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 — Zurich, Switzerland
Postdoctoral Scientist, Cloud Physics — April 2025 - Present

Max Planck Institute for Chemistry — Mainz, Germany
Postdoctoral Scientist, Climate Modelling — August 2024 - March 2025

MST Audiovisual Ltd. — Remote (Malta)
Satellite Data Engineer — May 2023 - August 2024

European Space Agency — Frascati, Italy
National Trainee, satellite remote sensing — November 2019 - October 2020

Transport Malta — Lija, Malta
GIS Specialist — May 2016 - October 2019

Education

Max Planck Institute for Chemistry & Institute for Atmospheric Physics — Mainz, Germany
PhD (Dr. rer. nat.) — November 2020 - July 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 — Malta
MSc Geosciences — September 2018 - September 2019

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

University of Malta — Malta
BSc(Hons.) Physics & Mathematics — September 2014 - July 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 — Malta
Matriculation Certificate — October 2012 - September 2014

- Advanced Level: Pure Mathematics, Physics.
- Intermediate Level: Chemistry, English, Philosophy, Systems of Knowledge.

Academic Honours and Funding

- **2021**: Funding for PhD proposal, University of Mainz & Max Planck Society (Admission to the Max Planck Graduate Center).
- **2019**: 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.

Publications

2025

- Ciarlo, J. M., **Vella, R.**, Saliba, M., Ellul, R., Micallef, A., Coppola, E., Micallef, A., Mifsud, D. (2025). *Insights into climate variability of the meteorological records from a background monitoring station: The Giordan Lighthouse, Gozo*. *Open Research Europe*, in review. [Full]
- **Vella, R.**, Gromov, S., Nussbaumer, C. M., Stecher, L., Kohl, M., Ruhl, S., Tost, H., Lelieveld, J., Pozzer, A. (2025). *Shifts in global atmospheric oxidant chemistry from land cover change*. *Atmospheric Chemistry and Physics*, accepted. [Full]
- Tripathi, N., Edtbauer, A., Ringsdorf, A., Wang, N., Krumm, B., Kohl, M., **Vella, R.**, Pozzer, A., Lelieveld, J., Williams, J. (2025). *Impacts of convection, chemistry, and clearing on biogenic volatile organic compounds over the Amazon*. *Nature Communications*. [Full]
- **Vella, R.**, Forrest, M., Pozzer, A., Tsimpidi, A. P., Hickler, T., Lelieveld, J., Tost, H. (2025). *Influence of land cover change on atmospheric organic gases, aerosols, and radiative effects*. *Atmospheric Chemistry and Physics*. [Full]

2024

- **Vella, R.** (2024). *Bi-directional feedbacks of interactive vegetation dynamics and the atmospheric aerosol burden in the Earth system*. PhD thesis. [Full]

2023

- **Vella, R.**, Pozzer, A., Forrest, M., Lelieveld, J., Hickler, T., Tost, H. (2023). *Changes in biogenic volatile organic compound emissions in response to the El Niño–Southern Oscillation*. *Biogeosciences*, 20(20), 4391–4412. [Full]
- **Vella, R.**, Forrest, M., Lelieveld, J., Tost, H. (2023). *Isoprene and monoterpene simulations using the chemistry–climate model EMAC (v2.55) with interactive vegetation from LPJ-GUESS (v4.0)*. *Geoscientific Model Development*, 16(3), 885–906. [Full]

2021

- Fenech, S., Aquilina, N. J., **Vella, R.** (2021). *COVID-19-related changes in NO_2 and O_3 concentrations and associated health effects in Malta*. *Frontiers in Sustainable Cities*, 3, 631280. [Full]

2020

- Caruana, J., **Vella, R.**, Spiteri, D., Nolle, M., Fenech, S., Aquilina, N. J. (2020). *A photometric mapping of the night sky brightness of the Maltese islands*. *Journal of Environmental Management*, 261, 110196. [Full]

Conferences

2025

- **74th Lindau Nobel Laureate Meeting**, Lindau, Germany: Represented 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)."

Mentorship, Teaching, and Professional Service

Mentorship: Mentored by Dr. Mark Parrington at ECMWF in Bonn, Germany (2024), part of the **MAINZmentoring Programme**.

Teaching: Max Planck Institute for Chemistry, Mainz, Germany — Organised PhD Students Lecture Series 2023 and delivered a lecture on *Atmospheric Radiative Transfer*.

Reviewer: For *Biogeosciences*, *Nature Geoscience*, and *Atmospheric Chemistry & Physics*.

Computational Skills

Dynamical Models: Experienced in developing and applying the ICON model on SANTIS (CSCS), and EMAC global model, with work on MOGON II (Mainz) and LEVANTE (DKRZ).

Programming and Technical Software: Python, R, Matlab, Fortran, C++, bash, Ferret, CDO.

Other: GIS software, LaTeX.

Social Engagement and Outreach

March 2025: Panel discussion "Decoding the Weather: The Science and Challenges of Weather Forecasting" for World Meteorological Day (invited by The Malta Chamber of Scientists).

March 2025: Talk "Vegetation-Chemistry-Climate Interaction: The Role of Natural Emissions in Shaping the Climate System" for the Faculty of Science Seminar Series, University of Malta (invited).

August 2024: Guest Appearance on TVMnews, featured in a national news segment discussing convective rain patterns in Malta.

September 2022 – August 2023: PhD Student Representative at Max Planck Institute for Chemistry.

June 2019: Public Talk on light pollution in Malta, invited by The Astronomical Society of Malta.

September 2016 & September 2019: Science in the City, science outreach activity in Malta.

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.

Last updated 15.07.2025