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	National Research Tomsk Polytechnic University
Level of English proficiency	C1- advanced
Educational program and field of the educational program for which the applicant will be accepted	1.3.8. Condensed matter physics (physical sciences) 1.4.4. Physical chemistry (chemical sciences) 2.2.12. Devices, systems and products for medical purposes (2.2 Electronics, photonics, instrumentation and communications) 2.6.6. Nanotechnology and nanomaterials (Chemical technology, materials science, metallurgy) 2.6.14. Technology of silicate and refractory non-metallic materials (Chemical technology, materials science, metallurgy)
List of research projects of the potential supervisor (participation/leadership)	**Participation**: - Russian Science Foundation. Project "Research on ways to improve the piezoelectric properties of biomaterials based on polyoxyalkanoates for controlled effects on living cells and tissues" (project number No. 20-63-47096) - Megagrant. Project "Piezo- and magnetoelectric biocompatible materials for solving problems of modern biology and medicine", agreement number 075-15-2021-588 dated 06/1/2021. - Russian Science Foundation. Project "Development of new additively synthesized alloys with controlled Young's modulus and nanostructured bioactive coating for replacing bone defects" (project number 22-43-04430) **Principal Investigator**: - Russian Science Foundation. Project "Preparation and study of hybrid biodegradable piezoelectric scaffolds with magnetic properties (project number 22-13-20043)
List of the topics offered for the prospective scientific research	1. Piezoelectric (lead-free) ceramics for microelectronics 2. Magnetoelectric materials for microelectronics 3. Modeling the stress-strain behavior of metamaterials using the finite element method. 4. Additive methods for producing piezopolymer scaffolds and implants for tissue engineering. 5. Two-dimensional materials for neuromorphotropic artificial intelligence systems. 6. Development and research of new composite materials based on magnetite and two-dimensional graphene oxide. 7. Three-dimensional printing of composite metamaterials for flexible robotics. 8. Development and research of new types of magnetoelectric memristors for artificial synapses. 9. First-principles calculations of polarization in magnetoelectric and piezoelectric materials and heterostructures
	Title (indicate the relevant research subject area as per the Global Map of Science) Natural and exact sciences 1.03. Physics and Astronomy, Physics - interdisciplinary
	Supervisor's research interests: *Ferroelectrics, magnetoelectric materials, implants, tissue engineering, surface modification, piezoresponse, piezoforce microscopy, scaffolds, piezomaterials, flexible electronics, flexoelectric effect, metamaterials.*

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<tr>
<td rowspan="3"> 
Surmenev Roman Anatolievich,

Doctor of Technical Sciences (Institute of Physics of Strength and Materials Science SB RAS, Tomsk), professor.</td>
<td>Research highlights:
The use of advanced equipment, interaction with Russian and foreign scientists and research centers, financial support for graduate students.</td>
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<tr>
<td>Supervisor’s specific requirements:
Fluency in English, Q1/Q2 publications, motivation for results, ability to work in an interdisciplinary team, creative approach.</td>
</tr>
<tr>
<td>Supervisor’s main publications.
Author and co-author of more than 170 publications indexed in Scopus. H-index 38 (Scopus), 37 (Web of Science).
1 R.A. Surmenev, M.A. Surmeneva. The influence of the flexoelectric effect on materials properties with the emphasis on photovoltaic and related applications: a review, Materials Today 67 (2023) 256-298, https://doi.org/10.1016/j.mtcomm.2023.106410
2 S. Kopyl, R. Surmenev, M. Surmeneva, Y. Fetisov, A. Kholkin, Magnetoelectric effect: principles and applications in biology and medicine – A review, Materials Today Bio 12 (2021) 100149, https://doi.org/10.1016/j.mtbio.2021.100149
3 R.A. Surmenev, R.V. Chernozem, I.O. Pariy, M.A. Surmeneva, A review on piezo- and pyroelectric responses of flexible nano- and micropatterned polymer surfaces for biomedical sensing and energy harvesting applications, Nano Energy 79 (2021) 105442, https://doi.org/10.1016/j.nanoen.2020.105442
4 A. Pryadko, Y.R. Mukhortova, V.V. Botvin, I.Y. Grubova, M.R. Galstenkova, D.V. Wagner, E.Y. Gerasimov, E.V. Sukhinina, A.G. Pershina, A.L. Kholkin, M.A. Surmeneva, R.A. Surmenev. A comprehensive study on in situ synthesis of magnetic nanocomposite of magnetite/reduced graphene oxide and its effect on arsenic removal from water, Nano-Structures & Nano-Objects 35 (2023) 101028, https://doi.org/10.1016/j.nanoso.2023.101028
5 R.V. Chernozem, I. Pariy, M.A. Surmeneva, V.V. Shvartsman, G. Plankaert, J. Verduijn, S. Ghysels, A. Abalymov, B.V. Parakhonskiy, A. Gonçalves, S. Mathur, F. Ronsse, D. Depla, D.C. Lupascu, D. Elewaut, R.A. Surmenev, A.G. Skirtach, Cell behavior changes and enzymatic biodegradation of hybrid electrospun poly(3-hydroxybutyrate)-based scaffolds with an enhanced piezoresponse after the addition of reduced graphene oxide, Adv. Healthcare Mater. 12 (2023) 2201726, https://doi.org/10.1002/adhm.202201726</td>
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<tr>
<td></td>
<td>Results of intellectual activity:
3 Russian Federation patents for invention and 1 for utility model.</td>
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