

ITMO University
The International Research Center
Nanophotonics and Metamaterials
St.Petersburg
Russia

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Kulachenkov Nikita, optical engineer CV

Education

- Sept 2008 – June 2013* **ITMO University**
Engineer (Master's) Degree
Specialization: "Physics and technology of optical communication elements".
Thesis theme: "Development of a device for measurement of angular characteristics of uniaxial platforms for navigational complex testing".
Average score 4.5/5
- Nov 2015 – Jan 2016* **Peter the Great St. Petersburg Polytechnic University**
Quantum electronics devices course
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Work experience

- July 2018 – Present* **Optical engineer**
ITMO University
The International Research Center Nanophotonics and Metamaterials
- Experimental investigation under the joint Russian-French project «Hybrid photonic nanostructures»:
- Optical experiments with nanoparticles, MOF crystals, films (transmittance/reflectance/scattering, second harmonic generation, Raman spectroscopy);
 - Experimental setups construction based on Yb-crystal femtosecond laser, CW He-Ne, confocal Raman spectrometry;
 - Tuning optical systems based on femtosecond laser: pulse-picker, SHG, THG;
 - Synthesis of nanoparticles by plasma in liquid nitrogen and laser ablation methods;
 - General lab. maintenance of optical equipment in working conditions: adjustment of the cooling system for CMOS cameras and lasers, calibration of Raman spectroscopy system, piezo scan system tuning;
 - Performing of the experiments in collaboration with the Institute Jean Lamour, Nancy, France and ETH University Zurich, Switzerland.

May 2017 – Aug 2017 **Junior Specialist**

University of California Irvine, MicroSystems Lab
Irvine, USA

Nuclear Magnetic Resonance Gyroscope (NMRG) project. Development and fabrication of glassblowing spherical micro-cells for NMRG:

- Fabricated sensitive element of Nuclear magnetic resonance gyro using MEMS technology;
- Implemented setup for experimental investigation by methods of NMR, EPR and pump-probe spectroscopy. The setup included laser stabilization system, non-magnetic temperature controller, synchronized detection scheme of atomic spin precession;
- Completed following travelers: “Rb-Xe characterization traveler”, “Laser tuning traveler”, “Cell filling traveler”.

2015-2017 **The conference of young scientists «Navigation and Motion control»**

The member of organization committee

Jan. 2014 – Jun 2018 **Junior Research Fellow**

The State Research Center of the Russian Federation – Concern CSRI
Elektropribor
St. Petersburg, Russia

Development atomic chip-scale devices:

- Implemented quantum magnetometer with laser pumping for measurement residual magnetic fields in compact shielding constructions;
- Performed modelling of magnetic shielding system for atomic chip scale device in ANSYS Magnetostatic;
- Developed optical scheme of atomic chip-scale device in Zemax and ProEngineer;
- Successfully completed the first project phase.

May 2012 – Jan 2014 **Engineer**

The State Research Center of the Russian Federation – Concern CSRI
Elektropribor
St. Petersburg, Russia

The position included development, modeling and support on fabrication stage:

- Developed an optical device for measurement angle movements of the rocking platform (CAD development, adjustment and calibration, realization of working algorithms in Matlab);
 - Developed CAD drawings for metrology measurements and engineering applications (2 successful performed projects)
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Skills & Activities

Skills Optical spectroscopy, NMR/EPR/pump-probe spectroscopy, laser tuning, CAD application software: ProEngineer, AutoCAD, SolidWorks; Matlab, Origin, ANSYS Magnetostatic, Arduino Programming,
Languages Russian, English
Interests Climbing

References

Professor Andrei M. Shkel The head of Microsystems Lab, UC Irvine

E-mail: ashkel@uci.edu

Dr. Anton K. Vershovskii Leading research associate of Atomic RadioSpectroscopy Lab, Ioffe Phys.-Tech. Institute

E-mail: vershovski@gmail.com

Publications

Radwan M Noor, Nikita Kulachenkov, Mohammad H Asadian, Andrei M Shkel *Study on Mems Glassblown Cells for NMR Sensors*. Proceedings - 2019 IEEE International Symposium on Inertial Sensors and Systems (INERTIAL), Naples, FL, USA, April 1 - 5, 2019

Ossadtchi A.E., Kulachenkov N.K., Chuchelov D.S., Dmitriev S.P., Pazgalev A.S., Petrenko M.V., Vershovskii A.K. *Towards magnetoencephalography based on ultrasensitive laser pumped non-zero field magnetic sensor*. Proceedings - International Conference Laser Optics 2018, ICLO 2018 2018. C. 543.

Avanesov Y.L., Angervaks A.E., Gorohovskiy K.S., Granovskiy V.A., Gryazin D.G., Kudryavtsev M.D., Kulachenkov N.K., Ryskin A.I., Scheulin A.S. *Device for measuring instantaneous angular movements of the rocking platform*. Patent RUS №2642975

Kulachenkov N.K., Ermak S.V., Semenov V.V. *The residual magnetic field measurement in compact shielding construction*. 14th International youth school-conference "Magnetic resonance and its applications" 2017

Baranov A.A., Ermak S.V., Sagitov E.A., Semenov V.V., Kulachenkov N.K., Petrenko M.V. *Influence of the dynamic Stark effect on long-term frequency stability of a self-oscillating magnetometer with laser-pumped alkali atoms*. Journal of Physics: Conference Series 2017. T. 929. C. 012067.

Avanesov Y.L., Gorokhovskiy K.S., Granovskii V.A., Kudryavtsev M.D., Kulachenkov N.K., Angervaks A.E., Ryskin A.I., Shcheulin A.S. *Rotation angle measurement device: principle of operation and initial calibration results*. IEEE 11th International Multi-Conference on Systems, Signals and Devices, SSD 2014 2014. C. 6808783.

Suprun A.S., Kulachenkov N.K. *Basic principles of modelling in AutoCAD*. (in Russian) 2013