

CURRICULUM VITAE

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION		CV date	11/07/2023
First name	MARTA		
Family name	MARTÍN DEL REY		
Gender (*)	Female	Birth date (dd/mm/yyyy)	25/02/1985
Social Security, Passport, ID number	70884529R		
e-mail	martam01@ucm.es	URL Web	http://tropa.fis.ucm.es/members/23
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-6234-0447		

(*) Mandatory

A.1. Current position

Position	Postdoctoral Researcher Juan de la Cierva Incorporación		
Initial date	01/02/2021		
Institution	Universidad Complutense de Madrid		
Department/Center	FTA	Facultad de Ciencias Físicas	
Country	Spain	Teleph. number	676070298
Key words	Tropical climate variability, air-sea interactions, ocean dynamics, ocean waves, teleconnections, ocean modelling, climate-health		

A.2. Previous positions (research activity interruptions, see call)

Period	Position/Institution/Country/Interruption cause
16/01/2019-15/01/2021	Marie Skłodowska-Curie Postdoctoral researcher (MSCA-IF-FESTIVAL, grant agreement 797236). ICM-CSIC. Barcelona (Spain).
1/10/2017-31/12/2018	Postdoctoral researcher under MORDICUS project (ANR-13-SENV-0002). CERFACS. Toulouse (France).
01/05/2015-30/09/2017	Postdoctoral researcher under PREFACE-EU project (grant agreement 603521). LOCEAN-IPSL. Paris (France).
01/04/2010-31/05/2015	PhD researcher under national TRACS (CGL2009-10285), MULCLIVAR (CGL2012-38923-C02-01) and CGL2011-13564-E projects. Universidad Complutense de Madrid (UCM). Madrid (Spain).

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Physics	Universidad Complutense de Madrid	2015
Master in Geophysics and Meteorology	Universidad Complutense de Madrid	2010
5-yr Degree in Physics	Universidad de Salamanca	2008

Part B. CV SUMMARY

Currently, I am a postdoctoral Juan de la Cierva Incorporación researcher with broad expertise in tropical Atlantic variability, air-sea interactions, ocean waves and climate modelling. I have **16 peer-review publications** (14 of them in Q1), **1 book chapter** and **1 CLIVAR review report** and I have been engaged in **25 research projects**: 4 international projects, 9 Spanish projects, 2 French projects, 6 cooperation projects and 4 projects of innovative education. I **co-supervise 2 on-going PhD theses**, 1 on-going JAE-intro fellowship and co-supervised 1 degree thesis and 4 master theses.

During my PhD, I gained wide knowledge about tropical interannual variability, air-sea interactions and climate teleconnections. The existence during certain decades of an inter-basin connection between the El Niño-Southern Oscillation (ENSO) and the Atlantic Zonal Mode (AZM) was demonstrated and the associated air-sea mechanisms were described. Our findings implied **a modification of the prevailing paradigm of global climate** focused on ENSO and brought to light the crucial role of the Atlantic Ocean to anticipate ENSO development (Martín-Rey et al. 2012; Polo et al. 2015) and to modulate the emergence of this interbasin connection at multidecadal time scales (Martín-Rey et al. 2014). It **opens windows of opportunity for ENSO predictability** (Martín-Rey et al. 2015) and **helps to improve the current seasonal-to-decadal climate forecast**. This research, developed in collaboration with researchers from ITCP and was funded by [TRACS](#) and [MULCLIVAR](#). My contribution to this knowledge allowed me to participate as **co-author in a review paper about tropical basin interaction in [Science](#)**.

During my pre-doctoral stays in LOCEAN-IPSL, I **developed expertise in the installation and performance of simulations with the ocean NEMO model**. As part of this international collaboration, we found that the emergence, amplitude, and spatial configuration of the tropical Atlantic variability modes change under distinct phases of the Atlantic Multidecadal Variability (Martín-Rey et al. 2018). It gave **a step forward to a better understanding of the tropical Atlantic climate** and helped to conciliate the diversity of AZM patterns reported in the literature. Remarkably, we provided robust evidence about **the active role of the Atlantic background state in the activation of ocean dynamics**, which shape the timing and structure of different AZM (Martín-Rey et al. 2019).

During my postdoctoral contract in LOCEAN-IPSL under [PREFACE](#) project, the thermodynamic and dynamic processes underlying the development of Atlantic Meridional Mode (AMM) and its potential connection with AZM were determined. We demonstrate that the effectiveness and type of AMM-AZM link depends on the competition between equatorial winds and remotely-forced oceanic waves (Martín-Rey and Lazar 2019). This was **the seed that led the topic for my MSCA-IF FESTIVAL grant**. During my second postdoctoral contract in CERFACS I **improved my skills in climate modelling by performing the pacemaker simulations** for the [PRIMAVERA-EU](#) and [MORDICUS](#) project and gained **more research independency** by initiating collaborations with foreign researchers that gave rise in two community papers (Ruprich-Robert et al. 2021; Hodson et al. 2022). During this period, I improved my skills in climate modelling and gain further knowledge about decadal natural variability.

During 2019-2021, I **become a fully independent researcher by getting my own funding** through the prestigious competitive Marie Skłodowska Curie Action (MSCA-IF-FESTIVAL) and allowed me to **start a new promising research line**: the connection between boreal spring AMM and summer AZM and its impacts on tropical climate (Martín-Rey et al. 2023). I also collaborated with researchers from ICM-CSIC to explore the upper-ocean circulation and transport in the North Brazil retroflexion (Vallès-Casanova et al. 2022).

I **have consolidated my scientific leadership** through my role of PI in the projects MSCA-IF-FESTIVAL, ENMASCARADO and as co-coordinator in CLIMATE-COVID project. The latter provides me the opportunity to **initiate another interesting research line: climate-health linkages**. The relationship between climatic variables and the development of COVID19 pandemic in Barcelone, was explored (Planella-Morató et al. 2023, under review). During my research career I have **developed my own scientific network and gained international recognition** reflected in my participation as co-author in several review papers, [1 CLIVAR scientific report](#), [1 book chapter](#) and with 5 publications cited in the latest [IPCC 2021 report](#). From 2019, I am convener of an [EGU session](#) about tropical Atlantic climate and I have also co-organized national and international workshops.

Finally, I have an active participation in **outreach activities** through my engagement in 4 projects of innovative education and by holding scientific workshops and participated as scientific communicator in high-schools.

Part C. RELEVANT MERITS

C.1. Publications



From [Google Scholar](#): h-index: 12; Total number of Citations: 1116. From [Scopus](#): h-index: 11. Total number of Citations: 832. I have a total of **16 peer-review publications** (14 of them in Q1), **1 book chapter** and **1 CLIVAR review report**. The most remarkable ones are enumerated as follows:

1. **Martín-Rey M**, I Vallès-Casanova and JL Pelegrí (1/3) (2023). Upper ocean circulation and tropical Atlantic interannual modes, *J Clim*, 36(8), 2625–2643, DOI: <https://doi.org/10.1175/JCLI-D-22-0184.1> (citations: 0).
2. Cai W, Wu L, Lengaigne M, ... and Chang P (22/34) (2019). Pan-tropical climate interactions, *Science*, 363 (6430), eaav4236, DOI: [10.1126/science.aav4236](https://doi.org/10.1126/science.aav4236) (cites: 417)
3. Foltz GR, Brandt P, Richter I, ... and Reul N (16/66) (2019). The Tropical Atlantic Observing System, *Front. Mar. Sci.*, 6, 206, <https://doi.org/10.3389/fmars.2019.00206>. (cites: 88)
4. **Martín-Rey M** and A Lazar (2019). Is the boreal spring tropical Atlantic variability a precursor of the Equatorial Mode? *Clim Dyn*, 53(3), 2339-2353. <https://doi.org/10.1007/s00382-019-04851-9>. (cites: 15)
5. **Martín-Rey M**, Polo I, Rodríguez-Fonseca B, ... and Losada, T (1/5) (2019). Ocean dynamics shapes the structure and timing of Atlantic Equatorial Modes. *JGR Oceans*, 124, 7529-7544. <https://doi.org/10.1029/2019JC015030>. (cites: 11)
6. Lübbecke J, Rodríguez-Fonseca B, Richter I, **Martín-Rey M**, Losada T, Polo I, Keenlyside N (4/7) (2018). Equatorial Atlantic variability – modes, mechanisms, and global teleconnections. *WIREs Climate Change*, 9(4), e527. DOI: <https://doi.org/10.1002/wcc.527>. (citations: 99)
7. **Martín-Rey M**, I Polo, B Rodríguez-Fonseca ... and A Lazar (1/5) (2018). Is there evidence of changes in Tropical Atlantic Variability modes under AMO phases in the observational record? *J. Climate*, 31 (2), 515-536. <https://doi.org/10.1175/JCLI-D-16-0459.1> (cites:64)
8. Polo I, **M Martín-Rey**, B Rodríguez-Fonseca ... and F Kucharski (2/5) (2015). Processes in the Pacific La Niña onset triggered by the Atlantic Niño, *Clim. Dyn.*, 44(1), 115-131. DOI [10.1007/s00382-014-2354-7](https://doi.org/10.1007/s00382-014-2354-7) (cites: 105)
9. **Martín-Rey M**, B Rodríguez-Fonseca, I Polo (1/3) (2015) Atlantic opportunities for ENSO prediction, *Geophys Res Lett*, 42(16), 6802-6810. <https://doi.org/10.1002/2015GL065062>. (cites: 58)
10. **Martín-Rey M**, B Rodríguez-Fonseca, I Polo and F Kucharski (1/4) (2014). On the Atlantic-Pacific Niños connection: An Atlantic Multidecadal Oscillation modulated mode, *Clim. Dyn.*, 43(11), 3163-3178. doi: [10.1007/s00382-014-2305-3](https://doi.org/10.1007/s00382-014-2305-3). (cites:77)

C.2. Congress

I have acquired broad expertise in the dissemination of the results obtained along my research career through **more than 70 contributions** to national (11) and international (65) meetings, most of them as first author (45/71) and with a total of 28 oral presentations. The most representative contributions are enumerated as follows:

1. **M Martín-Rey** and TROPA group (2023), Low frequency modulation of interannual Atlantic Variability, Oral presentation (Invited talk) in the workshop “Tropical Atlantic basin hydroclimate change: learning from long instrumental records”, Bern (Switzerland), from 16th to 18th May, 2023.
2. **M Martín-Rey**, I Vallès-Casanova and JL Pelegrí (2023) Response of the upper ocean circulation to tropical Atlantic interannual modes. Poster presentation in CLIVAR 2023 Towards an integrated view of climate, Madrid (Spain), from 24th to 26th January, 2023.
3. I Polo, **M Martín-Rey**, E Calvo-Miguélez, I Gómará, B Rodríguez-Fonseca, T Losada, E Mohino (2022), Connection between marine ecosystems in the Tropical Atlantic via oceanic wave propagation, Poster presentation in PIRATA & TRIATLAS Conference & General Assembly, from 3th to 5th October, 2022.
4. **M Martín-Rey**, JL Pelegrí, E Sánchez-Gómez and C Cassou (2019), Interaction between the boreal spring and summer Tropical Atlantic interannual variability modes, Poster. AGU Fall Meeting, San Francisco (EEUU), December 8-13.
5. **M Martín-Rey**, B Rodríguez-Fonseca and I Polo (2018) Atlantic-Pacific connection, 2nd Workshop on ‘Pan-tropical inter-basin climate interactions’, Oral. Jeju (South Korea), August 22 - 25.
6. **M Martín-Rey**, C Cassou, E Sánchez-Gómez and M Drouard (2018), Role of the ocean dynamics in ENSO-tropical Atlantic teleconnection under warmer climate. Oral. PREFACE International Conference on Ocean, Climate and Ecosystems, Arrecife, Lanzarote (Spain), April 17-20.



7. M Martín-Rey and A Lazar (2016), Oceanic processes involved in the development and decay of the Meridional Mode, AGU meeting, Poster presentation in San Francisco (California, US), from December 12 to 18.

8. M Martín-Rey, I Polo, B Rodríguez-Fonseca, T Losada and A Lazar (2016), On the inter-annual tropical Atlantic variability modes under negative AMO phases, Oral presentation in CLIVAR-TAV PIRATA-PREFACE meeting, Paris (France), from November 28th to December 2nd, 2016.

9. M Martín-Rey, B Rodríguez-Fonseca, I Polo, Atlantic Opportunities for ENSO prediction (2014). Oral. EGU General Assembly, Viena (Austria), from April 27 to May 2.

10. M Martín-Rey, I Polo, B Rodríguez-Fonseca and Fred Kucharski (2011) The Atlantic impact on Pacific El Niño: A important source of predictability for the Euro-Atlantic region. Poster. WCRP OSC, Denver (Colorado), October 24 -28.

C.3. Research projects

During my research career, I have been engaged in **25 research projects: 4 international projects, 9 Spanish projects, 2 French projects, 6 cooperation projects and 4 projects of innovative education.** I would like to highlight my contribution in the following ones:

1. Oceans For Future ([OFF](#), TED2021-130106B-I00). PI: Irene Polo Sánchez and Belén Rodríguez de Fonseca (UCM). Funding: 264.500€. Spanish MICCIN. December 2022-December 2024. Participant as climate researcher that explores the changes in the climate-health and climate-marine ecosystems linkages in present climate and future scenarios.

2. Decadal modulations of Tropical Basin Interactions and impacts ([DISTROPIA](#), PID2021-125806NB-I00). PI: Teresa Losada Doval and Elsa Mohino Harris (UCM). Funding: 179.080€. Spanish MICCIN. September 2022- September 2025. Participant as climate researcher focused on the air-sea mechanisms involved in the AMM-AZM connection and its impact on upwelling regions. Co-supervisor of the PhD thesis of Lucía Montoya aimed to explore the role of the background state in the modulation of the AZM and the activation of the tropical basin interactions.

3. Consolidación de la red inter-universitaria migracioneS climáticas y refugiad@s y transferencia a la sociedad ([ENMASCARADO](#), VR. 28/22). PI: Marta Martín del Rey (UCM). Funding: 4722€ UCM. April 2022- December 2022. Principal investigator of the project aimed to consolidate the scientific network [MASCARAS](#) and develop a multidisciplinary monograph about climate migrations.

4. Multidecadal Modulations and Tropical Basin interaction ([TBI-MULMOD](#), LINKA20411). PI: Belén Rodríguez de Fonseca (IGEO). Funding: 21.080€, CSIC i-Link action. 1 January 2022- 31 December 2023. Participant as climate researcher that explore the impact of tropical Atlantic variability in the predictability of ENSO phenomenon.

5. Study of Climate variability in West Africa for a sustainable society (COOPB20632). PI: Belén Rodríguez de Fonseca (IGEO). Funding: 23.853,72€, CSIC i-COOP action. 1 January 2022- 31 December 2023. Participant as co-supervisor of the PhD thesis of Mame Diarra Diouf about the climate impact on Meningococcal Meningitis and COVID-19 over West Africa.

6. Next Generation Earth Modelling Systems ([NEXTGEMS](#), grant agreement 101003470. PI: Bjorn Stevens (MPI). UCM coordinator: Elsa Mohino. Funding: 11.000.000€ (EU-H2020). September 2021-August 2025. Participant as climate researcher that studies the changes in the tropical Atlantic variability modes under global warming conditions in high-resolution climate models.

7. Tropical and South Atlantic Climate-based Marine Ecosystem Prediction for Sustainable Management ([TRIATLAS](#), grant agreement 817578). PI: Noel Keenlyside (UiB). UCM coordinator: Belén Rodríguez de Fonseca. Funding: 11.074.400€, EU-H2020. June 2019- May 2023. Participant as climate researcher that studies the impacts of Atlantic Meridional and Zonal modes in the upper ocean circulation and upwelling systems in the Tropical Atlantic.

8. Cross-analysis of climatic and COVID19 data ([CLIMATE-COVID19](#), PIM-E-202030E222). Funding: 80.650€ CSIC-ISCI. PI: Jose Luis Pelegrí (ICM). July 2020-July 2021. Co-coordinator of the project that investigated the leading role of climatic factors in the COVID19 outbreaks and propagation in Catalonia (Spain).

9. From boreal spring to summer Tropical Atlantic inter-annual variability ([MSCA-IF-H2020-FESTIVAL](#), grant agreement 797236). Funding: 158.121€, H2020-EU. PI: Marta Martín del Rey (ICM); Research Coordinator: Jose Luis Pelegrí (ICM). 2019-2021. PI of the project and the new research line about the connection between the Atlantic Meridional and Atlantic Zonal modes.



10. Enhancing prediction of Tropical Atlantic climate and its impacts (PREFACE, grant agreement 603521. Funding: 12M€ H2020-EU. PI: Noel Keenlyside (UiB). 2013-2017. Postdoctoral researcher responsible of the study of the air-sea mechanisms and multidecadal changes experienced by the tropical Atlantic variability modes and associated impacts.

C.4. Teaching activities

2023-ongoing: Co-advisor. PhD thesis of Lucía Montoya Carramolino. UCM
2022-ongoing: Co-advisor. PhD thesis of Mame Diarra Diouf. UCM-UCAD
2023: Co-advisor. JAE-intro (JAEINT22_EX0362) of Victor Galván. IGEO (CSIC-UCM)
2021-2022: Co-advisor. Master thesis “Modelo conceptual del fenómeno el Niño y la Oscilación del Sur (ENSO): El oscilador recargado”. Carolina Lucía Miranda García. USAL-UCM.
2021-2022: Co-advisor. Master thesis “Impacto de la localización de la convección tropical en los modos de variabilidad del Atlántico tropical”. Lucía Montoya Carramolino. UCM
2018-2019: Co-advisor. Master thesis “Analysis of the ENSO-Tropical Atlantic-European precipitation teleconnection in the seasonal forecast system DePreSys3”. Enrique Prego. UCM.
2018-2019: Co-advisor. Degree thesis “Temperature-salinity clustering of the Atlantic Ocean”. Naina González. ICM-UB.
2015-2016: Co-advisor. Master thesis “Influencia del ENSO en la variabilidad del Atlántico tropical”. Nerea Betancort. UCM.

C.5. Other merits

Stays in foreign research centres

Oct 2017- Dec 2018 (15 months): Postdoctoral contract in CERFACS, Toulouse (France).
May 2015-Sep 2017 (28 months): Postdoctoral contract in LOCEAN-IPSL, UPMC, Paris (France).
Oct 2012- Dec 2012 (2.5 months): Pre-doctoral stay in LOCEAN-IPSL, UPMC, Paris (France).
Sep 2011- Dec 2011 (3 months): Pre-doctoral stay in LOCEAN-IPSL, UPMC, Paris (France).

Organization of Seminars and workshops

2019, 2021-2023: Organization and convener of the session about tropical Climate (CL4.24/AS1.20/OS1.32; OS1.4/AS2/CL4; OS1.8/AS2/CL2; OS1.6) in the EGU General Assembly (Viena, Austria).
2016: Co-organization and development of the International CLIVAR-TAV PIRATA -PREFACE Meeting. Paris, November 28 –December 2

Outreach activities

Nov 2022: Coordination and development of the workshop "Entendiendo el cambio climático" in Instituto de Geociencias IGEO (CSIC), in the framework of the “Science week” organized by the Comunidad de Madrid.

March 2022: Workshop “Climate Laboratory” in the framework of “Programa de Enriquecimiento Educativo para Alumnos con Altas Capacidades (PEAC)”. IES Antonio Machado, Madrid (Spain).

March 2022: [Interview](#) in the news media of Telemadrid in the framework of the “Woman’s day”

Feb 2022: [Divulgative video](#) as a women postdoctoral research of IGEO as mentoring in the in the framework of the “International Day of Women and Girls in Science”, IGEO, CSIC, Madrid (Spain).

Nov 2021: Creation of [scientific news](#) for educational activities in the framework of “Geociencias en el cole” for Primary and High Schools in Madrid (Spain).

May 2021: Workshop “Meteolab. Las claves del cambio climático” in the frame of the project “Ciencia en el barrio” in the High School IES Arcipreste de Hita in Madrid (Spain).

March, 2019: Interview in the radio programme Planeta Vivo: <https://planetavivoradio.com/programa-528/>

June 2018: Euroscience Open Forum position (ESOF2018). Femmes & Sciences CNRS, Toulouse.

2011 - 2012: Participation in development of the Virtual Laboratory of Climate and Meteorology (<http://meteolab.fis.ucm.es/>).

2009 – 2010 , 2013 – 2014, 2021: Participation in the “Workshop of Atmosphere and Ocean” in the “Science week” organized by the Comunidad de Madrid.