На английском языке:

University	Kazan Federal University
Level of English proficiency	Advanced
Educational program and field of the educational program for which the applicant will be accepted	Condensed Matter Physics
List of research projects of the potential supervisor (participation/leadership)	1. RFBR grant No. 17-02-00953 “Models of the magnetic structure of low-dimensional magnets using the example of weakly interacting spin chains and zigzag walls”, leader 2. RFBR grant No. 18-52-06011 (together with Azerbaijan) “Magnetic and transport properties of dilute manganites of the La1-cSrcMn1-x-yFex(Mg,Zn)yO3 system, c<0.35, x+y=0.1”, supervisor 3 RSF Grant No. 16-12-00041 “Isotopically pure impurity crystals for quantum memory”, (2016-2020) responsible executor 4. RSF 22-42-02014 “Double oxides of the perovskite type for the production of thermoelectric energy” Competition 2021 “Carrying out fundamental scientific research and exploratory research by international scientific teams" (DST), head
List of the topics offered for the prospective scientific research	Magnetic phase transitions in double perovskites Sr2Me’Me’’O6; On the theory of electric fields on 4f electrons in rare-earth oxide compounds, taking into account the spatial distribution of charges on oxygen
 Research supervisor: Eremina R.M. Professor, KFU / Institute of Physics / Department of Physics / Department of General Physics, Doctor of Science Zavoisky Physical-Technical Institute, Kazan Scientific Center of RAS	*1.03. Physics and Astronomy, Condensed Matter Physics* Supervisor’s research interests *magnetic resonance, magnetic susceptibility, thin films, ferromagnetic clusters, multiferroics, quasi-one-dimensional magnets, anisotropic exchange interactions, crystal field parameters* Research highlights *Collaboration with Department of Materials Science and Engineering Indian Institute of Technology Kanpur, UP 208016, India Department of MSE IIT Kanpur, India* Supervisor’s specific requirements: *Master of Physics or Radiophysics* Supervisor’s main publications *1.EPR spectroscopy of Cr-53 monoisotopic impurity ions in a single crystal of yttrium orthosilicate Y2SiO5 / V.F. Tarasov, I.V. Yatsyk, R.F. Likerov, A.V. Shestakov, R.M. Eremina, Yu.D. Zavartsev, S.A. Kutovoi // OPTICAL MATERIALS.-2020.-v.105.-p.109913* *https://doi.org/10.1016/j.optmat.2020.109913* *(Impact= 2.779) Q1* *2. EPR Spectroscopy of 53Cr3+ Monoisotopic Impurity Ions in a Single Crystal of Scandium Orthosilicate Sc2SiO5 / V. F. Tarasov, R. M. Eremina, K. B. Konov, R. F. Likerov,· A. V. Shestakov, Yu. D. Zavartsev,· S. A. Kutovoi // Applied Magnetic Resonance.-2021-V. 52, p.5–14.* *https://doi.org/10.1007/s00723-020-01225-x*

	https://doi.org/10.1016/j.jallcom.2020.158365 (Impact= 4.650) Q1 *3. Destruction of long-range magnetic order in an external magnetic field and the associated spin dynamics in Cu2GaBO5 and Cu 2 AlBO 5 ludwigites / Kulbakov, A. A., Sarkar, R., Janson, O., Dengre, S., Weinhold, T., Moshkina, E. M., P. Y. Portnichenko, H. Luetkens, F. Yokaichiya, A. S. Sukhanov, R. M. Eremina, Ph. Schlender, A. Schneidewind, H.-H. Klauss, Inosov, D. S. // Physical Review B. – 2021. – T. 103. – №. 2. – C. 024447* *https://doi.org/10.1103/PhysRevB.103.024447* *(Impact= 3.575) Q1* *4. Iron oxidation state in La0. 7Sr1. 3Fe0. 7Ti0. 3O4 and La0. 5Sr1. 5Fe0. 5Ti0. 5O4 layered perovskites: Magnetic properties / Gavrilova, T. P., Yagfarova, A. R., Deeva, Y. A., Yatsyk, I. V., Gilmutdinov, I. F., Cherosov, M. A., Vagizov, F.G., Chupakhina, T.I., Eremina, R. M. // Journal of Physics and Chemistry of Solids. – 2021. – T. 153. – C. 109994.* *https://doi.org/10.1016/j.jpcs.2021.109994* *(Impact= 3.442) Q2* *5. Spin relaxation in Cs2CuCl4− xBrx / HassanAbadi, R., Eremina, R. M., Hemmida, M., Dittl, A., Eremin, M. V., Wolf, B., W. Assmus, A. Loidl, Krug von Nidda, H. A. // Physical Review B. – 2021. – T. 103. – №. 6. – C. 064420* *https://doi.org/10.1103/PhysRevB.103.064420* *(Impact= 3.575) Q1*
	Results of intellectual activity The quantum chain with spin S=1/2 Cs2CuCl4 is of great interest due to the competing antiferromagnetic intrachain J and interchain exchange J' interactions and represents the most important example of Bose–Einstein magnon condensation. The replacement of chlorine with bromine leads to a change in competing exchange interactions and corresponding magnetic frustrations. Thus, anisotropic exchange contributions may be decisive for the realization of the ground state. We studied Cs2CuCl4−xBrx single crystals using the electron spin resonance (ESR) method in order to analyze the evolution of these anisotropic exchange contributions [Physical Review B. - 2021. - V. 103. - p. 064420]. The main source of EPR line broadening is due to the homogeneous Dzyaloshinsky-Moriya interaction. The vector components of the Dzyaloshinsky-Moriya interaction are determined from the angular dependence of the EPR spectra in the high-temperature approximation. Quantum spin systems Cu2M'BO5(M'=Al,Ga) with a ludwigite crystal structure consist of a structurally ordered Cu2+ sublattice in the form of three-legged ladders, with a structurally disordered sublattice with a statistically random occupation of the site by magnetic Cu2+ ions and non-magnetic Ga3+ or Al3+ ions [Physical Review B. – 2021. – V. 103. – P. 024447]. Microscopic analysis based on density functional calculations for Cu2GaBO5 reveals a quasi-two-dimensional spin model with five nonequivalent antiferromagnetic exchanges between copper ion spins. In zero magnetic field, antiferromagnetic order is

	established below TN≈4.1 K and ≈ 2.4 K for Ga and Al compounds, respectively. Most notably, the application of a magnetic field above 1 T destroys the static long-range order, which manifests itself in a gradual broadening of the magnetic Bragg peaks. We argue that the system exhibits a transition from a magnetically long-range ordered state to a spin glass regime in a structurally disordered magnetic sublattice that polarizes in a magnetic field and thus acts as a regulator of field-driven magnetic disorder. The structural and magnetic properties of the multiferroic YbMnO3 and Yb0.82Sr0.18MnO3 were studied by neutron diffraction (NPD), magnetometry and electron spin resonance (ESR) methods in a wide temperature range [Ceramics International, V. 45, 2019, P. 10286-10294]. The replacement of ytterbium ions with strontium ions in the hexagonal h - YbMnO3 (space group P63cm) leads to destabilization of the crystal structure of the latter compound and the appearance of a mixture of three phases with different structures: the hexagonal phase h - Yb0.95Sr0.05MnO3 (space group P63cm), the orthorhombic phase o- Yb0.69Sr0.31MnO3 (space group Pbnm), hexagonal phase SrMnO3 (space group P63cm). This fact was confirmed by EPR measurements, in which several signals due to phases of different structures were observed. EPR and magnetization measurements of the h-YbMnO3 sample proved the presence of antiferromagnetic correlations and also showed the presence of ferromagnetic correlated nanoregions.