

Dr. Damian L. Arévalo-Martínez

Curriculum Vitae

Personal information

Place of birth: Bogota, Colombia

Nationality: German

Languages: German (fluent), English (fluent), Spanish (native)

Research interests

I am a sea-going chemical oceanographer that investigates the biogeochemical cycling of climate-relevant trace gases (e.g. N₂O, CH₄, CO, CO₂). My research focuses on improving our understanding of the exchange fluxes of these gases across the boundaries between hydrosphere, biosphere, cryosphere and atmosphere. I am also interested in land-ocean connectivity processes through groundwater. Regionally I focus in low-oxygen environments (coastal and open ocean) as well as subpolar and polar marine ecosystems.

Education and qualifications

2012–2015 Ph.D., Kiel University, Germany (*magna cum laude*)

2009–2012 M.Sc. Biological Oceanography, Kiel University, Germany

2002–2008 B.Sc. Marine Biology, Universidad Jorge Tadeo Lozano, Colombia

Appointments

2025– Researcher. Leibniz Institute for Baltic Sea Research Warnemünde, Germany

Theme: *Greenhouse gas cycling in marine sediments of the Baltic Sea*

2022–2024 Marie Curie Postdoctoral Fellow. Radboud University, Netherlands

Theme: *Cycling and emissions of nitrous oxide under coastal hypoxia*

2022– Guest Researcher. GEOMAR Helmholtz Centre for Ocean Research Kiel

Theme: *Exchange fluxes of greenhouse gases*

2021–2022 Postdoctoral Researcher. GEOMAR Helmholtz Centre for Ocean Research Kiel

Theme: *Chemical monitoring concept in coastal waters of the North and Baltic Seas*

2020–2022 Postdoctoral Researcher. Institute of Geosciences at Kiel University

Theme: *Land-ocean connectivity through groundwater*

2017–2020 Postdoctoral Researcher. GEOMAR Helmholtz Centre for Ocean Research Kiel

Theme: *Impact of ocean acidification on nitrous oxide cycling in the Southern Ocean*

2016–2017 Postdoctoral Researcher. GEOMAR Helmholtz Centre for Ocean Research Kiel

Theme: *Marine cycling of carbon monoxide*

2015–2016 Postdoctoral Researcher. GEOMAR Helmholtz Centre for Ocean Research Kiel

Theme: *Biogeochemistry of trace gases in oxygen minimum zones*

2012–2015 Doctoral Researcher. GEOMAR Helmholtz Centre for Ocean Research Kiel

Theme: *Nitrous oxide production and emissions in the Atlantic and Pacific oceans*

Honours

- 2023** American Geophysical Union (AGU) Outstanding Reviewer Award 2022, USA
2017 Annette Barthelt Award for Marine Research, Kiel, Germany
2016 Petersen Prize for outstanding PhD thesis, Kiel, Germany
2009 COLFUTURO-DAAD Scholarship for Master studies in Germany
2002 Excellence Scholarship Universidad Jorge Tadeo Lozano for Bachelor studies, Colombia

Grants

- 2022–2024** Marie Curie Fellowship: "*Dynamics of nitrous oxide release to the atmosphere under coastal hypoxia*". Main proponent. Amount: 200kEUR. Funding: European Union
2021–2025 Exchange fluxes of climate-relevant trace gases off the Western Antarctic Peninsula (EWARP). Co-proponent. Amount: 35kEUR. Funding: German Science Foundation, Germany
2021–2023 Ship time grant on board R/V Polarstern: "*Greenhouse gas fluxes at ocean-sea ice-air interfaces in the Arctic Ocean (FLUX-ON-SITE)*" Main proponent. Funding: German Science Foundation, Germany
2021–2024 Ship time grant on board R/V MSM Merian: "*Polar physical and biogeochemical Arctic and Southern Ocean Teleconnections (POLAR BEAST)*". Co-proponent. Amount: 59kEUR. Funding: German Science Foundation, Germany
2021–2023 Regular FONDECYT National Projects Competition: "*The role of plankton dynamics in air-sea fluxes of climate-relevant trace gases and atmospheric conditions in the Northern Antarctic Peninsula*". Co-proponent. Amount: 40kEUR. Funding: FONDECYT, Chile
2019–2021 EU ARICE-Call 2019: "*Trace gases (N₂O, CO) cycling in the Arctic marine ecosystem*". Main proponent. Amount: 20kEUR. Funding: Arctic Icebreaker Research Consortium, European Union
2016–2017 Future Ocean Mini Proposal CP16: "*On the trail of the missing carbon monoxide from the Ocean: first global maps*". Main proponent. Amount: 55kEUR. Funding: Cluster of Excellence "The Future Ocean", Germany
2016–2017 Technology Seed Funding: "*Development of a fast, autonomous measurement package for dissolved and atmospheric trace gas measurements at sea*". Main proponent. Amount: 8kEUR. Funding: GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany

Oceanographic expeditions

I participated in 13 major research cruises over the last 12 years spanning the Pacific, Atlantic and Arctic oceans, as well as several short-term surveys on smaller research vessels in coastal northern European waters. I also conducted biogeochemical sampling during two Atlantic crossings (Liverpool-UK to Halifax-Canada) on board M/V Atlantic Companion, a Swedish Ship of Opportunity. In total, I spent over 450 days at sea.

- 09/2023** R/V Navicula N2315 (Lake Grevelingen, Netherlands)
04/2023 R/V Meteor M189 (Southeast Atlantic) **Group leader**
03/2023 R/V Navicula N2302 (Lake Grevelingen and Veerse Meer, Netherlands)
07/2018 R/V Polarstern PS114 (Fram Strait, East Greenland) **Group leader**
05/2018 R/V Meteor M148 (Tropical Atlantic, Southeast Atlantic) **Group leader**
01/2018 R/V Poseidon POS519 (Eastern Tropical North Atlantic) **Co-chief scientist**
06/2017 R/V Meteor M138 (Southeast Pacific)
10/2016 R/V Elisabeth Mann Borgese EMB142 (Baltic Sea) **Group leader**
10/2015 R/V Sonne SO243 (Southeast Pacific)
07/2013 R/V Meteor M98 (Tropical Atlantic) **Group leader**

02/2013 R/V Meteor M93 (Southeast Pacific) **Group leader**
12/2012 R/V Meteor M91 (Southeast Pacific)
11/2012 R/V Meteor M90 (Southeast Pacific) **Group leader**
05/2011 R/V Maria S. Merian MSM18/2 (Equatorial Atlantic)

Additionally, I had the role of principal investigator in 15 expeditions in which I was not on board. The data sets from 4 expeditions (2013–2014) resulted in peer-reviewed publications, 4 led to successful master (3) and bachelor theses (1) which are part of manuscripts currently in preparation, and the remaining 7 are being evaluated as part of master theses co-supervised by me.

05–06/2023 R/V Polarstern PS136 (Fram Strait)
04–06/2023 R/V Sonne SO-298 (Equatorial Pacific)
01–02/2023 R/V Meteor M187 (Southeast Atlantic)
04–05/2022 R/V Meteor M181 (Southeast and equatorial Atlantic)
02–04/2022 R/V Sonne SO-289 (South Pacific Ocean)
12–01/2022 R/V Sonne SO-287 (Tropical Atlantic and Pacific)
07–09/2021 IB Oden SAS-2021 (Central Arctic Ocean)
06–08/2021 R/V Sonne SO-284 (Tropical Atlantic)
09–10/2019 R/V Meteor M158 (Southeast and equatorial Atlantic)
07/2019 R/V MSM Merian MSM85 (East Greenland shelf)
03–05/2019 R/V Akademik Tryoshnikov AT19 (Barents Sea / Franz-Joseph-Land)
07–08/2014 R/V Sonne SO235 (Southwestern Indian Ocean)
07/2014 R/V Sonne SO234/2 (Southwestern Indian Ocean)
07–10/2013 R/V Meteor M100/1 (South Atlantic, Southern Indian Ocean)
07–08/2013 R/V Meteor M99 (Southeast Atlantic)

Expert assignments

2023– Member of the the Pool of Experts (PoE) of the United Nations Regular Process for Global Reporting and Assessment of the State of the Marine Environment

2023 Member of the lead author team for the German Climate Observing Systems - Inventory report on the Global Climate Observing System (GCOS)

2022– Member of the SOLAS Implementation Team for theme 1 "Greenhouse gases and Oceans"

2021– Member of the strategy group on sustainable open ocean observations from the German Marine Research Consortium (KDM)

2020– Lead author of the Standard Operation Procedure (SOP) on underway measurements of CH₄ and N₂O (available under: <https://web.whoi.edu/methane-workshop/sops/>)

2018– Member of team of guiding experts for revision of Essential Ocean Variables within the Deep Ocean Observing Strategy

Projects with International Cooperation

Through my participation in international projects I have been able to create a large network of collaborators including researchers based in North and South America, Europe, western Africa, New Zealand and China. The joint work has resulted in several peer-reviewed manuscripts

with significant contributions to the field of biogeochemistry of climate-relevant trace gases (see attached list of publications).

2021–2025 Exchange fluxes of climate-relevant trace gases off the Western Antarctic Peninsula (EWARP). Funding: German Science Foundation, Germany

2021–2023 The role of plankton dynamics in air-sea fluxes of climate-relevant trace gases and atmospheric conditions in the Northern Antarctic Peninsula Funding: FONDECYT. Cooperation with Pontificia Universidad Católica de Valparaiso (Chile)

2019–2023 Pathways and emissions of climate-relevant trace gases in a changing Arctic ocean. Funding: German Ministry of Education and Research and Natural Environment Research Council (UK)

2018– Greenland Circumnavigation Expedition. Funding: Swiss Polar Institute

2018 Integrated carbon and trace gas monitoring for the Baltic Sea (BONUS INTEGRAL). Funding: European Union

2017 Effects of ocean acidification on the emission and production pathways of nitrous oxide in the Southern Ocean). Funding: German Ministry of Education and Research. Cooperation with Third Institute of Oceanography in Xiamen (China)

2014–2017 SCOR Working Group 143: "Dissolved N₂O and CH₄ measurements: Working towards a global network of ocean time series measurements of N₂O and CH₄". Funding: SCOR

2012–2019 Collaborative Research Center SFB754 "Climate-Biogeochemistry Interactions in the Tropical Ocean". Funding: German Research Foundation

2012–2015 FP7 Integrated non-CO₂ Greenhouse gas Observing System (InGOS). Funding: European Union

2011–2015 Surface Ocean Processes in the Anthropocene. Funding: German Ministry of Education and Research

Bibliometric information

Web of Science: 29 peer-reviewed publications, 621 citations, h-index 13 (January 2025)

Google Scholar: 30 peer-reviewed publications, 900 citations, h-index 15 (January 2025)

Reviewer activities

Journals: AGU Earth's Future, Biogeosciences, Communications Earth & Environment, Elementa: Science of the Anthropocene, Environmental Advances, Environmental Science & Technology, Estuarine, Coastal and Shelf Science, Environmental Science and Pollution Research, Frontiers in Marine Science, Geosciences, Geophysical Research Letters, Global Biogeochemical Cycles, Journal of Geophysical Research (JGR) Oceans, JGR Biogeosciences, Journal of Marine Systems, Limnology and Oceanography, Limnology and Oceanography letters, Marine Pollution Bulletin, Nature Communications, Nature Food, Ocean Science, Progress in Oceanography, Science, Scientific reports

Book chapters: Springer Handbook of Atmospheric Measurements

Funding agencies: European Research Council, European Commission, National Science Foundation (USA), Leverhulme Trust (UK)

Editorial services

2024– Editorial board member Ocean Science (Copernicus Publications)

2024– Editorial board member Discover Oceans (Nature Springer Group)

2021 Guest editor for special issue "Changing Arctic Ocean", *Ambio – A Journal of Environment and Society*.

Additional training

- 2021** Online-Seminar: University Didactics "Starter", Kiel University, Germany
2020 Helmholtz Advance Mentoring Program, Berlin, Germany

Teaching activities

- 2024** Personal and Professional Development, BSc. program in biology, Radboud University, The Netherlands
2021 Air-Sea Exchange and the Sea Surface Microlayer (Guest Lecturer), MSc. programs in biological oceanography and climate physics, Kiel University, Germany

Student supervision

I co-supervised bachelor and master students at Kiel University (Germany), and acted as advisor for 3 PhD students at Kiel University. Currently I supervise master students at Radboud University and Utrecht University (Netherlands), the Oceanography program at Pontificia Universidad Católica de Valparaíso (Chile), and Climate Physics program at Kiel University. Furthermore, currently I act as advisor of a PhD student at Oldenburg University (Germany).

- 2024** Doctoral thesis Hanna Campen. Role: Advisor
Topic: "Dimethylsulfide and Carbon Monoxide cycling in the Arctic Ocean"
2024 Master thesis Kassandra Kakkarou. Role: Co-supervisor
Topic: "Non-CO₂ greenhouse gas dynamics in the equatorial Atlantic"
2024 Master thesis Archana Sebastian. Role: Co-supervisor
Topic: "CH₄ and N₂O dynamics in the Fram Strait (Arctic Ocean)"
2024 Master thesis Sarah Schrammeck. Role: Co-supervisor
Topic: "Nitrous oxide dynamics on Lake Grevelingen, The Netherlands"
2024 Master thesis Javier Babbonney Valenzuela. Role: Co-supervisor
Topic: "Variability of DMSP and DMSO in Maxwell Bay (Antarctic Peninsula)"
2023— Doctoral thesis Lina Holthusen. Role: Advisor
Topic: "Exchange fluxes of trace gases in the western Antarctic Peninsula"
2022 Bachelor thesis Marei Pohlmann. Role: Co-supervisor
Topic: "Nitrous oxide variability in the equatorial Pacific"
2023 Doctoral thesis Guanlin Li. Role: Advisor
Topic: "Carbon monoxide in coastal waters and the open ocean"
2022 Master thesis Inga Brockmann. Role: Co-supervisor
Topic: "N₂O cycling in the western tropical Atlantic"
2022 Master thesis David Taiwo Aina. Role: Co-supervisor
Topic: "Nitrous emissions from the Southern Ocean"
2022 Master thesis Lina Holthusen. Role: Co-supervisor
Topic: "Methane dynamics off Franz-Joseph Land, Arctic Ocean"
2021 Master thesis Isabell Schlangen. Role: Co-supervisor
Topic: "Nitrous oxide cycling in the equatorial Atlantic"
2021 Master thesis Daniel Bastian. Role: Co-supervisor
Topic: "Distribution and pathways of methane on the East Greenland Shelf"
2019 Master thesis Julia Raab. Role: Co-supervisor
Topic: "N₂O-cycling in the eastern South Atlantic"
2018 Semester thesis Sonja Gindorf. Role: Co-supervisor
Topic: "Discrete vs. autonomously measured N₂O in the subpolar North Atlantic"
2017 Bachelor thesis Lina Holthusen. Role: Co-supervisor

Topic: "N₂O along 86°W in the tropical South Pacific" [in German]

2014 Doctoral thesis Xiao Ma. Role: Advisor

Topic: "Coastal and open ocean variability of N₂O and CH₄"