

Researcher profile (portfolio) form for potential research supervisors of postgraduate track participants in the Global Universities Association International Olympiad for graduate and postgraduate applicants 2023-2024.

University	National research Tomsk Polytechnic University
English language proficiency	B2.1 (Upper-Intermediate)
Applicant's postgraduate program	Earth Science. Geoecology
List of research projects of a potential research supervisor (participation/leadership)	<ul style="list-style-type: none"> • Grant of the President of the Russian Federation for Support of Young Russian Scientists "The study of anthropogenic air pollution and risk assessment for human health in urban areas of Tomsk Oblast" (2013-2014, principal leader) • Grant of BP Exploration Operating Company Limited. Topic: "Assessment of environmental risk from oil and gas companies on the dwelling items according to the study of geochemistry of dust aerosols (case study in Tomsk Oblast)" (2013-2014, principal leader) • Contract for the performance of scientific research, creation and delivery of research products «Eco-geochemical assessment area of Sorsk ore-dressing plant on the basis of snow cover and soil (Republic of Khakassia)» (2015-2017, responsible executor) • Grant of Russian Foundation for Basic Research «Air pollution and risk assessment for human health in the vicinity of power plants operating on different types of fuel to improve environmental monitoring for fuel-energy sector of Tomsk Oblast» (2016-2018, executor) • Grant of Russian Foundation for Basic Research «Creation of system of operating and processing of eco-geochemical data to increase the efficiency of its use for assessment pollution level and risk for human health in the areas under influence of coal mining» (2020-2022, executor)
List of possible research topics	<ul style="list-style-type: none"> • Eco-geochemical assessment of urban and mining areas using snow cover • Geochemistry of road (street) dust in urban areas • The impact of industries and thermal power plants on the formation of the chemical and mineral composition of particulate matter (based on the study of snow cover) • Eco-geochemistry of trace elements (mercury, arsenic, bromine, radioactive or rare earth elements) in aerosols within urban areas (based on the study of particulate phase of snow cover)
	1.6.21 Geoecology
	Supervisor's research interests (detailed description of research interests):
	<u>Geochemical environmental monitoring in urban and mining areas</u>
	Description of geochemical regularities in formation of particulate load, chemical and mineral composition of atmospheric aerosols



Research supervisor:

Anna Talovskaya,

Doctor of geological and mineralogical science (National research Tomsk Polytechnic University)

in natural and anthropogenic conditions using natural scavengers of pollutants (snow cover, road dust)

Geoindicators of atmospheric air changes under the impact of anthropogenic factors

Research highlights (if applicable):

It is used the unique equipment in the International Innovative Scientific and Educational Center "Uranium Geology" at the National Research Tomsk Polytechnic University: research nuclear reactor, scanning electron microscope, mercury analyzer, X-ray diffractometer.

It is used the modern methods to study chemical and mineral composition: instrumental neutron activation analysis, f-radiography method, atomic absorption spectrometry, atomic absorption analysis of "cold" vapor, scanning electron microscopy, X-ray diffraction analysis.

Collaboration with scientists from the Russian Academy of Sciences (RAS): Institute of Atmospheric Optics Siberian Branch (SB) RAS, Institute of Monitoring of Climatic and Ecological Systems SB RAS, Institute of Atmospheric Physics RAS, Institute of Mineralogy Ural RAS.

Supervisor's specific requirements:

- courses completed "Geoecology", "Geochemistry of the environment", "Ecology", "Chemistry and physics of the atmosphere", "Mineralogy", "Environmental monitoring"
- know methods of the environment impact assessment
- skills of writing scientific articles
- responsibility and diligence, the desire to develop and gain new knowledge

Supervisor's main publications (specify a total number of publications in journals indexed by Web of Science, Scopus, RSCI for the last 5 years, list up to 5 most significant publications with the publication details):

- **Talovskaya, A. V.** Mercury pollution in snow cover around thermal power plants in cities (Omsk, Kemerovo, Tomsk Regions, Russia) / A. V. Talovskaya, E. G. Yazikov, N. A. Osipova, E. E. Lyapina, V. V. Litay, G. Metreveli, J. Kim // *Geography, Environment, Sustainability*. – 2019. – V. 12. – № 4. – P. 132–147.
- **Talovskaya, A. V.** Macroelement and mineral-phase composition of particulate matter in the impacted area of cement production plant based on snow cover study (Kemerovo Region) / A. V. Talovskaya, D. A. Volodina, E. G. Yazikov // *Chemistry for sustainable development*. – 2019. – V. 27. – № 2. – P. 180–189.
- Buchelnikov, V. S. Analysis of the content of chemical elements in aerosols using data from Passive Sampling at Fonovaya Observatory / V. S. Buchelnikov, A. V. Talovskaya, E. G. Yazikov, D. V. Simonenkov, M. P. Tentyukov, B. D. Belan // *Atmospheric and Oceanic Optics*. – 2020. – V. 33. – № 5. – P. 490–495.

	<ul style="list-style-type: none"> • Talovskaya A.V. Chemical composition of atmospheric particulate matter in the winter season as indicator of environment quality within urban areas / A.V. Talovskaya, V.D. Kirina, V.V. Litay, T.S. Shakhova, D.A. Volodina, E.G. Yazikov // Pure and Applied Chemistry. – 2022. –V. 94 (3). – № 8 – 249–256. • Osipova N. A. Content of toxic elements in street dust and risk assessment for human health (Mezhdurechensk, Southern Kuzbass) / N. A. Osipova, K. Yu. Osipov, A. V. Talovskaya, E. G. Yazikov, E. A. Filimonenko, S. A. Novikov // Bulletin of the Tomsk Polytechnic University. Geo Assets Engineering. – 2023. – Vol. 334. – № 3. – P. 229–244.
	<p>Intellectual property rights (if applicable)</p> <ul style="list-style-type: none"> • Method for determining the snow cover pollution of anthropogenic components: Patent No. 2229737 Russia, IPK7 G from 01 To 9/00 / E. G. Yazikov, A. Yu. Shatilov, A.V. Talovskaya; applicant and patent holder Tomsk polit. un-T. – No. 2002127851; application 17.10.2002; publ. 27.05.2004. • Method for determining the c of snow cover pollution of radioactive components: Patent No. 2453869 Russia, IPC g 01 91/169 t / E. G. Yazikov, A.V. Talovskaya, A. F. Sudyko, E. A. Filimonenko; applicant and patent holder Tomsk polit. un-T. – No.2011100193/28; application 11.01.2011; publ. 20.06.2012. • Database of Dust Load and Element Composition of Snow Insoluble Phase: Certificate of state registration of the database No. 2016620754 / applicant and patent holder Tomsk polit. un-t. application / E. G. Yazikov, A.V. Talovskaya, E. A. Filimonenko, V. V. Zhukov – No.2016620468; 04/18/2016; register. 07.06.2016. • Database of chemical element contents in street dust within the city of Mezhdurechensk / Certificate of state registration of the database 2021623276, 12/28/2021. Application No. 2021623234 dated 20.12.2021 / N. A. Osipova, K. Yu. Osipov, A. V. Talovskaya, E. G. Yazikov