


University	Peter the Great St.Petersburg Polytechnic University
Level of English proficiency	C1 (Advanced)
Educational program and field of the educational program for which the applicant will be accepted	<p>CHEMISTRY & MATERIAL SCIENCE</p> <p>2.6.1. Metal science and heat treatment of metals and alloys</p> <p>2.6.4. Metal forming</p> <p>2.6.17. Material science</p> <p>ENGINEERING & TECHNOLOGY</p> <p>2.5.8. Welding, related processes and technologies</p>
List of research projects of the potential supervisor (participation/leadership)	<ul style="list-style-type: none"> • The Grant of President of Russian Federation for young PhD in technical science 2012-2013. MK--6134.2012.8 "Hot rolling technology for high-strength automotive dual-phase steel DP-1000 development with the help of physical and numerical simulation". Head of the project. • Federal program, agreement №14.B37.21.1101, Research and numerical simulation of microstructure and failure mechanisms formation of high purity nano crystalline Be during plastic deformation and heat treatment, 2012-2013. Project participant. • Grant British Petroleum for the group headed by young PhD in technical science 2013. "Chemical composition of pipeline steels strength category X70 и X80 optimization". Head of the project. • The Grant of President of Russian Federation for young PhD in technical science 2014-2015. MK-4231.2014.8 "Influence of severe plastic deformation during friction stir welding on weldability of welds with the help of physical and numerical simulation". Head of the project. • Grant British Petroleum for the group headed by young PhD in technical science 2014. "Hot rolling technology for lean-alloyed pipeline steel X80 development on continuous rolling mill 2000". Head of the project. • Mega-grant of Ministry of education and science in terms of the order of the Government of Russian Federation №220, agreement №14.Z50.31.0018, senior researcher at the Laboratory of Lightweight materials and structures. Project participant. • The Grant of President of Russian Federation for young PhD in technical science 2016-2017. MK-7840.2016.8 "The microstructure and properties behavior of Al alloys during friction stir processing and welding". Head of the project. • Federal program, agreement №14.575.21.0155, Development of scientific and technological basics for digital production of industrial scale products made of Al alloys by means of wire and arc additive manufacturing and subsequent joining by friction stir welding, 2017-2019. Project participant.
List of the topics offered for the prospective scientific research	<ul style="list-style-type: none"> • Optimization of Friction Stir Welding and Processing techniques to increase the quality of the joints and productivity of the process for aluminium alloys

	<ul style="list-style-type: none"> • Optimization of Friction Stir Welding and Processing techniques to increase the productivity of the process for aluminium alloys • Optimization of Friction Stir Welding technique to increase the quality of the dissimilar materials joints • Synthesis of composite materials by means of Friction Stir Processing • Development of Friction Stir Spot Welding techniques for aluminium alloys.
 <p>Research supervisor: Anton A. Naumov, PhD, Associate Professor</p>	<p>2.11. Other engineering and technologies</p>
	<p>Supervisor's research interests</p> <ul style="list-style-type: none"> • Optimization of Friction Stir Welding and Processing techniques to increase the quality of the joints and productivity of the process for aluminium alloys • Finite element modeling of the Friction Stir Welding process • Physical simulation techniques development for metal plastic deformation processing • Thermomechanical processing of metallic materials • Friction Stir Welding of dissimilar materials
	<p>Research highlights</p> <p>Research in the field of Friction Stir Welding will be provided on the unique technological and scientific equipment: 5-axis FSW machine with the options for Impulse and High-Speed FSW; thermomechanical simulator Gleeble-3800; supercomputer.</p>
	<p>Supervisor's specific requirements:</p> <ul style="list-style-type: none"> • Basic knowledge and experience in Friction Stir Welding/Processing; • Experience in Finite Element/Volume modeling (Ansys, Abaqus, Deform); • Basic knowledge in Metallic Materials Science.
	<p>Supervisor's main publications</p> <ul style="list-style-type: none"> • Naumov, A., Morozova, I., Rylkov, E., Obrosof, A., Isupov, F., Michailov, V., & Rudskoy, A. (2019). Metallurgical and mechanical characterization of high-speed friction stir welded AA 6082-T6 aluminum alloy. <i>Materials</i>, 12(24) doi:10.3390/MA12244211; • Isupov, F. Y., Panchenko, O. V., Naumov, A. A., Alekseeva, M. D., Zhabrev, L. A., & Popovich, A. A. (2019). Consumable tool for coating deposition by joint deformation of the base and tool materials. <i>Russian Metallurgy (Metally)</i>, 2019(13), 1399-1406. doi:10.1134/S0036029519130111; • Naumov, A. A., Isupov, F. Y., Golubev, Y. A., & Morozova, Y. N. (2019). Effect of the temperature of friction stir welding on the microstructure and mechanical properties of welded joints of an al - cu - mg alloy. <i>Metal Science and Heat Treatment</i>, 60(11-12), 695-700. doi:10.1007/s11041-019- 00342-0; • Ryl'kov, E. N., Isupov, F. Y., Naumov, A. A., Panchenko, O. V., & Shamshurin, A. I. (2019). Microstructure and mechanical properties of dissimilar al - cu joints formed by friction stir

	<p>welding. Metal Science and Heat Treatment, 60(11-12), 734-738. doi:10.1007/s11041-019-00348-8;</p> <ul style="list-style-type: none"> • Ryl'kov, E. N., Isupov, F. Y., Naumov, A. A., Panchenko, O. V., & Zhabrev, L. A. (2019). Comparative analysis of the mechanical properties of the friction stir welding joints of various aluminum alloys. Russian Metallurgy (Metally), 2019(13), 1531-1536. doi:10.1134/S0036029519130329 • Morozova, I., Obrosof, A., Naumov, A., Weiß, S., Michailov, V. Impact of impulses on microstructural evolution and mechanical performance of al-mg-si alloy joined by impulse friction stir welding, Materials, 2021, 14(2), pp. 1–16, 347 • Naumov, A., Isupov, F., Rylkov, E., Amancio-Filho, S.T., Panchenko, O. Microstructural evolution and mechanical performance of Al-Cu-Li alloy joined by friction stir welding, Journal of Materials Research and Technology, 2020, 9(6), pp. 14454–14466
	<p>Results of intellectual activity</p> <ul style="list-style-type: none"> • Patent № RU 2460809 C1 "Methods of microalloyed steels thick sheets production". • Patent № RUS 2624613 "Methods for materials testing by tension-compression technique and the sample geometry". • Patent № RUS 183279 "Consumable tool for coating deposition by means of tool and substrate materials deformation".