

Ryan Vella

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Research interest

Earth System Modelling, climate change, aerosol-cloud interactions, aerosol-climate interactions, cloud physics, atmosphere-ocean interactions, climate variability, convection, large-scale circulation, model development.

Experience

ETH Zurich

Postdoctoral scientist, cloud physics

Zurich, Switzerland

Apr 2025 – present

Max Planck Institute for Chemistry

Postdoctoral scientist, climate modelling

Mainz, Germany

Aug 2024 – Mar 2025

MST Audiovisual Ltd.

Satellite data engineer

Remote (Malta)

May 2023 – Aug 2024

European Space Agency

National Trainee

Frascati, Italy

Nov 2019 – Oct 2020

Transport Malta

GIS Specialist

Lija, Malta

May 2016 – Oct 2019

Education

Max Planck Institute for Chemistry & Institute for Atmospheric Physics Mainz, Germany

PhD (Dr. rer. nat.)

Nov 2020 – Jul 2024

Thesis: *Bi-directional feedbacks of interactive vegetation dynamics and the atmospheric aerosol burden in the Earth system*, advised by Prof. Jos Lelieveld & Prof. Holger Tost

University of Malta

MSc Geosciences

Malta

Sep 2018 – Sep 2019

Thesis: *A study on the dynamics of particulate matter infiltration in buildings*, advised by Prof. Noel J. Aquilina

University of Malta

BSc(Hons.) Physics & Mathematics

Malta

Sep 2014 – Jul 2018

Thesis: *Assessing the night-sky brightness of the Maltese Islands*, advised by Prof. Joseph Caruana.

Internship at the Institute of Quantum Optics and Quantum Information (Vienna), 2016

G.F Abela Junior College

Matriculation Certificate

Malta

Oct 2012 – Sep 2014

Advanced Level: Pure Mathematics, Physics

Intermediate Level: Chemistry, English, Philosophy, Systems of Knowledge

Academic honours and funding

Admission to the Max Planck Graduate Center (PhD)

Funding for PhD proposal, University of Mainz & Max Planck Society 2021

European Space Agency Fellowship

The Malta Council for Science and Technology (MCST) 2019

ENDEAVOUR Scholarship Scheme (MSc)

Ministry of Education, Government of Malta 2019

Best Final Year Project in Numerate Sciences award (BSc Dissertation)

University of Malta, Faculty of Science (sponsored by MCA) 2019

Certificate of merit (BSc dissertation)

University of Malta, Faculty of Science 2019

Publications

2025.....

- *Insights into climate variability of the meteorological records from a background monitoring station: The Giordan Lighthouse, Gozo*
Ciarlo, J. M., **Vella, R.**, Saliba, M., Ellul, R., Micallef, A., Coppola, E., Micallef, A., Mifsud, D
Open Research Europe, in review. [Full]
- *Shifts in global atmospheric oxidant chemistry from land cover change*
Vella, R., Gromov, S., Nussbaumer, C. M., Stecher, L., Kohl, M., Ruhl, S., Tost, H., Lelieveld, J., Pozzer, A.
Atmospheric Chemistry and Physics, accepted. [Full]
- *Impacts of convection, chemistry, and clearing on biogenic volatile organic compounds over the Amazon*
Tripathi, N., Edtbauer, A., Ringsdorf, A., Wang, N., Krumm, B., Kohl, M., **Vella, R.**, Pozzer, A., Lelieveld, J., Williams, J.
Nature Communications. [Full]
- *Influence of land cover change on atmospheric organic gases, aerosols, and radiative effects*
Vella, R., Forrest, M., Pozzer, A., Tsimpidi, A. P., Hickler, T., Lelieveld, J., Tost, H.
Atmospheric Chemistry and Physics. [Full]

2024.....

- *Bi-directional feedbacks of interactive vegetation dynamics and the atmospheric aerosol burden in the Earth system*
Vella, R., PhD thesis. [Full]

2023.....

- *Changes in biogenic volatile organic compound emissions in response to the El Niño–Southern Oscillation*
Vella, R., Pozzer, A., Forrest, M., Lelieveld, J., Hickler, T., Tost, H.
Biogeosciences, 20(20), 4391–4412. [Full]

- *Isoprene and monoterpene simulations using the chemistry–climate model EMAC (v2.55) with interactive vegetation from LPJ-GUESS (v4.0)*
Vella, R., Forrest, M., Lelieveld, J., Tost, H.
Geoscientific Model Development, 16(3), 885–906. [Full]

2021.....

- *COVID-19-related changes in NO₂ and O₃ concentrations and associated health effects in Malta*
Fenech, S., Aquilina, N. J., **Vella, R.**
Frontiers in Sustainable Cities, 3, 631280. [Full]

2020.....

- *A photometric mapping of the night sky brightness of the Maltese islands*
Caruana, J., **Vella, R.**, Spiteri, D., Nolle, M., Fenech, S., Aquilina, N. J.
Journal of Environmental Management, 261, 110196. [Full]

Conferences

2025.....

- **74th Lindau Nobel Laureate Meeting**, Lindau, Germany
33 Laureates and 600 top young scientists. Representing the University of Malta

2024.....

- **AGU Fall Meeting**, Washington, D.C., USA — *Talk*
The impact of land cover change on tropospheric chemistry and aerosols
- **EGU General Assembly**, Vienna, Austria — *Poster*
Changes in BVOCs and atmospheric aerosol from human deforestation

2023.....

- **AGU Fall Meeting**, San Francisco, USA — *Poster*
Biogenic aerosols with interactive BVOC precursors in the chemistry–climate model EMAC
- **EGU General Assembly**, Vienna, Austria — *Talk*
Isoprene and monoterpene emission response to the El Niño–Southern Oscillation

2022.....

- **IGAC Conference**, Manchester, UK — *Poster*
Using a coupled chemistry–climate–vegetation modelling system to evaluate BVOC emission changes in the Earth System
- **EGU General Assembly**, Vienna, Austria — *Talk*
Incorporating vegetation dynamics for terrestrial isoprene and monoterpene emission estimates: Linking LPJ-GUESS (v4.0) with the EMAC modelling system (v2.54)

Mentorships, teaching and professional service

MAINZmentoring Programme

Mentored by Dr Mark Parrington at ECMWF in Bonn, Germany (2024)

Max Planck Institute for Chemistry, Mainz, Germany

PhD Students Lecture Series 2023 (organiser), delivered a lecture on *Atmospheric Radiative Transfer*

Reviewer for the journals *Biogeosciences*, *Nature Geoscience*, and *Atmospheric Chemistry & Physics*

Computational skills

Dynamical Models: Experienced in the development and application of the ICON model on the SANTIS supercomputer at the Swiss National Supercomputing Centre (CSCS), as well as the ECHAM/MESSy Atmospheric Chemistry (EMAC) global model, with extensive development and simulation work on MOGON II (University of Mainz) and LEVANTE (DKRZ).

Programming and technical software: Python, R, Matlab, Fortran, C++, bash, Ferret, CDO

Other: GIS software, LaTeX

Social engagement and outreach

Panel discussion for World Meteorological Day (invited)

A discussion titled

'Decoding the Weather: The Science and Challenges of Weather Forecasting'

organised by The Malta Chamber of Scientists

Mar 2025

Faculty of Science Seminar Series, University of Malta (invited)

Talk: "Vegetation-Chemistry-Climate Interaction: The Role of Natural Emissions in Shaping the Climate System"

Mar 2025

Featured in a national news segment discussing convective rain patterns in Malta

Guest Appearance on TVMnews

Aug 2024

PhD Student Representative

Max Planck Institute for Chemistry

Sep 2022 – Aug 2023

Public talk on light pollution in Malta

Invited by The Astronomical Society of Malta

Jun 2019

Science in the City

Science outreach activity in Malta

Sep 2016 & Sep 2019

Languages

Maltese & English: Both first languages

Italian: Fluent in reading, writing and speaking

German: Fair

Free-time activities

Photography, environmental activism, trekking, electronics, astronomy, biking