

Dr Kristina Rusimova

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Research Experience

- 2021– **Lecturer**, *Department of Physics*, University of Bath.
- 2018–2021 **Prize Fellow**, *Department of Physics*, University of Bath.
- 2017–2018 **Research Associate**, *Centre for Photonics and Photonic Materials*, University of Bath.
- 2012–2016 **PhD Research Student**, *Centre for Nanoscience and Nanotechnology*, University of Bath.
- 2016 **Visiting PhD Student (6 months)**, *School of Physics and Astronomy*, University of Birmingham.

Education

- 2012–2016 **Doctor of Philosophy, Physics**, *University of Bath*.
- 2008–2012 **Master in Science, Physics with Nanotechnology**, *University of Birmingham*, *First Class with Honours (79%)*.

Awards

- Faraday Division Horizon Prize, Royal Society of Chemistry, 2022
- Acad. Emil Djakov Prize, Institute of Electronics, Bulgarian Academy of Sciences, 2019
- Eureka: Science in Bath First Place Poster Prize, University of Bath, 2018.
- Prize Fellowship, University of Bath, 2018
- Department of Physics Postgraduate Poster Afternoon First Place Poster Prize, University of Bath, 2016
- University Research Studentship (PhD Funding), University of Bath, 2012
- School of Physics and Astronomy Summer Studentships, University of Birmingham, 2010 & 2011
- School of Physics and Astronomy Award, University of Birmingham, 2009

Publications

- 17 *A self-consistent model to link surface electronic band structure to the voltage dependence of hot electron induced molecular nanoprobe experiments*, P. A. Sloan, and **K. R. Rusimova**, **Nanoscale Advances**, 4, 4880-4885 (2022).
- 16 *Modifying light-matter interactions with perovskite nanocrystals inside anti-resonant photonic crystal fiber*, A. Machnev, A. Pushkarev, P. Tonkaev, R. E. Noskov, **K. R. Rusimova**, P. J. Mosley, S. V. Makarov, P. B. Ginzburg, and I. I. Shishkin **Photonics Research**, 9(8), 1462-1469 (2021).
- 15 *Birefringent antiresonant hollow-core fibre*, S. Yerolatsitis, R. Shurvinton, P. Song, Y. Zhang, R. J. A. Francis-Jones, and **K. R. Rusimova**, **Journal of Lightwave Technology**, 38(18), 5157-5162 (2020). arXiv:1910.01906
- 14 *'Hot' in Plasmonics: Temperature-related Concepts and Applications of Metal Nanostructures*, C. Kuppe, **K. R. Rusimova**, L. Ohnoutek, D. Slavov, and V. K. Valev, **Advanced Optical Materials**, 8(1), 1901166 (2020)
- 13 *The nanometer limits of ballistic and diffusive hot-hole mediated nonlocal molecular manipulation*, H. G. Etheridge, **K. R. Rusimova**, and P. A. Sloan, **Nanotechnology**, 31(10), 105401 (2019)
- 12 *Passive, broadband and low-frequency suppression of laser amplitude noise to the shot-noise limit using hollow-core fibre*, E. J. Allen, G. Ferranti, **K. R. Rusimova**, J. A. Francis-Jones, M. Azini, D. Mahler, T. C. Ralph, P. J. Mosley, and J. Matthews, **Physical Review Applied**, 12, 044073, (2019) arXiv:1903.12598
- 11 *Common Source of Light Emission and Nonlocal Molecular Manipulation on the Si (111)-7×7 Surface*, R. M. Purkiss, H. G. Etheridge, P. A. Sloan, and **K. R. Rusimova**, **Journal of Physics Communications**, 3(9), 095010 (2019)
- 10 *Birefringent antiresonant hollow-core fibre*, S. Yerolatsitis, R. Shurvinton, P. Song, R. J. A. Francis-Jones, and **K. R. Rusimova**, *Proceedings of European Conference on Optical Communication*, Tu2E3 (2019)
- 9 *185 nm guidance in a hollow core antiresonant optical fibre*, B. Winter, D. Vorobiev, B. Fleming, E. Witt, W. Gilliam, **K. R. Rusimova**, S. Yerolatsitis, T. A. Birks, and W. J. Wadsworth, *Frontiers in Optics and Laser Science*, JTu3A.19 (2019)
- 8 *Atomic dispensers: thermoplasmonic control of alkali vapor pressure for quantum optical applications*, **K. R. Rusimova**, D. Slavov, F. Pradaux-Caggiano, J. T. Colling, S. N. Gordeev, D. R. Carbery, W. J. Wadsworth, P. J. Mosley, and V. K. Valev, **Nature Communications**, 10, 2328 (2019)
- 7 *First observation of hyper-Rayleigh scattering optical activity*, J. T. Collins, **K. R. Rusimova**, D. Hooper, L. Ohnoutek, H. H. Jeong, F. Pradaux-Caggiano, D. R. Carbery, T. Verbiest, P. Fischer, and V. K. Valev, **Physical Review X**, 9, 011024 (2019)
- 6 *Regulating the femtosecond excited-state lifetime of a single molecule*, **K. R. Rusimova**, R. M. Purkiss, R. Howes, F. Lee, S. Crampin, and P. A. Sloan, **Science**, 361 (6406), 1012-1016 (2018)
- 5 *Low-frequency suppression of classical laser fluctuations using a hollow-core fibre*, E. Allan, G. Ferranti, D. Mahler, **K. R. Rusimova**, P. J. Mosley, J. Matthews, *CLEO: Science and Innovations*, SF1K.7 (2018)
- 4 *Nonlocal manipulation with the scanning tunnelling microscope*, **K. R. Rusimova**, and P. A. Sloan, *Elsevier Encyclopedia of Interfacial Chemistry: Surface Science and Electrochemistry* (2017)
- 3 *Molecular and atomic manipulation mediated by electronic excitation of the underlying Si(111)-7×7 surface*, **K. R. Rusimova**, and P. A. Sloan, **Nanotechnology: Special Issue**, 28, 054002

(2017)

- 2 *Initiating and imaging the coherent surface dynamics of charge carriers in real space*, **K. R. Rusimova**, N. Bannister, P. Harrison, D. Lock, S. Crampin, R. E. Palmer, and P. A. Sloan, ***Nature Communications***, 7, 12839 (2016)
- 1 *Atomically resolved real-space imaging of hot electron dynamics*, D. Lock, **K. R. Rusimova**, T. L. Pan, R. E. Palmer, and P. A. Sloan, ***Nature Communications***, 6, 8365 (2015)

Patent

- V. K. Valev, D. Slavov, **K. R. Rusimova**, W. J. Wadsworth, and P. J. Mosley, "Nanoparticle coatings for alkali-metal vapour containers", IP2423.1GB, filed 13/11/2018, US Patent App. 17/293, 898

Research Income

- £317,495: P. J. Mosley, J. C. Knight & **K. R. Rusimova**, BT, 01/03/2022 - 31/08/2023
- £199,997: P. J. Mosley, & **K. R. Rusimova**, Hollow-core fibre cells for quantum memory, Innovate UK, 01/02/2022 - 31/07/2023
- £520,385: P. J. Mosley, T. Birks & **K. R. Rusimova**, Quantum Data Centre of the Future, Innovate UK, 01/03/2022 - 28/02/2025
- £106,605: V. K. Valev, & **K. R. Rusimova**, TRANSMUTING GOLD INTO AURIDES FOR ALKali Metal Magnetometry: ALKEMMY, EPSRC UK Quantum Technology Hub "Networked Quantum Information Technologies", 01/01/2021 - 30/06/2022

Conference Talks

Invited Talks

- 2022 **Hollow core fibres for alkali vapour spectroscopy**, *Second Joint Bath-TAU workshop*, Tel Aviv, Israel.
- 2021 **Thermal and non-thermal mechanisms of hot electron chemistry**, *Smart Nanomaterials 2021*, Paris, France.
- 2020 **Towards light-matter interactions on the atomic scale**, *Virtual AFM & SPM Meeting*, Royal Microscopy Society.
- 2019 **Hot electrons - a new source of light on the nanoscale**, *10th Vacuum Symposium UK*, Coventry, UK.
- 2019 **Hot electrons - a new source of light on the nanoscale**, *London Centre for Nanotechnology*, London, UK.
- 2019 **Hot electrons - a new source of light on the nanoscale**, *ISSC-22*, Swansea, UK.
- 2019 **Towards light-matter interactions on the atomic scale**, *Rank Prize Funds Symposium*, Grasmere, UK.
- 2018 **New origin of scanning tunnelling luminescence**, *Smart Nanomaterials 2018*, Paris, France.
- 2018 **Hot electron chemistry at a distance: nonlocal manipulation with the scanning tunneling microscope**, *5th International Conference on Materials Science and Nanotechnology for Next Generation*, Cappadocia, Turkey.

- 2018 **Design, properties, and characterisation of hollow core optical fibres**, 20th *International Conference and School on Quantum Electronics: Laser Physics and Applications*, Nessebar, Bulgaria.

Contributed Talks

- 2018 **Regulating the femtosecond excited-state lifetime of a single molecule**, 5th *International Conference on Materials Science and Nanotechnology for Next Generation*, Cappadocia, Turkey.
- 2018 **Atomic dispensers: thermoplasmonic control of alkali vapor pressure for quantum optical applications**, 11th *International Conference in Nanophotonics*, Wroclaw, Poland.
- 2015 **Real-space imaging of hot hole transport: toluene on the Si(111)-7×7 surface**, *Theory Meets Experiment: Molecular Nanoscience and Applications*, London, UK.

Poster Presentations

Seven poster presentations at: *Eureka: Science in Bath* (2018), *Bath-Bristol CDT in Condensed Matter Physics annual conference* (2016&2015), *Theory Meets Experiment: Molecular Nanoscience and Applications* (2015), *ISSC-20* (2015), *Celebration of Centenary of Frank-Hertz Experiment* (2014)

Supervision

Postdoctoral researchers

- Paramita Pal, 2023 –
- Cameron McGarry, 2022 –

PhD students

- Pieter Keenan, 2022 –
- Will Smith, 2021 –
- Dewan Chowdhury, 2018-2022

Project Supervision

- Thomas Coates-Evans and Shean Ong, 2022
- Louis Remington and Jamie Greenwood, 2021
- Danel Gomez Iradi, 2021
- Riley Shurvinton, 2018

Public Engagement, Outreach, Seminars and Industrial Links

Outreach in Schools

'Look into My Eyes': Leading workshops for award winning outreach to year 6 in schools across Bath and Wiltshire (2017 & 2018); Demonstrator during A-level school visit to the University of Bath (2015 & 2016); School visit and presentation at a secondary school in Bulgaria (2016); Volunteer at Bath Taps into Science (2013); IOP STEM school visit to Ralph Allen School (2012).

Seminars

Department of Physics postgraduate poster session (University of Bath, 2016); Faculty of Science Research Afternoon: presentation, poster and lightning talk (University of Bath, 2014 and 2015); CantaBulgaria Conference Presentation (Bulgarian Embassy, London, 2015).

Public Engagement

STEM for Britain finals, House of Commons, London (2017).

Additional Training and Committee Engagement

Eureka 2022 Conference organiser, Early career lunch organiser (2021-), Department self-assessment team (DSAT) member (2017-2019); Bath Academic Career Academy (2017), Reviewer for PCCP, JPC, Optics Express, Nature Commun.

Industrial Links

- Renishaw plc., Wotton-under-Edge, UK
I provided consultancy on the use of lock-in techniques for the detection of weak optical signals.
- TMD Technologies Ltd., Hayes, UK
Project partners on Innovate UK project. Hollow-core fibre filling with Rb.
- Chronos Technology Ltd., Ross-on-Wye, UK
Project partners on Innovate UK project. Electronic circuit design.
- British Telecoms, London, UK
Project partners.