Dr Maria Zamyatina CV

Contact

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Academic career

Postdoctoral Research Fellow Apr 2022-now
Department of Physics and Astronomy, University of Exeter | Exeter, UK
- Adapting LFRic to model atmospheres of hot Jupiters

Postdoctoral Research Fellow Sep 2019-Mar 2022
Department of Physics and Astronomy, University of Exeter | Exeter, UK
- Modelling hot Jupiter atmospheric chemistry with the Met Office Unified Model

Education

PhD in Environmental Sciences 2015-2020
School of Environmental Sciences, University of East Anglia | Norwich, UK
Supervisors: Prof. Claire Reeves, Dr Paul Griffiths, Dr Marcus Köhler, Dr Mike Newland
Thesis: Impacts of C_1-C_3 alkyl nitrates on tropospheric ozone chemistry

MSc in Climate Change with Distinction 2014-2015
School of Environmental Sciences, University of East Anglia | Norwich, UK
Supervisor: Prof. Claire Reeves
Thesis: Investigation of the relationship between tropospheric ozone production efficiency and carbon bond emissions

Specialist Diploma in Meteorology 2009-2014
Faculty of Geography, Lomonosov Moscow State University | Moscow, Russia
Supervisor: Prof. Alexander V. Kislov
Thesis: Climatically-induced variations of the Caspian Sea level over the last Millennium

Publications

9. Espinoza, N., Steinrueck, M., Kirk, J., MacDonald, R. J. et al. (incl. **Zamyatina, M.**) (under second review). Detection of inhomogeneous terminators on the exoplanet WASP-39 b. Nature.
8. **Zamyatina, M.**, Christie, D. A., Hébrard, E., Mayne, N. J., Radica, M. et al. (2024). Quenching-driven equatorial depletion and limb asymmetries in hot Jupiter atmospheres: WASP-96b example. MNRAS.
7. Taylor, J., Radica, M., Welbanks, L., MacDonald, R. J. et al. (incl. **Zamyatina, M.**) (2023). Awesome SOSS: atmospheric characterisation of WASP-96b using the JWST early release observations. MNRAS.
6. Radica, M., Welbanks, L., Espinoza, N., Taylor, J. et al. (incl. **Zamyatina, M.**) (2023). Awesome SOSS: transmission spectroscopy of WASP-96b with NIRISS/SOSS. MNRAS.
5. **Zamyatina, M.**, Hébrard, E., Drummond, B., Mayne, N. J., Manners, J. et al. (2023). Observability of signatures of transport-induced chemistry in clear atmospheres of hot gas giant exoplanets. MNRAS.
4. Ridgway, R. J., **Zamyatina, M.**, Mayne, N. J., Manners, J., Lambert, F. H. et al. (2023). 3D modelling of the impact of stellar activity on tidally locked terrestrial exoplanets: atmospheric composition and habitability. MNRAS.
3. Christie, D. A., Lee, E. K. H., Innes, H., Noti, P. A. et al. (incl. **Zamyatina, M.**) (2022). CAMEMBERT: A Mini-Neptunes GCM Intercomparison, Protocol Version 1.0. A CUISINES Model Intercomparison Project. Planet. Sci. J.
2. Braam, M., Palmer, P. I., Decin, L., Ridgway, R. J., **Zamyatina, M.** et al. (2022). Lightning-induced chemistry on tidally-locked Earth-like exoplanets. MNRAS.
1. Gromov, S.A., Gromov, S.S., **Zamyatina, M.**, Trifonova-Yakovleva, A. M. (2013). First-order evaluation of transboundary pollution fluxes in areas of EANET stations in Eastern Siberia and the Russian Far East. EANET Science Bulletin, 3:195-203.

Invited talks

Mar 2024 Overview of the Met Office Unified Model configuration for hot Jupiter atmospheres
International Space Science Institute (ISSI) workshop | Bern, Switzerland

Feb 2024 Quenching-driven equatorial depletion and limb asymmetries in WASP-96b's atmosphere
University of Bristol (astronomy seminar) | Bristol, UK

Feb 2023 Atmospheric dynamics and chemistry on exoplanets
University of Queensland (astronomy seminar) | Brisbane, Australia
University of Southern Queensland (exoplanet seminar) | Brisbane, Australia
University of New South Wales (astronomy seminar) | Sydney, Australia

Nov 2022 Observability of signatures of wind-driven chemistry in atmospheres of hot gas giants
Ludwig Maximilian University (exoplanet group seminar) | Munich, Germany
Celebrating JWST's first six months of exoplanet data workshop | Ringberg castle, Germany

Oct 2022 Modelling chemistry of hot Jupiter atmospheres with the Met Office Unified Model
Met Office | Exeter, UK

Feb 2022 Transport-induced quenching shapes transmission spectra of warm and hot Jupiters
University of Warwick (astronomy seminar) | virtual

Contributed talks

Sep 2023 Metallicity masquerade: how to use quenching to distinguish between different planet metallicities
University of Bristol (BOWIE meeting) | Bristol, UK

June 2021 Overview of the Met Office Unified Model adapted to simulate exoplanetary atmospheres
Ariel consortium meeting | virtual

Apr, Sep 2021 3D simulations of warm and hot Jupiter atmospheres: the role of 3D mixing in shaping CH_4-to-CO conversion pathways
EPSC conference | virtual
UKEXOM conference | virtual
University of Exeter (astronomy seminar) | Exeter, UK

Mar, Apr, Jun 2019 Impact of C_1-C_3 alkyl nitrate chemistry on tropospheric ozone: box and global model perspectives
University of Exeter (XCS seminar) | Exeter, UK
EGU conference | Vienna, Austria
University of East Anglia (AMB seminar) | Norwich, UK

Apr 2017 Adding new chemistry into UM-UKCA
Cambridge-EnvEast doctoral alliance symposium | Cambridge, UK

Sep 2012 Assessment of climatological potential of transboundary air pollution transport in Eastern Siberia and the Russian Far East
Air quality management at urban, regional and global scales 4th international symposium/IUAPPA regional conference | Istanbul, Turkey

Posters

Apr, Jun 2024 Quenching-driven equatorial depletion and limb asymmetries in WASP-96b's atmosphere
UKEXOM conference | Birmingham, UK
Exoplanets 5 conference | Leiden, Netherlands

Sep 2022 Applying known chemical kinetics data to model atmospheres of extrasolar planets
iCACGP-IGAC conference | Manchester, UK

Sep 2021 Local and global impacts of C_1-C_3 alkyl nitrate photochemistry and emissions on tropospheric ozone
IGAC conference | virtual

Sep 2018 Impact of alkyl nitrate chemistry on tropospheric ozone
iCACGP-IGAC conference | Takamatsu, Japan

Mar, Apr 2018 Impact of C_1-C_5 alkyl nitrate chemistry on tropospheric ozone - a box modelling study
Cambridge-EnvEast doctoral alliance symposium | Cambridge, UK
EGU conference | Vienna, Austria

Awards

2023	Above & Beyond Award	
2022	**EPSRC vacation internship** (for 3 interns)	12893.55£
2022	**Jackson-Grime-Davies (JGD) research internship** (for 1 intern)	2428.71£
2021	**IGAC Early Career Scientist poster prize & travel grant**	1227.70£
2015-2019	**Lord Zuckerman studentship**	112269.50£
2014-2015	**Simon Wharmby postgraduate scholarship**	3000.00£
2012	**World Meteorological Organization travel grant**	1154.10£

Awarded observing time

Feb 2024 Co-I JWST GO-5844 (PI: Michael Radica) — 16.40 hours
- Starspots, hazes, and disequilibrium chemistry: a deep dive into the atmosphere of HAT-P-18b

Feb 2024 Co-I JWST GO-5924 (PI: David Sing) — 125.70 hours
- JWST's exoplanet grand tour spectroscopic survey

May 2023 Co-I JWST GO-3154 (PI: Eva-Maria Ahrer) — 10.36 hours
- Testing the C/O ratio prediction for hot Jupiters from disk-free migration

May 2023 Co-I JWST GO-3838 (PI: James Kirk Co-PI: Eva-Maria Ahrer) — 49.21 hours
- Does atmospheric composition actually trace formation? Observing aligned vs misaligned hot Jupiters as a testbed

May 2023 Co-I JWST GO-3969 (PI: Nestor Espinoza, Co-PI: Diana Powell) — 61.53 hours
- Hot Jupiter atmospheric forecast: Are mornings cloudier than evenings in other worlds?

May 2023 Co-I JWST GO-4082 (PI: Michael Radica, Co-PI: Jake Taylor) — 6.69 hours
- Putting it all together: Dynamics and chemistry probed through transmission spectroscopy of a cloud-free exoplanet

Supervision

Primary supervisor and co-supervisor. Students who went on to do a PhD are marked with *.

PhD supervision (1)

Nov 2020-May 2023 Robert J. Ridgway
Thesis: Simulating the impact of stellar flares on the climate and habitability of terrestrial Earth–like exoplanets
Co-supervisors: Prof. N. J. Mayne, Prof. F. H. Lambert, Dr. J. Manners

Undergraduate and summer internship supervision (4)

Jun-Aug 2022 EPSRC-funded: Harry Baskett*, Ben Moore*, James McDermott*; JGD-funded: Graig Lils
Project: 3D modelling of hot Saturn atmospheric chemistry

Teaching

Jul 2023 **Module leader**
Module: No place like home: placing Earth in its geological and astronomical contexts
International sustainability summer school | University of Exeter, Exeter, UK

Jul 2022, Jul 2023 **Lecturer**
Module: No place like home: placing Earth in its geological and astronomical contexts
International sustainability summer school | University of Exeter, Exeter, UK

Sep 2021-Feb 2022 **Associate Tutor**
Modules: Experimental science, Frontiers in science
University of Exeter | Exeter, UK

Jan 2018 **Instructor**
Module: Introduction to Python in Environmental Sciences
University of East Anglia | Norwich, UK

2015-2018 **Associate Tutor**
Modules: Numerical skills for scientists, Atmospheric chemistry and global change, Atmospheric composition (measurements and modelling), Atmosphere & oceans I
University of East Anglia | Norwich, UK

Vocational training

Sep 2023 Belbin training
Mar 2023 Leadership training
Dec 2022 Interview training
Mar 2020 JWST proposal planning workshop
Apr 2016 NAME workshop
Jan 2016 Introduction to UKCA
Dec 2015 Introduction to Unified Model
Nov 2015 Introduction to Atmospheric Science
2015-2019 EnvEast Doctoral Training Programme

Academic community

Organisation of scientific meetings

26-30 Jun 2023 Exoclimes VI conference (LOC member) ~200 attendees
University of Exeter | Exeter, UK

22-24 Jun 2023 ExoSLAM school (LOC member) ~50 attendees
University of Exeter | Exeter, UK

5-6 Dec 2022 BOWIE meeting [JWST proposal brainstorming] (co-organiser) 17 attendees
University of Exeter | Exeter, UK

Sep 2017-Jun 2018 Atmospheric and Marine Biogeochemistry (AMB) seminars (co-organiser) ~20 attendees
University of East Anglia | Norwich, UK

Reviewing

Journals: The Astrophysical Journal, Monthly Notices of the Royal Astronomical Society
Proposals: external expert reviewer for JWST Cycle 3

Outreach

Sep 2023 Expert scientist at the Climate Exhibition (part of the British Science Festival)
Nov 2015-Jun 2019 Maintainer of @AtmosChemUEA Twitter account