations
- Methane studies
- System studies of contemporary carbon cycling
- System studies of historical carbon cycling
- Establishment of atmospheric program on Bolshevik Island )
- 2016 Ob and Lavrentiev expeditions/samples/studies/exchanges
- Interactions with statistical modeling, permafrost modeling, ESM/climate modeling

**15:30-16:00 Coffee break**

**16:00-17:30 Breakout session #1** (Building # 1 of TPU)

**17:30-18:00 Transport to Hotel Toyan**

**18:00-19:00 - Dinner** individual or in groups, at Hotel Toyan or out on Tomsk town



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## Thursday 24 Nov

### AM at TPU Institute of Natural Resources

**08:30-09:00** Transport to Building #1 of TPU

**09:00-10:30 Breakout session #2**

**10:30-11:00 Coffee Break**

**11:00-12:30 Breakout session #2:** continued small-group work

**12:30-13:00** Transport to International Cultural Center of TPU

**13:00-14:00 Lunch** at International Cultural Center of TPU

### PM at International Cultural Center of TPU

**14:00-15:30** Press conference and interviews (possibly brief public lecture) (International Cultural Center of TPU - Auditorium)

**15:30-17:00 Final Plenary session** (International Cultural Center of TPU - Auditorium)

- Brief reports and all-hands discussions on breakout sessions
- The future developments of our collaborative efforts: where do each/we want to take the research next? (short talks welcomed!)

**17:00 Transport** to hotel and/or restaurant

**17:30/18:00 Evening reception and conference dinner**

## Friday 25 Nov

**Early morning – transport to Tomsk airport.**

**Travel day**



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## Posters

1. *Artamonov A.Yu., Repina I.A.*: “Devices and methods for methane fluxes measurement”
2. *Charkin A. et al.*: “Tracing and characterization of submarine wintertime groundwater discharge in the Siberian Arctic seas: case study in Buor-Khaya Gulf, Laptev Sea”
3. *Chernykh D. et al.*: “Acoustic estimation methane flux from the Laptev Sea seeps”
4. *Chuvilin E., Bukhanov B., Grebenkin S., Tumskoy V., Shahova N., Dudarev O., Semiletov I.*: “Thermal conductivity of bottom sediments in the Buor-Khaya Bay (Laptev Sea shelf)”
5. *Dudarev O. et al.*: “East Siberian Sea: suspended particulate matter composition, spatial and temporal variability”
6. *Grinko A. et al.*: “Investigation of molecular composition of the organic matter of the Laptev sea surface sediments”
7. *Gustafsson Ö. et many.*: “The Cryosphere-Carbon on Top of the Earth (CC-Top): Inviting discussion on future directions of C-C-C research in the Arctic”
8. *Ignatova A. and Eglinton T. (ETH)*: “MOSAIC: Modern Ocean Sediment Archive and Inventory of Carbon with emphasis on the Arctic Ocean Shelf Seas”
9. *A.V. Koshurnikov et al.*: “Results of electromagnetic sounding application for submarine permafrost table mapping on the Laptev Sea shelf”
10. *Kosmach D. et al.*: “Surface Methane concentration in the Seas surrounded the Northern Eurasia”
11. *Pankratova N., Skorokhod A., Belikov I., Novigatsky A., Thompson R.*: “Observations of atmospheric methane and its stable isotope ratio ( $\delta^{13}C$ ) over the Arctic seas from ship cruises in the summer and autumn of 2015”
12. *Panova E. et al.*: “Influence of mineralogical surface sediment properties on TerrC distribution across the East-Siberian Arctic Shelf”
13. *Pipko I. et al.*: “CO<sub>2</sub> - system dynamics in the changing Arctic: The Eurasian Arctic seas”
14. *Pipko I. et al.*: “Multi-year study of carbonate system in the Chukchi Sea with emphasis on its western part”
15. *Pugach S. et al.*: “DOM and its optical characteristics in the Laptev and East Siberian seas: the spatial distribution and its inter-annual variability (2003-2011)”
16. *Repina I., Artamonov A.Yu., Stepanenko V.M.*: “Air-water gas exchange measured at low and moderate wind speed over lakes and sea”



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17. *Ruban A. et al*: "Lithological and biogeochemical features of Buor-Khaya Gulf bottom sediments"
18. *Salvado J.A., Tesi T., Karlsson E., Kruså M., Sundbom M., Panova E., Semiletov I., Gustafsson Ö.*: "Contrasting composition of terrigenous organic matter in the DOC, POC and SOC pools on the outer East Siberian Arctic Shelf (ESAS)"
19. *Salyuk A. et al*: "An application of the noble gases mass-spectrometry for the bottom-water-air methane release study in the East Siberian Arctic seas"
20. *Salyuk A. et al*: "Observational evidence of massive methane release in the seepage areas in the Laptev and East Siberian seas: initial results of the 78th cruise onboard RV "Academician M.A. Lavrentiev" (24 September-2 November 2016)"
21. *Shcherbakova K. et al*: "On methane isotopic composition in the East Siberian Seas and Ob River: initial results and new sampling"
22. *Sparrow and Kessler*: "Limited contribution of ancient carbon-sourced methane to the modern atmosphere from the Alaskan Arctic Ocean"
23. *Spivak E. et al*: "On hydrological Regime in the Laptev Sea in fall 2016: initial results"
24. *Steinbach J., Holmstrand H., Shakhova N., Semiletov I., Shcherbakova K., Kosmach D., Sapart C., Gustafsson Ö.*: "Source apportionment of methane using a triple isotope approach: Method development and application in the Baltic Sea & Arctic Ocean"
25. *Tumskoy V., Dudarev O., Semiletov I.*: "The temperature field in the sediments on the Laptev sea shelf"
26. *Vonk J., Tesi T., Bröder L., Hugelius G., Kuhry P., Gustafsson Ö.*: "Distinguishing between old and modern permafrost sources with compound-specific  $\delta^2\text{H}$  analysis"



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## **Participants**

**TPU** megagrant group, organic geochemistry and geology: Semiletov, Mazurov, Dudarev, Goncharov, Charkin, Panova, Grinko, Ruban, Savichev, Perevertaylo, Moiseeva, Yurina, Yazikov, Shvartsev, Rikhvanov, Serebrennikova, Baranovskaya, Guseva, Kopylova, other TPU partners

**FEBRAS-POI:** Chernykh, Kosmach, Salyuk, Pipko, Pugach, Scherbakova, Spivak

**RAS - Shirshov Inst Oceanol. and MSU:** Lobkovsky, Tumskoy, Koshurnikov, Chuvilin

**RAS – Inst of Atmos Physics (Moscow):** Repina, Pankratova, Artamonov, Skorokhod

**RAS – Inst of Cryst (Moscow):** Yusupov

**AARI (Hydromet):** Sokolov

**Stockholm University (Dept of Env Sci and Analytical Chem; and Bolin Centre for Climate Research):** Örjan Gustafsson, Henry Holmstrand, Lisa Bröder, Cecilia Bandh, new post-doc Birgit Wild, new post-doc Katy Sparrow

**Univ of Gothenburg (Dept Marine Sciences):** Leif Anderson

**ETH-Zürich:** Anastasiia Ignatova (Eglinton group)

**Univ Manchester:** Bart van Dongen

**Free Univ of Amsterdam:** Vonk – possibly by videolink, new post-doc Lisa Bröder

**Italian Marine Science Institute Bologna:** Tommaso Tesi



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Knut och Alice  
Wallenbergs  
Stiftelse



**Partner Conference Context and Rationale:** The research program initiated by Russian-Swedish collaborators to investigate the interactions between the Cryosphere (e.g., land and subsea permafrost, hydrates and sea ice), the large-scale Carbon cycle processes, under Climate changes (i.e., C3), in the Siberian Arctic Ocean margin, has grown to a sizeable international collaboration. The efforts have been structured into programs such as the International Siberian Shelf Study (ISSS) and the Swedish-Russian-US Investigation of Cryosphere- Carbon-Climate Interactions in the East Siberian Arctic Ocean (SWERUS-C3; participants from 14 countries). The research into the C3 processes in the Siberian Arctic system associated with thawing permafrost and collapsing methane hydrates have grown into one of the grand challenges in climate and geosciences. The collaborative program has received funding to partner PIs in many countries over the years. The program is now in a highly productive phase w.r.t. research output, and is at the same time going through some important transitions and expansions, motivating the suggested conference. The core funding from the Swedish K+A Wallenberg Foundation for the 5-year SWERUS-C3 Program is formally coming to an end, and at the same time new funding from the Russian Government Megagrant (to Semiletov, Tomsk) the European Research Council ERC Advanced Grant (to Gustafsson, Stockholm) the Russian Scientific Foundation (to Shakhova, Tomsk), the ERC Starting Grant (to Vonk, Amsterdam) and the UK NERC (to van Dongen, Manchester) are still in early phases. The intensive international collaboration and the development of a node at Tomsk Polytechnic Univ. are supplemented by several other factors motivating a focused partner conference.

**Scope and Objectives:** The conference will serve several needed functions. First, it will facilitate planning and execution of the many collaborative co-authored research articles that are now underway, following the recent completion of major field efforts such as the i/b Oden 2014 SWERUS-C3 expedition and the 2011-2015 subsea permafrost drill-coring campaigns. Further, participants get to meet in person/small groups to work on joint subprojects/papers, including involvement and exchange with new partner groups from TPU and elsewhere. Finally, bringing the partners physically together provides an opportunity to jointly stake out directions for further breakthrough science in the coming years. The mini-conference will emphasize carbon cycling as a cross-cutting theme. We envision this partner conference to be an event recurring at a frequency of 12-24 months.



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