


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

University	Tomsk Polytechnic University
Level of English proficiency	B1
Educational program and field of the educational program for which the applicant will be accepted	<i>2.6.12 Chemical technology of fuels and high-energy substances</i>
List of research projects of the potential supervisor (participation/leadership)	<ul style="list-style-type: none"> <li>- Pyrolysis of polymer waste</li> <li>- Infrared pyrolysis of biomass</li> <li>- Complex recycling of waste tires</li> <li>- Thermal production of carbon sorbents from industrial waste</li> <li>- Increasing the efficiency of solid fuel combustion</li> </ul>
List of the topics offered for the prospective scientific research	<ul style="list-style-type: none"> <li>- Infrared carbonization of biomass to produce activated carbon</li> <li>- Development of a solid fuel combustion modifier based on metal rolling mill waste</li> <li>- Reduction of anthropogenic impact on the environment when burning organic fuels</li> <li>- Extraction of valuable components from liquid hydrocarbons from the pyrolysis of waste tires</li> <li>- Demineralization and desulfurization of the carbon residue from the pyrolysis of waste tires</li> <li>- Pyrolysis of polymer waste to produce liquid hydrocarbons</li> <li>- Electric arc gasification of liquid hydrocarbons to produce hydrogen-enriched synthesis gas and dispersed carbon material</li> </ul>
<div style="text-align: center;">  </div> <p>Research supervisor: Kirill B. Larionov, Candidate of Science (Tomsk Polytechnic University)</p>	<p><b>ENERGY &amp; FUELS</b></p> <ul style="list-style-type: none"> <li>- Catalytic combustion: development of catalytic additives that initiate combustion processes of energy fuel in boiler units.</li> <li>- Production of useful products with high added value by thermal conversion of carbon-containing materials.</li> <li>- Production of hydrogen by gasification of organic fuel.</li> <li>- Improvement of the characteristics of carbon obtained from industrial waste by thermal conversion.</li> <li>- Research of combustion processes of liquid hydrocarbons obtained as a result of thermal conversion of industrial and solid municipal waste.</li> </ul>
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	<p>Mastering and obtaining primary skills in the following disciplines:</p> <ul style="list-style-type: none"> <li>- Heat engineering</li> <li>- Processes and apparatuses of chemical technology</li> </ul>
	<p><b>Number of publications over the last 5 years in journals indexed by:</b></p> <p>Scopus – 68 Web of Science – 50 RSCI – 94</p> <p><b>The most significant publications:</b></p> <p>1. Povalyaev P.V., Asilbekov A.K., Kaltaev A.Zh., Vlasov A.V., Slyusarsky K.V., Pak A.Ya., Larionov K.B. Electric arc pyrolysis of</p>

	<p>different fractions derived from waste tire pyrolysis oil // Journal of Analytical and Applied Pyrolysis. 2023. V. 175, 106195. doi: 10.1016/j.jaap.2023.106195 <a href="https://www.sciencedirect.com/science/article/pii/S016523702300339X">https://www.sciencedirect.com/science/article/pii/S016523702300339X</a></p> <p>2. Larionov K.B., Mishakov I.V., Gorshkov A.S., Kaltaev A.Zh., Asilbekov A.K., Gubin A.V., Slyusarsky K.V., Gerasimov R.D., Vedyagin A.A. Activation of the combustion of low-reactivity solid fuels with metal-rolling production waste // Energy. 2023. V. 278, Part B. 128009 doi: 10.1016/j.energy.2023.128009 <a href="https://www.sciencedirect.com/science/article/pii/S0360544223014032">https://www.sciencedirect.com/science/article/pii/S0360544223014032</a></p> <p>3. Larionov K.B., Slyusarskiy K. V., Kirgina M. V., Gvozdyakov D. V., Zenkov A. V., Bogdanov I.A., Kaltaev A.Z., Gubin V.E. The complex research on the technical conditions of energy application of wood pyrolysis bio-oil // Energy, Ecol. Environ. 2022. V. 7, № 4. P. 393–407. doi: 10.1007/s40974-022-00247-4 <a href="https://doi.org/10.1007/s40974-022-00247-4">https://doi.org/10.1007/s40974-022-00247-4</a></p> <p>4. Larionov K.B., Slyusarskiy K. V., Ivanov A.A., Mishakov I. V., Pak A.Y., Jankovsky S.A., Stoyanovskii V.O., Vedyagin A.A., Gubin V.E. Comparative analysis of the characteristics of carbonaceous material obtained via single-staged steam pyrolysis of waste tires // J. Air Waste Manage. Assoc. 2022. V. 72, № 2. P. 161–175. doi: 10.1080/10962247.2021.2010619 <a href="https://doi.org/10.1080/10962247.2021.2010619">https://doi.org/10.1080/10962247.2021.2010619</a></p> <p>5. Larionov K.B., Slyusarskiy K. V., Kirgina M. V., Gvozdyakov D. V., Bogdanov I.A., Zenkov A. V., Yankovsky S.A., Gubin V.E. Liquid Hydrocarbons Production by the Steam Pyrolysis of Used Tires: Energy Characteristics and Environmental Sustainability // Waste and Biomass Valorization. 2022. V. 13, № 4. P. 2233–2251. doi: 10.1007/s12649-021-01628-2 <a href="https://doi.org/10.1007/s12649-021-01628-2">https://doi.org/10.1007/s12649-021-01628-2</a></p>
	<p>Results of intellectual activity</p> <ul style="list-style-type: none"> <li>- Patent for invention No. 2749373 dated 06/09/2021 "Solid fuel combustion modifier"</li> <li>- Patent for invention No. 2817532 dated 04/16/2024 "Composite solid fuel".</li> <li>- Patent No. 2782062 "Two-component organic fuel based on coal and liquid hydrocarbons"</li> <li>- Patent for invention No. 2817493 dated 04/16/2024 "Device for processing carbon-containing waste".</li> <li>- Patent for invention No. 2799204 dated 07/04/2023 "Method for demineralization of carbon residue from pyrolysis of used tires".</li> <li>- Patent for invention No. 2780072 dated 19.09.2022 "Device for processing rubber crumb from worn-out automobile tires".</li> <li>- Patent for invention No. 2812724 dated 01.02.2024 "Installation for complex processing of worn-out tires of rubber products".</li> </ul>