ANNA DEL MORAL MÉNDEZ
Boulder, CO 80301 ● annadelmoral1@gmail.com

ACADEMIC EDUCATION

2020 - Applied Physics – Meteorology, PhD. Cum Laude, *University of Barcelona (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., *University of Barcelona (Spain)*
Thesis: Identification of anomalous motion of thunderstorms using radar and satellite data
2014 - Physics, B.S., *University of Barcelona (Spain)*

AWARDS RECEIVED

2020 - Early Career Scientists Assembly (ECSA) Steering Committee Travel Award, *National Center for Atmospheric Research*
2019 - Advanced Study Program-Graduate Visitor Program, *National Center for Atmospheric Research*
2018 - ERAD Travel Support, *10th European Conference on Radar in Meteorology and Hydrology*
2017 - Young Scientist Travel Award (YSTA), *European Meteorological Society*
2016 - EGU Support Award for Early Career Scientist, *EGU Secretary Office, and 15th Plinius Scientific Committee*
2016 and 2017 - Travel Award, *University of Barcelona*

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*

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

10/2021 - present - Advance Study Program- Postdoctoral Fellow, *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. (*under internal review, 2024*) Towards improved short-term forecasting for Lake Vitoria Basin: Part II - Pre-convective environment analysis with ERA5

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 EUREC^{4}A 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, *Idaho, USA*
▪ 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), *South-East USA*
09/2019 - HaL (Hurricanes at Landfall), *Florida, USA*
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)*, Córdoba, 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

2023 -present - Early Career Scientists Assembly Steering Committee (ECSA-SC) member, *National Center for Atmospheric Research*
2021-present - Committee for Hispanic and Latinx Advancement, Academia Ambassadors co-lead: *American Meteorology Society*
2021-present - Postdoctoral Professional Development Committee member, *National Center for Atmospheric Research*
02/2022 - Science Talk/mentorship, **Meteorological Experimentation Course, Sophomore level** – *SUNY-SOWEGO University, NY*
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, *Polytechnical University of Catalonia (Spain)*
07/2017 - Conference local organization committee, *10th HyMeX Workshop Barcelona, Barcelona (Spain)*
02/2018 - 06/2018 - Bachelor of Physics Student Co-Advisor: degree final project*, University of Barcelona, Faculty of Physics*

TEACHING

2017- 2021 - La Universitat de l'Experiència, *University of Barcelona (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*, University of Barcelona (Spain*)
Weather and Basic Concepts of Meteorology
Observing Weather and Climate

2015 - 2018 - Official Physics B.S., *University of Barcelona (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 (i*n 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 Terran: 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)*

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)*

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 (Spain)*

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