Maria V. Mukhina

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University of Maryland, Physical Sciences Complex, 4296 Stadium Dr, College Park, MD 20742

EDUCATION

2017	MCB188 Chromosomes, Harvard University, USA Taken unofficially
2010-2013	Ph.D. in Optics, ITMO University, Russia Thesis: Macroscopic orientation of the luminescent semiconductor anisotropic nanocrystals Supervisor: Professor Vladimir G. Maslov
2008-2010	Master in Photonics and Optical Computer Science, ITMO University, Russia Thesis: Luminescent properties of semiconductor and carbon nanoparticles in aqueous solution Supervisor: Professor Anatoly V. Fedorov.
2004-2008	Bachelor in Technical Physics, ITMO University, Russia

POSITIONS

starting 2024	Assistant Professor, Department of Physics, University of Maryland, Physical Sciences Complex, College Park, USA
07.2019 02.2019 09.2018	Visiting Researcher, Laboratory of Prof. Paul Alivisatos, Department of Chemistry, University of California, Berkeley
2016-2023	Postdoctoral Fellow, Laboratory of Prof. Nancy Kleckner, Department of Molecular and Cellular Biology, Harvard University, USA
09-11.2015	Visiting Researcher, Laboratory of Nanoscience and Spectroscopy, School of Chemistry, the University of Manchester, UK
03.2013 03.2014	Visiting Researcher, Laboratory of Inorganic and Materials Chemistry, School of Chemistry, Trinity College Dublin, Ireland
2014-2016	Research Associate, Center of Information Optical Technologies, ITMO University, Russia
2008-2013	Engineer, Center of Information Optical Technologies, ITMO University, Russia

AWARDS

2015-2017	The Scholarship of the President of the Russian Federation for Young Scientists and Graduate Students
2015	ITMO Grant for Young Scientists (Principal Investigator, led the group of 7 people)
2015	Researcher Links Travel Grant

PUBLICATIONS, 5 most important are highlighted ‡

Maria Mukhina. Bringing Chiral Functionality to In Vivo Applications of Nanomaterials. Light: Science & Applications, 11 (157) (2022)
Invited paper

Lingluo Chu, Zheng Zhang, **Maria V. Mukhina**, Denise Zickler, Nancy E. Kleckner. Sister chromatids separate during anaphase in a three-stage program as directed by inter-axis bridges. PNAS, 119 (10), e2123363119 (2022)

‡**Maria V. Mukhina**, Jason S. Tresback, Justin C. Ondry, Austin Akey, A. Paul Alivisatos, and Nancy Kleckner. Single particle studies reveal a new mechanism for elastic, bright, and repeatable ZnS:Mn mechanoluminescence in a low pressure regime. ACS Nano, 15 (3) 4115-4133 (2021)
Highlighted in ACS monthly feature In Nano

‡Lingluo Chu*, Zhangyi Liang*, **Maria Mukhina***, Jay K. Fisher, John Hutchinson, Nancy Kleckner. One-dimensional spatial patterning along mitotic chromosomes: a mechanical basis for macroscopic morphogenesis. PNAS, 117 (43) 26749-26755 (2020)
**These authors contributed equally to this work*

Lingluo Chu, Zhangyi Liang, **Maria Mukhina**, Jay Fisher, Nadine Vincenten, Zheng Zhang, John Hutchinson, Denise Zickler, Nancy Kleckner. The 3D Topography of Mitotic Chromosomes. Molecular Cell, 79, 1–15 (2020)

‡**Maria V Mukhina,** Anvar S Baimuratov, Ivan D Rukhlenko, Vladimir G Maslov, Finn Purcell Milton, Yurii K Gun'ko, Alexander V Baranov, Anatoly V Fedorov. Circular Dichroism of Electric-Field-Oriented CdSe/CdS Quantum Dots-in-Rods. ACS Nano, 10, 8904-8909 (2016)

‡**Maria V Mukhina**, Ivan V Korsakov, Vladimir G Maslov, Finn Purcell Milton, Joseph Govan, Alexander V Baranov, Anatoly V Fedorov, Yurii K Gun'ko. Molecular Recognition of Biomolecules by Chiral CdSe Quantum Dots. Scientific Reports, 6, 24177 (2016)

Finn Purcell-Milton, Joseph Govan, **Maria V Mukhina,** and Yurii K. Gun'ko. The chiral nano-world: chiroptically active quantum nanostructures. Nanoscale Horizons, 1, 14-26 (2016)

Maria V Mukhina, Vladimir G Maslov, Ivan V Korsakov, Finn Purcell Milton, Alexander Loudon, Alexander V Baranov, Anatoly V Fedorov, Yurii K Gun'ko. Optically active II-VI semiconductor nanocrystals via chiral phase transfer. MRS Proceedings, 1793, mrss15-2125910 (2015)

‡**Maria V. Mukhina**, Vladimir G. Maslov, Alexander V. Baranov, Anatoly V. Fedorov, Anna O. Orlova, Finn Purcell-Milton, Joseph Govan, and Yurii K. Gun'ko. Intrinsic Chirality of CdSe/ZnS Quantum Dots and Quantum Rods. Nano Letters, 15 (5), 2844-2851 (2015)

Mícheál P Moloney, Joseph Govan, Alexander Loudon, **Maria Mukhina**, Yurii K Gun'ko. Preparation of chiral quantum dots. Nature Protocols, 10(4) 558-573 (2015)

Igor I. Shaganov, Tatiana S. Perova, **Maria V. Mukhina,** Irina V. Martynenko, Alexander V. Baranov, Anatoly V. Fedorov, Valerie Gerard, Yuri K. Gun'ko. Influence of intermolecular interactions on spectroscopic characteristics of metal nanoparticles and their composites. Physical Chemistry Chemical Physics, 16, 24536 (2014)

M.V. Mukhina, V.G. Maslov, A.V. Baranov, A.V. Fedorov. Selective photochemical reaction in an ensemble of CdSe/ZnS quantum rods. Optical Engineering, 53(8) 087107-(1-6) (2014)

M.V. Mukhina, V.G. Maslov, A.V. Baranov, A.V. Fedorov. Photoinduced polarized luminescence enhancement and darkening in an ensemble of CdSe/ZnS quantum rods. Proceedings of SPIE, 9126 912620-(1-10) (2014)

M.V. Mukhina, V.G. Maslov, A.V. Baranov, M.V. Artemyev, A.V. Fedorov. Anisotropic absorption of CdSe/ZnS quantum rods embedded in polymer film. Advances in Nano Research, 1(3) 153-158 (2013)

M.V. Mukhina, V.G. Maslov, A.V. Baranov, M.V. Artemyev, A.O. Orlova, A.V. Fedorov**.** Anisotropy of optical transitions in ordered ensemble of CdSe quantum rods. Optics Letters, 38(17) 3426-3428 (2013)

M.V. Mukhina, V.G. Maslov, A.V. Baranov, A.V. Fedorov**,** K. Berwick. Photoinduced anisotropy in an ensemble of CdSe/ZnS quantum rods. RSC Advances, 3 20746-20749 (2013)

M.V. Mukhina, V.G. Maslov, A.V. Baranov, A.V. Fyodorov**,** M.V. Artem'ev, A.V. Prudnikov. Anisotropy of light absorbed by an ensemble of CdSe quantum nanoplates. Journal of Optical Technology, 80(10) 642 - 644 (2013)

М.В. Мухина, В.Г. Маслов, А.В. Баранов, А.В. Федоров**.** Фотохимически индуцированная поляризация люминесценции квантовых стержней CdSe/ZnS в пористой матрице. Научно-технический вестник ИТМО, 87(5) 133-139 (2013)

M.V. Mukhina, V.V. Danilov, A.O. Orlova, A.V. Fedorov, M.V. Artemyev, A.V. Baranov. Electrically controlled polarized photoluminescence of CdSe/ZnS nanorods embedded in a liquid crystal template. Nanotechnology, 23(32) 325101(1-6) (2012)

V.V. Danilov, M.V. Artem'ev, A.V. Baranov, A.O. Orlova, **M.V. Mukhina**. Liquid-crystal composites with controlled photoluminescence of CdSe/ZnS semiconductor quantum rods. Optics and Spectroscopy 110 (6), 897-902 (2011)

А.В. Савельева, **М.В. Мухина**, А.О. Орлова, В.Г. Маслов, А.В. Баранов, А.В. Федоров. Спектрально-люминесцентные проявления взаимодействия CdTe квантовых точек с ионами металлов в водном растворе. Научно-технический вестник СПбГУ ИТМО 62(4), 35-41 (2009)

PATENTS

Baranov A., V.; Gunko Ju., K.; Maslov V., G.; Mukhina M., V.; Orlova A., O., Fedorov A., V. Method for Phase-Transfer of Inorganic Colloidal Semiconductor Nanocrystals. *RU2583097C2,* 2014-09-12

RECENT CONFERENCES

2022	Institut Curie, online, France (**invited seminar**)
2022	Mechano-Genomics Seminar Series, online, Switzerland (**talk**)
2021	Cell Bio Virtual 2021 - An Online ASCB|EMBO Meeting, online, USA (**talk**)
2021	EMBL Symposium «Seeing is Believing: Imaging the Molecular Processes of Life», online, Germany (**talk**)
2020	International Titisee Conference on Genome folding: physics and function, online, Germany
2019	MRS Fall Meeting 2019, Boston, MA, USA (poster)
2019	Symposium «The Future of Quantitative Biology» of the Quantitative Biology Initiative, Harvard University, Cambridge MA, USA (poster)
2019	Workshop «Spectral Theory and Mathematical Approaches to Localization» of the Simons collaboration project «Localization of Waves», Ecole Polytechnique, Paris, France
2016	PCNSPA Conference 2016 - Photonic Colloidal Nanostructures: Synthesis, Properties, and Applications, Saint Petersburg, Russia (**talk**)
2015	Workshop «Nanoscale Assemblies of Semiconductor Nanocrystals, Metal Nanoparticles and Single Molecules: Theory, Experiment and Application», Max-Planck-Institut für Physik komplexer Systeme, Dresden, Germany (**talk**)
2015	MRS Spring Meeting 2015, San Francisco, CA, USA (**talk**)
2014	Nanocon 2014, Brno, Czech Republic (poster)
2014	Science of the Future, Saint Petersburg, Russia (poster)
2014	SPIE Photonics Europe 2014, Brussels, Belgium (poster)
2013	2013 World Congress on Advances in Nano, Biomechanics, Robotics, and Energy Research, Soul, South Korea (**talk**)

TEACHING

2021	Guest lecture “Dynamics of Bacterial Chromosome”, Harvard MCB294
2018	“Interesting Questions in Physical Biology”

REVIEWER

Nano Letters, ACS Nano, Chirality, Journal of Materials Chemistry C, Journal of Physical Chemistry, Science Advances, Journal of Materials Chemistry C, Chemistry of Materials, Nano Research, Analytica Chimica Acta, Materials Advances, Scientific Reports, Laser and Photonics Reviews, Advanced Optical Materials

OUTREACH

Science Mentoring Workshop Intensives for postdoctoral fellows who are mentoring Harvard undergraduates in the laboratory (2021)

Mentor at The Science Mentors, the program supports junior scholars by connecting them to their more senior colleagues all around the world (18 countries) in mentor-mentee pairs, since 2021

Volunteer at Sena Institute of Technology (SIT), the first private nonprofit research center dedicated to fundamental science in Ghana, since 2017; speaker at SIT African Seminar Series (2021)

Member of FAS Postdoctoral Association; after having a baby, I turned into an advocate for affordable childcare for Harvard postdocs, since 2022