


**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 the educational program for which the applicant will be accepted	2.6.12 - Chemical technology of fuels and high-energy substances
List of research projects of the potential supervisor (participation/leadership)	<p>Grants</p> <ol style="list-style-type: none"> <li>1. Grant of the President of the Russian Federation 2022-2023 "Improving the efficiency of catalytic processing of gasoline fractions into high-octane components of gasoline with improved environmental characteristics" (Role - leader).</li> <li>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).</li> <li>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).</li> <li>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).</li> <li>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).</li> <li>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).</li> <li>7. Grant of the President of the Russian Federation 2016-2017 for state support of the leading scientific schools of</li> </ol>

	<p>the Russian Federation (NS - 2016 Competition) (executive role).</p> <p>Business contracts</p> <p>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).</p> <p>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,)</p> <p>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).</p>
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
 <p>Research supervisor: Vyacheslav A. Chuzlov, Candidate of Science (The Institute of Petroleum Chemistry, Siberian Division of the Russian Academy of Sciences)</p>	<p>Техника и технологии 2.04. Химические технологии, Химические технологии и промышленность</p> <p>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</p> <p>Supervisor’s specific requirements:</p> <ul style="list-style-type: none"> <li>• <i>Basic programming skills in a high-level language (Python)</i></li> <li>• <i>Knowledge of the basics of object-oriented programming</i></li> </ul> <p>Supervisor’s main publications Total of 25 publications</p> <ul style="list-style-type: none"> <li>• 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. <a href="https://doi.org/10.1002/ceat.202100596">https://doi.org/10.1002/ceat.202100596</a></li> <li>• 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].</li> <li>• 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.].</li> <li>• Chuzlov, V., Nazarova, G., Ivanchina, E., Ivashkina, E., Dolganova, I., &amp; Solopova, A. (2019). Increasing the economic efficiency of gasoline production: Reducing the quality</li> </ul>

	<p>giveaway and simulation of catalytic cracking and compounding. Fuel Processing Technology, 196. <a href="https://doi.org/10.1016/j.fuproc.2019.106139">https://doi.org/10.1016/j.fuproc.2019.106139</a></p> <ul style="list-style-type: none"><li>• Chuzlov, V. A., Nazarova, G. Y., Dolganov, I. M., Dolganova, I. O., &amp; Zh. Seitenova, G. (2019). Calculation of the optimal blending component ratio by using mathematical modeling method. Petroleum Science and Technology, 37(10). <a href="https://doi.org/10.1080/10916466.2019.1578800">https://doi.org/10.1080/10916466.2019.1578800</a></li></ul>
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