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	Tomsk Polytechnic University
Level of English proficiency	A2
Educational program and field of	2.6.12 - Chemical technology of fuels and high-energy
the educational program for	substances
which the applicant will be	
accepted	
List of research projects of the	Grants
potential supervisor	1. Grant of the President of the Russian Federation 2022-
(participation/leadership)	2023 "Improving the efficiency of catalytic processing of
	gasoline fractions into high-octane components of
	gasoline with improved environmental characteristics"
	(Role - leader).
	2. RPF Grant 2019-2022. Fundamental mathematical models
	of the processes of processing petroleum raw materials
	into high–octane gasoline and diesel fuel – The 2019
	Contest "Conducting research by scientific groups under
	the leadership of young scientists" of the Presidential
	Program of research projects implemented by leading
	scientists, including young scientists (The role is the main
	performer).
	3. RFBR Grant 2020-2022. Mathematical modeling of
	catalytic cracking, taking into account coke deposition on
	the catalyst grain, is a competition for the best projects of
	fundamental scientific research conducted jointly by the
	Russian Foundation for Basic Research and the Royal
	Society of London (the role is the main performer).
	4. Grant of the President of the Russian Federation for state
	support of young Russian scientists 2018-2019 MD -
	4620.2018.8 "Improving the energy efficiency of deep
	processing of vacuum distillates and creating scientific
	and technical foundations for building predictive models
	of the catalytic cracking process" (executive role).
	5. RFBR Grant 2018-2019 Investigation of the influence of
	the composition and structure of asphaltenes of oil
	dispersion systems on the thermal stability and reactivity
	of their macromolecules and aggregates – 2018 Project
	Competition of fundamental scientific research carried out
	by young scientists (My first grant) (Role – performer).
	6. Grant of the President of the Russian Federation 2016-
	2017 MD – 5019.2016.8 (1.1676.2016) "Development of
	the scientific foundations of resource–efficient technology
	for processing paraffins extracted in the production of
	low-setting fuels through their integrated use as raw
	materials and the production of synthetic detergents"
	(executive role).
	7. Grant of the President of the Russian Federation 2016-
	2017 for state support of the leading scientific schools of

the Russian Federation (NS - 2016 Competition) (executive role).

## **Business contracts**

- 8. Agreement 13.07-253/2020 dated 28.08.2020 with LLC "Automatika-Service" (2020-2020) "Development of a solution for monitoring the state of catalytic systems" (MVP stage)", in terms of performing research work on the creation of a mathematical model of the activity of a diesel fuel hydrotreating catalyst (using the example of the L - 24/6 installation of PJSC Slavneft - JANOS")", 1 million rubles. (Role – supervisor).
- 9. Contract 13.07-188/2020u dated 01.07.2020 with Gazpromneft Lubricants LLC (2020-2020) "Mathematical modeling of the process of sulfonation of alkylbenzenes", 0.4 million rubles. (Role - performer,)
- 10. Agreement 13.07-495/2019 dated 29.11.2019 with LLC "Automatika-service" (2019-2019) "Creation of a scalable system of adaptive models of technological objects of the refinery. Prototype of the diesel fuel hydrotreating unit", 1 million rubles. (Executive role, combined the role of the head).

List of the topics offered for the prospective scientific research

Mathematical modeling of catalytic processes of processing of petroleum raw materials (reforming, isomerization, alkylation, hydrotreating) in order to obtain components of gasoline

Техника и технологии 2.04. Химические технологии, Химические технологии и промышленность

Supervisor's research interests (detailed description of research interests): Simulation of decontamination of the catalyst surface by coke, as well as by catalytic poisons.

Development of mathematical models as a basis for digital counterparts of catalytic processes of processing of petroleum raw materials

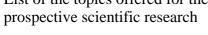
Supervisor's specific requirements:

- Basic programming skills in a high-level language (Python)
- Knowledge of the basics of object-oriented programming

Supervisor's main publications

Total of 25 publications

- Vorobev, A., Antonov, A., Nazarova, G., Ivashkina, E., Ivanchina, E., Chuzlov, V. and Kaliyev, T. (2022), Development of a Two-Fluid Hydrodynamic Model for a Riser Reactor. Chem. Eng. Technol., 45: 709-716. https://doi.org/10.1002/ceat.202100596
- Modeling of motor gasoline components complex production / E. D. Ivanchina, V. A. Chuzlov, E. N. Ivashkina [et al.] // Catalysis Today . — 2021 . — Vol. 378 . — [P. 211-2018].
- Formation of the component composition of blended hydrocarbon fuels as the problem of the multi-objective optimization / E. D. Ivanchina, E. N. Ivashkina, V. A. Chuzlov [et al.] // Chemical Engineering Journal . — 2020 . — Vol. 383 . — [121283, 9 p.].
- Chuzlov, V., Nazarova, G., Ivanchina, E., Ivashkina, E., Dolganova, I., & Solopova, A. (2019). Increasing the economic efficiency of gasoline production: Reducing the quality





Research supervisor:

Vyacheslav A. Chuzlov,

Candidate of Science Institute of Petroleum Chemistry, Siberian Division of the Russian Academy Sciences)

giveaway and simulation of catalytic cracking and compounding. Fuel Processing Technology, 196.
https://doi.org/10.1016/j.fuproc.2019.106139 • Chuzlov, V. A., Nazarova, G. Y., Dolganov, I. M., Dolganova,
I. O., & Zh. Seitenova, G. (2019). Calculation of the optimal
blending component ratio by using mathematical modeling method. Petroleum Science and Technology, 37(10).
https://doi.org/10.1080/10916466.2019.1578800