

# Mushegh Spartak Rafayelyan

## Research Institute of Physics

Ֆոտոնիկայի և արհեստական բանականության լաբորատորիա  
Head of laboratory

☎ 23-21

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## Education

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<b>Institution</b>	University of Bordeaux
<b>Faculty</b>	Laboratoire Ondes et Matière d'Aquitaine
<b>Date</b>	2013 - 2017
<b>Degree name</b>	PhD student

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<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Faculty of physics
<b>Date</b>	2012 - 2015
<b>Degree name</b>	PhD student

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<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Faculty of physics
<b>Date</b>	2010 - 2012
<b>Degree name</b>	Masters

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<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Faculty of physics
<b>Date</b>	2006 - 2010
<b>Degree name</b>	Bachelor

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## Scientific Rank/degree

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<b>Institution</b>	Laboratoire Ondes et Matière d'Aquitaine, University of Bordeaux
<b>Date</b>	2017
<b>Degree name</b>	Postgraduate
<b>Scientific Supervisor</b>	Etienne Brasselet
<b>Research Topic</b>	Singular Beam Shaping From Spin-Orbit Flat Optics

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<b>Institution</b>	Yerevan State University
<b>Date</b>	2015
<b>Degree name</b>	Candidate
<b>Specialty</b>	Physico-mathematical sciences
<b>Scientific Supervisor</b>	Ashot Gevorgyan
<b>Research Topic</b>	Optical properties of metamaterial-based cholesteric liquid crystals

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## Language skills

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Հայերեն English Français Русский

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## Work experience

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<b>Institution</b>	Yerevan State University
<b>Period of time</b>	2021 till now
<b>Rank/degree</b>	Head of laboratory

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## Publications

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*Article*

**Light-controllable liquid crystal platform for microparticle oscillations and transport**  
Sergey Shvetsov, Tetiana Orlova, Aleksandr Hayrapetyan, Alexey Vasil'ev, Mushegh Rafayelyan  
Soft Matter 2024 6920-6928

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*Article*

**Tunable spin-glass optical simulator based on multiple light scattering**  
Gianni Jacucci, Louis Delloye, Davide Pierangeli, Mushegh Rafayelyan, Claudio Conti, Sylvain Gigan  
Physical Review A 2022 033502

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*Article*

**Optical cloaking of macroscopic objects by geometric-phase vortex processing**  
Mushegh Rafayelyan, Henrik Melkonyan, Arman Tigranyan, Etienne Brasselet  
Journal of Optics 2022 094005

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*Article*

**Light localization in 1D chirped photonic crystals**  
A. H. Gevorgyan, N. A. Vanyushkin, M. S. Rafayelyan  
European Physical Journal Plus 2022 719/1-8

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*Article*

**Asymptotic Stability in Reservoir Computing**  
Mushegh Rafayelyan, Jonathan Dong, Erik Börve, Michael Unser  
IEEE Xplore 2022 01-08

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*Article*

**Особенности поглощения света в чирпированных одномерных фотонных кристаллах**  
А.А. Геворгян, Н.А. Ванюшкин, И.М. Ефимов, С.С. Голик, С.А. Мхитарян, М.З. Арутюнян,  
М.С. Рафаелян  
Оптика и спектроскопия (Optics and Spectroscopy) 2022 1583-1589

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*Article*

**Magnetically Induced Transparency in Media with Helical Dichroic Structure**  
Mushegh S. Rafayelyan, Gvidon K. Matinyan, Hermine Gharagulyan, Tatevik M. Sarukhanyan,  
Meruzhan Z. Hautyunyan, Ilya M. Efimov, Nikolay A. Vanyushkin, Sergey S. Golik, Ashot H. Gevorgyan

*Article*

**Scalable spin-glass optical simulator**

Mushegh Rafayelyan, Davide Pierangeli, Claudio Conti, Sylvain Gigan

PHYSICAL REVIEW APPLIED 2021 034087

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*Article*

**Multimode Robust Lasing in a Dye-Doped Polymer Layer Embedded in a Wedge-Shaped Cholesteric**

Tatevik M. Sarukhanyan, Hermine Gharagulyan, Mushegh S. Rafayelyan, Sergey S. Golik,

Ashot H. Gevorgyan, Roman B. Alaverdyan

Molecules 2021 6089

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*Article*

**Large-Scale Optical Reservoir Computing for Spatiotemporal Chaotic Systems Prediction**

Mushegh Rafayelyan, Jonathan Dong, Yongqi Tan, Florent Krzakala, Sylvain Gigan

Physical Review X 2020 041037

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*Article*

**Reservoir Computing meets Recurrent Kernels and Structured Transforms**

Mushegh Rafayelyan, Jonathan Dong, Ruben Ohana, Florent Krzakala

Advances in Neural Information Processing Systems 2020 16785-16796

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*Article*

**Optical Reservoir Computing Using Multiple Light Scattering for Chaotic Systems Prediction**

Jonathan Dong, Mushegh Rafayelyan, Florent Krzakala, Sylvain Gigan

IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS 2020 1-12

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*Article*

**Spin-to-orbital angular momentum mapping of polychromatic light**

Mushegh Rafayelyan, Etienne Brasselet

Physical Review Letters 2018 213903

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*Article*

**Laguerre-Gaussian quasi-modal q-plates from nanostructured glasses**

Mushegh Rafayelyan, Titas Gertus, Etienne Brasselet

Applied Physics Letters 2017 261108

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*Article*

**Laguerre-Gaussian modal q-plates**

Mushegh Rafayelyan, Etienne Brasselet

Optics Letters 2017 1966-1969

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*Article*

**Ultrabroadband gradient-pitch Bragg-Berry mirrors**

Mushegh Rafayelyan, Gonzague Agez, Etienne Brasselet

Physical Review A 2017 043862

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*Article*

**Spin-orbit optomechanics of optically levitated chiral Bragg microspheres**

Georgiy Tkachenko, Mushegh Rafayelyan, Etienne Brasselet

Physical Review A 2017 053839

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*Article*

**Reflective spin-orbit geometric phase from chiral anisotropic optical media**

Georgiy Tkachenko, Mushegh Rafayelyan, Etienne Brasselet

Physical Review Letters 2016 253902

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*Article*

**Bragg-Berry mirrors: reflective broadband q-plates**

Mushegh Rafayelyan, Etienne Brasselet

Optics Letters 2016 3972-3975

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*Conference*

**Nonlinear spatiotemporal dynamics of liquid crystals under the illumination of an inhomogeneous light field**

A. Mirzoyan, M. Rafayelyan, V. Grigoryan

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*Conference*

**Bragg-Berry cavities: orbital angular momentum manipulation of broadband light beams**

Sergey Shvetsov, Vahram Grigoryan, Valeri Abrahamyan, Nune Hakobyan, Hakob Margaryan,

Mushegh Rafayelyan

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*Conference*

**The role of the geometric phase in cholesteric with a defect layer toward multimodal robust lasing**

T.M. Sarukhanyan, M.S. Rafayelyan, H. Gharagulyan, R.B. Alaverdyan, S.S. Golik, A.H. Gevorgyan

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