

University	Peter the Great St.Petersburg Polytechnic University
Level of English proficiency	Proficient (C2)
Educational program and field of the educational program for which the applicant will be accepted	BIOLOGY & BIOTECHNOLOGY 1.6.21. Geoecology 1.5.6. Biotechnology
List of research projects of the potential supervisor (participation/leadership)	<ol style="list-style-type: none"> 1. From 2017 -2020, head of the grant under the federal target program "Research and development in priority areas of development of the scientific and technological complex of Russia for 2014 - 2020", on the topic: "Development and implementation of innovative biotechnologies for the processing of microalgae <i>Chlorella sorokiniana</i> and duckweed <i>Lemna minor</i>" AGREEMENT No. 14.587.21.0038. Project unique ID RFMEFI58717X0038. 2. In 2018, she completed an internship with the support of the DAAD Foundation at the Hamburg University of Technology. Personal code: 91695876. 3. In 2020, a participant (as a lecturer) in the implementation of the Russian-German project GIZ (German Society for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ])) "Climate-neutral waste management in the Russian Federation" (agreement No. 15-20, dated 11/23/2020). 4. In 2020, the winner and participant of the competition held in the Republic of Korea, "Global Program for the Commercialization of Source Technologies 2020" of the Technological and Information Development Agency for Small and Medium Enterprises of the Republic of Korea (TIPA). 5. In 2021, she was invited as a scientific expert from Russia by DAIN NATURAL CO., LTD. (Republic of Korea), supported by TIPA. Project topic: "Obtaining valuable components from microalgae" (contract No. 2020-KL-10 dated May 5, 2021) 6. Leader of the topic "Use of biomass to produce hydrogen and reduce the carbon footprint" in the project "New solutions in energy and resource saving", implemented under the project "Priority 2030" (Agreement 075-15-2021-1333 of 30.09.2021). 7. Head of household Agreement No. ITS 3-22-1sp dated January 15, 2022 with LUKOIL-Engineering Skills and Competences. Topic: "Growing of biomaterials (algae) in an environment enriched with CO2".
List of the topics offered for the prospective scientific research	<ol style="list-style-type: none"> 1-Recycling of waste into consumer goods 2- Obtaining sorption materials for water treatment 3- Obtaining a bioplastic 4- Conducting monitoring studies of microplastics 5- Biological treatment of water systems 6-Reducing the carbon footprint of biomass 7- Phytoremediation technologies for water treatment.
	1.05. Earth and related environmental sciences
	Supervisor's research interests Description of scientific interests Solving environmental problems. Wastewater treatment with sorption materials,



Research supervisor:

Natalia Politaeva

Doctor of technical sciences
(03.02.08-ecology),

Professor

biosorbents (microalgae, higher aquatic plants), air purification from CO₂. Recycling, obtaining valuable components from waste.

Research highlights

During their studies, graduate students will study in detail:

1. Innovative methods of purification of water, air, soil.
 2. Modern technical means and methods of environmental monitoring of environmental quality.
 3. Waste management to clean up the technological circular economy.
 4. The main sources of soils, rocks and groundwater, exceptions and dangers of natural and man-made processes.
 5. Characterization, assessment of the state and management of natural and man-made landscapes.
 6. Development of scientific bases for the natural use and protection of water, air, land resources of the Earth, rehabilitation and reclamation of disturbed lands, resource conservation and disposal of production and consumption waste, their use as a result of construction, economic activity and operation of housing and communal services.
 7. Geoecological substantiation of the safety of shelter, storage and disposal of pollution, emissions and other wastes, including building structures and materials contaminated with radiation or chemical contamination.
 8. Theory, methods, technologies and tools for the assessment of the state, protection, restoration and management of natural and man-made causes, including agricultural landscapes, based on the implementation of construction, economic activity and housing and communal services.
- construction, housing and communal services, nature management and environmental protection.

Supervisor's specific requirements:

Potential graduate students must have knowledge in the field of ecology, chemistry, biology, engineering sciences. Must be purposeful, responsible and love working in the laboratory.

Supervisor's main publications

80

1. Patent 2714815 RF, IPC B01J 20/30 (2006.01) B01J 20/24 (2006.01) Biogas production method / Politaeva N.A., Smyatskaya Yu.A., Atamanyuk I.; applicant and patent holder Federal State Autonomous Educational Institution of Higher Education "Peter the Great St. Petersburg Polytechnic University" (FGAOU VO "SPbPU"), RU - No. 2019124500; dec. 08/01/2019; publ. 02/19/2020.
2. PAT. 2708860 RF IPC B01J 20/30 (2008.01) B01J 20/24 (2008.01) Method for obtaining sorption materials / Politaeva N.A., Smyatskaya Yu.A., Dolbnya I.V.: applicant, patent holder Federal State Autonomous Educational Institution of Higher Education "St. Petersburg Polytechnic University of Peter the Great" (FGAOU VO "SPbPU"), RU - No. 2019117868, application. 06/07/2019, publ. 12/11/2019.
3. Pat. No. 2537004 Russian Federation, IPC C 02 F 1/28, B 01 J 20/24, B 01 J 20/08. Sorbent for wastewater treatment from heavy

	<p>metal ions / Sobgaida N.A., Ulyanova V.V., Olshanskaya L.N., Makarova Yu.A.; applicant and patent holder Federal State Budgetary Educational Institution of Higher Professional Education "Saratov State Technical University named after Yu.A. Gagarin". - No. 2013133591/05, application 07/18/2013; publ. December 27, 2014, Bull. № 36 // www1.fips.ru</p> <p>4. Pat. No. 139205 Russian Federation, IPC B 01 J 20/00, B 01 J 20/30. Installation for obtaining a sorbent for water treatment / Sobgaida N.A., Ulyanova V.V., Chirkova V.S.; applicant and patent holder Sobgaida Natalya Anatolyevna. - No. 2013153866/05, Appl. 04.12.2013; publ. 10.04.2014, Bull. № 10 // www1.fips.ru</p> <p>5. Pat. No. 2694969 Russian Federation, IPC C08B 37/06 Method for obtaining pectin substances from duckweed Lemna minor / Politaeva N.A., Smyatskaya Yu.A., Oparina A.M.; applicant and patent holder Federal State Autonomous Educational Institution of Higher Education "Peter the Great St. Petersburg Polytechnic University" (FGAOU VO "SPbPU"). - No. 2018142405, Appl. 12/01/2018; publ. 07/18/2019, Bull. № 20 // www1.fips.ru</p> <p>6. Pat. No. 2694405 Russian Federation, IPC C12N 1/12, C12P 1/00, C12R 1/89 Method for extracting lipids from microalgae Chlorella sorokiniana / Politaeva N.A., Smyatskaya Yu.A., Trukhina E.V.; applicant and patent holder Federal State Autonomous Educational Institution of Higher Education.</p>
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