Приложение № 2

Структура научного профиля (портфолио) потенциальных научных руководителей участников Международной олимпиады Ассоциации «Глобальные университеты» по треку аспирантуры в 2023-2024 гг.

Университет	**Kazan (Volga region) Federal University**
Уровень владения английским языком	**Pre-Intermediate**
Направление подготовки, на которое будет приниматься аспирант	**Physics and astronomy**
Перечень исследовательских проектов потенциального научного руководителя (участие/руководство)	• **Dielectric spectroscopy and kinetics of complex systems (Project 12–18 02 0210 21000018, Ministry of Education and Science of the Russian Federation, 2012-2013, participation)** • **Axiomatic design of nucleon systems: study of general properties in the representation of superselection rules (Project 13-02-97054, RFBR, 2013-2014, participation)** • **Synthesis, experimental study and modeling of new functional materials and nanostructures for quantum technologies (Project 14-58, Ministry of Education and Science of the Russian Federation, 2014-2016, participation)** • **Structures with a distributed order parameter, State. assignment of the Ministry of Education and Science of the Russian Federation project. part (2017-2019, participation)**
Перечень возможных тем для исследования	**Theory of ion transport in new generation electrolytes**
 Research supervisor: Airat A. Khamzin, Candidate of Science (Kazan State University)	**Dielectric and transport properties of disordered media** Supervisor's research interests: **Theory of dielectric response and conductivity of complex systems**. **Correlation effects in the ionic conductivity of ionic liquids and electrolytes**. Research highlights (при наличии): **The program is being implemented in collaboration with the Oakridge National Laboratory (Oakridge, Tennessee, USA).** Supervisor's specific requirements: • **Statistical mechanics, electrodynamics, quantum mechanics** • **Theory of electric polarization and conductivity of condensed matter** • **Mathematical analysis** • **Methods of multi-parameter data fitting, statistical data analysis** • **Application programs for engineering computing calculations**

	Supervisor's main publications: • **Popov I., Khamzin A., Matsumoto R. A., Zhao W., Lin X., Cummings P. T., Sokolov A. P.. Controlling the Ion Transport Number in Solvent-in-Salt Solutions //The Journal of Physical Chemistry B. – 2022.-T. 126. – C. 4572-4583** • **Khamzin A. A., Nikitin A. S. Ion trapping model of the ac conductivity in disordered solids //Journal of Physics Condensed Matter. – 2022. – T. 34. – №. 4. – C. 045201.** • **Khamzin A. A., Nasybullin A. I., Nikitin A. S. Theoretical description of dielectric relaxation of ice with low concentration impurities //Chemical Physics. – 2021. – T. 541. – C. 111040.** • **Khamzin A. A., Nikitin A. S. Trap-controlled fractal diffusion model of an atypical dielectric response //Chemical Physics. – 2021. – T. 547. – C. 111163.** • **Popov I., Carroll B., Bocharova V., Genix A. C., Cheng S., Khamzin A., KisliukA., Sokolov A. P. Strong reduction in amplitude of the interfacial segmental dynamics in polymer nanocomposites //Macromolecules. – 2020. – T. 53. – №. 10. – C. 4126-4135.**
	Results of intellectual activity (при наличии) • **A microscopic theory of the dielectric relaxation of water in liquid and solid states is developed. (Построена микроскопическая теория диэлектрической релаксации воды в жидком и твердом состояниях).** • **A general theory of anomalous dielectric relaxation of disordered media is developed. (Построена общая теория аномальной диэлектрической релаксации неупорядоченных сред)** • **Theory of AC conductivity of disordered media is developed. (Построена теория AC проводимости неупорядоченных сред)**