

RYAN VELLA

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RESEARCH INTEREST

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

EXPERIENCE

ETH Zurich Postdoctoral Scientist, Cloud Physics	Zurich, Switzerland April 2025 - Present
National Center for Atmospheric Research (NCAR) Visiting Postdoctoral Scientist	Boulder, CO, USA June 2026 - July 2026
Max Planck Institute for Chemistry Postdoctoral Scientist, Climate Modelling	Mainz, Germany August 2024 - March 2025
MST Audiovisual Ltd. Satellite Data Engineer	Remote (Malta) May 2023 - August 2024
European Space Agency National Trainee, satellite remote sensing	Frascati, Italy November 2019 - October 2020
Transport Malta GIS Specialist	Lija, Malta May 2016 - October 2019

EDUCATION

Max Planck Institute for Chemistry & Institute for Atmospheric Physics PhD (Dr. rer. nat.) Thesis: <i>Bi-directional feedbacks of interactive vegetation dynamics and the atmospheric aerosol burden in the Earth system</i>, advised by Prof. Jos Lelieveld & Prof. Holger Tost.	Mainz, Germany November 2020 - July 2024
University of Malta MSc Geosciences Thesis: <i>A study on the dynamics of particulate matter infiltration in buildings</i>, advised by Prof. Noel J. Aquilina.	Malta September 2018 - September 2019
University of Malta BSc(Hons.) Physics & Mathematics - Thesis: <i>Assessing the night-sky brightness of the Maltese Islands</i>, advised by Prof. Joseph Caruana. - Internship at the Institute of Quantum Optics and Quantum Information (Vienna), 2016.	Malta September 2014 - July 2018
G.F Abela Junior College Matriculation Certificate - Advanced Level: Pure Mathematics, Physics. - Intermediate Level: Chemistry, English, Philosophy, Systems of Knowledge.	Malta October 2012 - September 2014

ACADEMIC HONOURS AND FUNDING

- 2025: 30th Anniversary Junior College Awards (Uni Malta), Alumnus Award for *significant contribution to society, contribution to science and environment*.
- 2025: 74th Lindau Nobel Laureate Meeting, Lindau, Germany: Represented the University of Malta.
- 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.

2026

- Ciarlo, J. M., **Vella, R.**, Cauchi, J. P., Camilleri, S., Micallef, A., Coppola, E., Micallef, A., Mifsud, D. (2026). *A multi-station climatology of the Maltese Islands: coastal, topographic, and urban drivers of intra-island variability*. *Atmospheric Research* (in review).
- **Vella, R.**, Lohmann, U. (2026). *Aerosol–cloud interactions influence the climate response to AMOC weakening*. *Atmospheric Chemistry and Physics* (in review). [Preprint]
- Kohl, M., Brühl, C., Tost, H., Xenofontos, C., Christoudias, T., Gromov, S., Appel, O., Borrmann, S., Bourassa, A., Campuzano-Jost, P., Cheng, Y., Eppers, O., Froyd, K. D., Holanda, B. A., Jimenez, J. L., Jöckel, P., Joppe, P., Kaiser, K., Katich, J. M., Klingmüller, K., Köllner, F., Kupc, A., Martin, A., Pöhlker, C., Pöhlker, M. L., Pöschl, U., Rieger, L., Ruhl, S., Schill, G. P., Schneider, J., Schulz, C., Schwarz, J. P., Tsimpidi, A. P., **Vella, R.**, Williamson, C. J., Yang, Y., Zawada, D., Lelieveld, J., Pozzer, A. (2026). *Global atmospheric aerosol distributions and composition from the Earth's surface to the stratosphere*. *Atmospheric Chemistry and Physics* (in review). [Preprint]
- Visioni, D., Robock, A., Duffey, A., Henry, M., Hirasawa, H., Lee, W. R., Wang, C., Roberts, K., Watanabe, S., Reboita, M. S., Sugiyama, M., Kravitz, B., Haywood, J., Tilmes, S., Bonou, F., Chen, J., Sukodolov, T., Vattioni, S., Jörimann, A., Villanueva, D., **Vella, R.**, Farron, P., Bednarz, E. M., Niemeier, U., Golja, C., Anel, J. A. (2026). *The Geoengineering Model Intercomparison Project (GeoMIP) contribution to CMIP7 – description of new experimental protocols and preliminary results*. *Geoscientific Model Development* (in review). [Preprint]
- Ruhl, S., Kohl, M., Baalbaki, R., Xenofontos, C., **Vella, R.**, Gromov, S., He, X.-C., Shen, J., Alfaouri, D., Atabakhsh, S., Dada, L., DeVivo, J., Duplissy, J., El Haddad, I., Harder, H., Jokinen, T., Junninen, H., Kanawade, V. P., Sebastian, M. K., Klebach, H., Kulmala, M., Kunkler, F., Lelieveld, J., Lehtipalo, K., Lietzke, C. J., Liu, L., Mauldin, R., Mentler, B., Möhler, O., Petäjä, T., Russell, D. M., Simon, M., Thakur, R. C., Yu, W., Zhang, J., Zheng, Z., Kirkby, J., Tost, H., Christoudias, T., Sander, R., Pozzer, A. (2026). *Oxidation mechanisms for volatile methylated sulfur compounds and the major contribution of methanesulfonic acid to Southern Ocean aerosol particles*. *Atmospheric Chemistry and Physics* (in review). [Preprint]
- **Vella, R.**, Steil, B., Meccia, V., Tost, H., Lelieveld, J., Pozzer, A. (2026). *Air Quality Penalty in Southeast Asia Driven by AMOC Slowdown*. *Geophysical Research Letters*, 53(8). [Full]
- **Vella, R.**, Ferrachat, S., Lohmann, U., Villanueva, D. *Mixed-phase cloud response to dust INP perturbations strongly depends on ice nucleation scheme choice*. Manuscript submitted.

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*. [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*. [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 NO₂ and O₃ 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

2026

- **Climate Engineering Gordon Research Conference**, Newry, ME, USA — *Poster*: "Evaluating mixed-phase cloud thinning potential in climate models"
- **EGU General Assembly**, Vienna, Austria — *Talk*: "Sensitivity of mixed-phase cloud properties to ice-nucleating particles and model resolution"

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, SUPERVISION, AND PROFESSIONAL SERVICE

Supervision:

- MSc project (2026), Valentin Schmitz — *Assessing Convection Sensitivities in ICON Large-Eddy Simulations over Malta*.
- BSc project (2026), Nathalie Keller — *Characterising Convective Storms in the Mediterranean Sea in Current and Future Climates*.
- Semester project in Physics (2025), Valentin Schmitz — *A Multi-Event ICON-LES Study of Convective Development Over Malta*.

Member of *The Weather Discussion Steering Group* at ETH Zurich, organising weekly weather meetings (2025/2026).

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*, *Atmospheric Chemistry & Physics*, *Nature Communications Sustainability*, *Nature*.

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

August 2026: Scientifica, Zurich — science outreach stand.

January 2026: Guest Appearance on TVMnews, discussing Strom Harry.

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 September 8, 2026