

ACADEMIC EDUCATION

2020 - Applied Physics – Meteorology, PhD. Cum Laude, UB (Spain)

Thesis: Radar-based nowcasting of severe thunderstorms: A better understanding of the dynamical influence of complex topography and the sea

2015 - Meteorology, M.S., UB (Spain)

Thesis: Identification of anomalous motion of thunderstorms using radar and satellite data

2014 - Physics, B.S., UB (Spain)

AWARDS RECEIVED

2020 - Early Career Scientists Assembly (ECSA) Steering Committee Travel Award, NSF NCAR

2019 - Advanced Study Program-Graduate Visitor Program, NSF NCAR

2018 - ERAD Travel Support, 10th European Conference on Radar in Meteorology and Hydrology

2017 - Young Scientist Travel Award (YSTA), EMS

2016 - EGU Support Award for Early Career Scientist, EGU Secretary Office, and 15th Plinius Scientific Committee

2016 and 2017 - Travel Award, UB

INVITED TALKS AND TRAINING

2023 - CREWS/SWFP (WMO) - Eastern Africa- Training Workshop on Severe Weather and Impact-based Forecast and Warning Services (invited lecturer by WMO) 13-23 June 2023, Kigali, Rwanda.

2023 - Training on TITAN and storm analysis (invited by Advanced Radar Company) MeteoRwanda (online)

2022 - Radar and Severe Weather Nowcasting (invited talk within FINKERAT-FMI project) MeteoRwanda (online)

2020, 2021 - ESSL Testbed, Expert Week (invited), European Severe Storm Laboratory

2018 – Keynote presentation: Performance of a new algorithm for nowcasting anomalous trajectories, 10th European Conference on Radar in Meteorology and Hydrology (ERAD), Ede (The Netherlands)

AWARDED PROPOSALS AND PROJECTS

2023 - NCAR President's Strategic Initiative Fund (PSIF) research award- Accelerating environmental sustainability solutions in Africa: a UCAR initiative National Center for Atmospheric Research

2021 - Advanced Study Program-Postdoctoral Fellow Program, National Center for Atmospheric Research

2021 - Scientific Research Award to Urban Challenges in the City of Barcelona 2020, Barcelona Townhall (Not performed due to incompatibility)

PROFESSIONAL EXPERIENCE/ APPOINTMENTS

05/2024 - Project Scientist I, Earth Observing Laboratory (EOL), NSF National Center for Atmospheric Research, NCAR (Boulder, CO, USA)

10/2021 - 04/2024 - Advance Study Program- Postdoctoral Fellow, NSF National Center for Atmospheric Research, NCAR (Boulder, CO, USA)

- Led a proposal of convective modes, time slots, and zones for possible operational severe weather warnings
- Initiated a proposal of thermodynamic, moisture, and wind indexes for pre-convective environment description for operational forecasting
- Conducted statistical analysis of the ERA5 reanalysis performance over the lake: comparison with Kenya sounding data and hydrometeorological automatic weather stations

- Have initiated an analysis of the potential of dual-polarimetric radar data for automatic severe storm intensification and warnings using the S-band Tanzania radar, and the TITAN identification and tracking algorithm (NCAR)

04/2021 - 08/2021 - Postdoctoral Fellow, *Centro Internazionale di Ricerca in Monitoraggio Ambientale -CIMA Research Foundation (Savona, Italy)*

- Collaborated in an aerosol load sensitivity test study in the Caribbean using the Aerosol-Aware Thompson Microphysics Scheme in WRF model, initialized with an ERA5-forced ensemble with stochastic perturbations

03/2019 - 08/2019 - Advance Study Program- Graduate Visitor, *National Center for Atmospheric Research, NCAR (Boulder, CO, USA)*

- Led the implementation of the dual-Doppler technique for the first time in a southern European country with an operational C-band weather radar network
- Led a study of the influence of topography storm propagation and 3D wind fields of severe storms in Catalonia using observational and modeling (WRF) datasets

02/2019 - 03/2019 - Research and Applied Counseling contract in Meteorology and Hydrology, *Fundació Bosch i Gimpera (Barcelona, Spain)*

- Led a temporal and spatial climate study in the Salou basin for a temporary period of 5 years, and report writing for final stakeholders, using the radar-based storm identification, and tracking algorithm developed in the Ph.D.

09/2017 - 08/2018 - Weekend weather forecaster in the radio program, "Hour L", *Radio Cadena SER Catalunya Central (Spain)*

11/2015 - 10/2018 - Research and Teaching Assistant Contract, *University of Barcelona, Faculty of Physics (Barcelona, Spain)*

- Led the current improvements of the radar-based identification and tracking algorithm at the Meteorological Service of Catalonia: (i) implemented a new dual six-threshold technique to identify individual convective cores in clusters; (ii) implemented a volumetric overlapping technique to identify in advance possible split/merge processes in storms; (iii) implemented a dynamic thresholding technique to track storms to obtain more realistic life cycle features.
- Led the development of algorithms for processing radar data and derived products
- Led and collaborated in statistical analysis and treatment of remote sensing and station data: lightning, satellite, radar, sounding, and rainfall gauges

09/2014 - 09/2015 - Internship at the Meteorological Service of Catalonia, *Servei Meteorològic de Catalunya (Barcelona, Spain)*

- Daily monitoring of the correct operation of the Remote Sensing and Radio Sounding team products and instrumentation networks
- Translation of the operational satellite-based fog detection product algorithm from IDL to R-Cran
- R-based script development to obtain, process, georeferenced, and visualize operational EUMETSAT MSG-2 satellite products

07/2012 - 08/2012 - Internship at the Ebro Observatory, *Observatori de l'Ebre (Roquetes, Spain)*

- Collaborated in an analysis of the thermal variability of the operational magnetometers at the Ebro observatory

ARTICLES IN INDEXED JOURNALS

- del Moral Méndez, A.,** R.D. Roberts, T.M. Weckwerth, and J.W. Wilson. (2024) Towards improved short-term forecasting for Lake Vitoria Basin: Part II - Pre-convective environment analysis with ERA5, *submitted to Mon. Wea. Rev. (under review)*
- del Moral Méndez, A.,** T.M. Weckwerth, R.D. Roberts, and J.W. Wilson. (2023). Toward Improved Short-Term Forecasting for Lake Victoria Basin. Part I: A Radar-Based Convective Mode Analysis. *Wea. Forecasting*, 38, 3509-2526, <https://doi.org/10.1175/WAF-D-23-0039.1>
- Tartaglione, N., Desbiolles, F., **del Moral-Méndez, A.,** Meroni, A. N., Napoli, A., Borgnino, M., Parodi, A., and Pasquero, C. (2024). Low cloud response to aerosol-radiation-cloud interactions: Idealized WRF numerical experiments for EUREC⁴A project. *Atmos. Sci. Lett.*, e1208. <https://doi.org/10.1002/asl.1208>
- Llasat, M. C., **del Moral, A.,** Cortès, M., and Rigo, T. (2021). Convective precipitation trends in the Spanish Mediterranean region. *Atmos. Res.*, 257, 105581. <https://doi.org/10.1016/j.atmosres.2021.105581>
- del Moral, A.,** Weckwerth, T.M., Rigo, T., Bell, M.M., Llasat, M.C (2020). C-Band Dual-Doppler Retrievals in Complex Terrain: Improving the Knowledge of Severe Storm Dynamics in Catalonia. *Remote Sensing*, 12(18), 2930, <https://doi.org/10.3390/rs12182930>
- del Moral, A.,** Llasat, M.C and Rigo, T. (2020). Connecting flash flood events with radar-derived convective storm characteristics on the northwestern Mediterranean coast: knowing the present for better future scenarios adaptation. *Atmos. Res*, 238, <https://doi.org/10.1016/j.atmosres.2020.104863>
- Rehbein, A., M, Rugna, M., Hobouchian, M. P., **del Moral, A.,** Goodman, S. J., Lindsey, D. T., Thomas, J. (2020). A Workshop on the Next Generation Environmental Satellite Constellations. *Bull. Amer. Meteorol. Soc.*, 101, E763–E770, <https://doi.org/10.1175/BAMS-D-19-0349.1>.
- del Moral, A.,** Rigo, T. and Llasat, M.C. (2018). A radar-based centroid tracking algorithm for severe weather surveillance: identifying split/merge processes in convective systems. *Atmos. Res.*, 213, 110-120, ISSN 0169-8095, <https://doi.org/10.1016/j.atmosres.2018.05.030>.
- del Moral, A.,** Llasat, M.C and Rigo, T. (2016) Identification of anomalous motion of thunderstorms using daily rainfall fields. *Atmos.Res.*, 185, 92-100, ISSN 0169-8095, <https://doi.org/10.1016/j.atmosres.2016.11.001>

FIELD WORK

09/2023-09/2025 – Idaho Department of Water Resource Cloud Seeding Experiment(US)

- In charge of the NSF NCAR X-pol siting, and operations. Design of scanning the radar strategies for the experiment, radar monitoring, data quality control, and analysis.

03/2022 - 04/2022 - PERiLS (Propagation, Evolution, and Rotation in Linear Storms) (US)

09/2019 - HaL (Hurricanes at Landfall) (US)

05/2019 - TWIRL (Tornadic Winds: In-situ and Radar observation at Low levels), *Oklahoma/Texas, USA*

10/2018 - 12/2018 - RELAMPAGO (Remote sensing of Electrification, Lightning, And Mesoscale/microscale Processes with Adaptive Ground Observations) (*Argentina*)

- Co-principal operator of the mobile C-band radar: software and hardware manipulation, scanning strategy changes, and manipulation of the transmitter and receiver
- Recording of radar and meteorological data in real-time with C-band, and deploying PODs in severe weather environments
- Manual synchronized sounding launching and data recording

LEADERSHIP/ SERVICE/MENTORSHIP

05/2024 -present - Doppler On Wheels (DOW, UIUC) radar facility external advisory committee

04/2024 -present - NCAR Convergence Science Program Ambassador, NSF NCAR

03/2024 - Workshop organization committee, UCAR Africa Initiative Workshop, Boulder, CO

2023 -present - Early Career Scientists Assembly Steering Committee (ECSA-SC) member, NSF NCAR

2021-2024 - Postdoctoral Professional Development Committee member, NSF NCAR

2021-2023 - Committee for Hispanic and Latinx Advancement, Academia Ambassadors co-lead: AMS

02/2022 - Science Talk/mentorship, Meteorological Experimentation Course, Sophomore level – SUNY-Oswego

06/2022 - Ph.D. Student Co-Advisor, NCAR's Advanced Study Program's Bridge Graduate Visitor Program (GVP) Fellowship

11/2021 - Ph.D. Defense Committee member- Dr. Albert Salvador Yuste, UPC (Spain)

07/2017 - Conference local organization committee, 10th HyMeX Workshop Barcelona

02/2018 - 06/2018 - Bachelor of Physics Student Co-Advisor: degree final project, UB (Spain)

TEACHING

2017- 2021 - La Universitat de l'Experiència, UB (Spain)

Remote exploration of the atmosphere: Weather radar

History of Meteorology and Instrumentation

Microphysics of clouds and precipitation I and II

Advanced instrumentation and experimental campaigns

Fieldwork: Fabra Observatory and Barcelona rainwater tanks

2016 -2020 - Gaudir UB, UB (Spain)

Weather and Basic Concepts of Meteorology

Observing Weather and Climate

2015 - 2018 - Official Physics B.S., UB (Spain)

Fundamentals of Laboratory

Differential Equations and Vectorial Calculus

Meteorology and Climatology

CONTRIBUTIONS TO OTHER SCIENTIFIC PROJECTS

2021 - EUREC4A-OA: Improving the representation of small-scale nonlinear ocean-atmosphere interactions in climate models by innovative joint observing and modeling approaches, *EU*

2007 - 2020 – HYMEX (HYdrological cycle in the Mediterranean EXperiment), *EU*

2018 - 2020 - PIRAGUA: Evaluation and prospective of the water resources of the Pyrenees in a context of Climate Change, and adaptation measures with impact on the territory (*in Spanish*), *EU*

2018 - A journey through droughts and floods in our city. from witnesses to leaders (*in Catalan*), *Spain*

2018 - 2020 - M-CostAdapt: Adaptation routes to Climate Change in the Mediterranean coastal zone. Overcoming the limits of adaptability

(*in Spanish*), *Spain*

2017 – Weather explorers: Discovering natural risks in Barcelona and the role of citizens in their knowledge (*in Catalan*), *Spain*

2015 - 2017 HOPE: Holistic analysis of the impact of extreme rainfall and flooding and their introduction in future scenarios. Application to adaptation and resilience strategies (*in Spanish*), *Spain*

2014 - 2015 - FLOOD-UP. Exploring our resilience in flash floods (*in Spanish*), *Spain*

TRAINING/ WORKSHOPS/ SUMMER SCHOOLS

2024 - NSF NCAR Early Career Leadership Program (ECLP), Boulder, CO, USA

2024 - New Lenses for Engagement virtual workshop (relationship-building with historically marginalized and at-risk communities with the Earth system science), *Boulder, CO, USA*

2019 - NOAA/NASA Satellite Meteorology Summer Workshop, Cooperative Institute for Research in the Atmosphere, Fort Collins, CO, USA

2019 - Joint WRF and MPAS Users' Workshop, National Center for Atmospheric Research, Boulder, CO, USA

2018 - 7th CNR/ISAC Summer School on Precipitation: Remote Sensing and Modeling, Italian National Research Council, Lecce, Italy

2017 - Forecasting of Severe Convective Storms, 9th European Conference on Severe Storms – Pula, Croatia

CONFERENCE PRESENTATIONS (LAST, MORE RELEVANT)

2023 - Towards improved near-term forecasting for Lake Victoria Basin: convective diurnal cycle over the lake, WCRP Open Science Conference, Kigali (Rwanda)

2023 - Pre-convective environments for Lake Victoria using ERA5 reanalysis: identifying severe weather indexes for enhanced forecasts, WCRP Open Science Conference, Kigali (Rwanda)

2023 - Radar polarimetric signatures of severe convective storms: towards an Early Warning System for Lake Victoria Basin, WCRP Open Science Conference, Kigali (Rwanda)

2022 – Joint EOL/CyPRESS Seminar: Towards Improved Short-Term Forecasting for Lake Victoria Basin: Exploring HIGHWAY field campaign data, National Center for Atmospheric Research, Boulder (US)

2022 – ASP Research Review Seminars: Studying severe convection over Lake Victoria: Towards an improved near-term forecasting, National Center for Atmospheric Research, Boulder (US)

2022 - Exploring the polarimetric capabilities of the S-band Mwanza radar in Tanzania, Africa: Towards an Early Warning System in Lake Victoria Basin, 11th European Conference on Radar in Meteorology and Hydrology, Locarno (Switzerland)

2022 - Towards a better understanding of the convective diurnal cycle on Lake Victoria, 4th European Nowcasting Conference (virtual)

2022 - A first glimpse of severe storms over Lake Victoria basin: A radar-based convective mode analysis, 100th American Meteorological Society Annual Meeting (virtual)

2020 - Assessing Anomalous Propagation of Convective Storms in Complex Terrain: Using a Combined Dual-Doppler and Modeling Approach, 100th American Meteorological Society Annual Meeting, Boston, (USA)

2019 - Towards a better understanding of the role of topography in the motion of severe storms in Catalonia: First results with C-band dual-Doppler analysis, 10th European Conference on Severe Storms, Krakow (Poland)

2019 - A radar-based climatological study of the Salou region thunderstorms: knowing the present for better future scenarios adaptation, 12th HyMex workshop, Split (Croatia)

2018 - Can we predict changes in the trajectories of thunderstorms bearing severe weather? 16th Plinius Conference on Mediterranean Risks, Montpellier (France)

SCIENCE OUTREACH

2024 - Conference: NCAR Explorer Series: Thunderstorms around the world: how observations can help save lives Boulder, CO (US)

2020 - Conference: We have scientific talent, Sant Joan de Vilatorrada townhall (Spain)

2018 - Workshop: Get into the world of floods, The Youth Mobile Festival: YoMo Barcelona (Spain)

2018 - Workshop: Exploring the natural risks in the city, IV Science Festival, University of Barcelona (Spain)

2018 - Workshop: Weather explorers, MAGNET program (Spain)

2016 - Exposition: Let's talk about weather: History of meteorological fondness, Olot Volcanology Museum

2018 - 2019 Exposition: Weather Explorers, University of Barcelona, and Civic Centers

COMPUTATIONAL/PROGRAMMING SKILLS

R-Cran; Python; Bash scripting (basic level); Q-GIS; Radar data programs (i.e., SOLO3, SAMURAI, LROSE);
Weather and Research Forecasting model (WRF)

SPANISH TRANSLATION SERVICE AND LANGUAGES

2022 - Handbook: Climate Myth Debunking for TV Meteorologists,

<https://www.climatechangecommunication.org/wpcontent/uploads/2022/01/Climate-Myth-Debunking-for-Broadcast-Meteorologists.pdf>

Fluent in English, Catalan, and Spanish