Raúl R. Cordero

Department of Physics, University of Santiago de Chile
Ave. Bernardo O'Higgins 3363, Santiago, Chile

Academic Degrees

2012, Doktor der Naturwissenschaften (Climatology), Leibniz Universität Hannover, Germany

2004, Doctor in Engineering Sciences (Applied Optics), Universidad Católica de Chile, Chile

2000, Master of Sciences (Renewable Energy), Universidad Técnica Federico Santa María, Chile

1995, Mechanical Engineer, Escuela Superior Politécnica del Litoral, Ecuador

Relevant Experience

Since 2008, Associate Professor, Department of Physics, Universidad de Santiago de Chile, Chile

2006-2008, Visiting Researcher, Leibniz Universität Hannover, Germany

2000-2006, Lecturer, Department of Physics, Universidad Técnica Federico Santa María, Chile

Fields of Interest

Climate, Atmospheric sciences, Renewables

Languages

Spanish, English, German

Relevant Memberships

Since 2024, Co-author/member of the UNEP Environmental Effects Assessment Panel (EEAP), which provides regular scientific assessments to the Parties of the Montreal Protocol on the environmental effects of stratospheric ozone depletion and its interaction with climate change.

Since 2024, Member of the Chilean Scientific Committee on Climate Change, which provides Chilean policymakers with scientific advice on climate change, its implications, potential future risks, and adaptation and mitigation options.

2024-2025, Member of the assessment committee of the Veni 2024 round in the Dutch Research Council (NWO) Talent Programme. The assessment committee advises NWO's Domain Board Science regarding grant awards.

Since 2021, Member of the International Ozone Commission (IO3C), one of the special commissions of the International Union of Geodesy and Geophysics. IO3C helps to organize the study of ozone around the world.

Since 2020 Chilean delegate to the Geosciences Group of the Scientific Committee on Antarctic Research (SCAR), which provides scientific advice to Antarctic Treaty Consultative Meetings and information to the Intergovernmental Panel on Climate Change (IPCC).

Since 2018, Member of the Programme Planning Group for developing a Scientific Research Programme (SRP), of the Scientific Committee on Antarctic Research (SCAR), entitled Near-term Variability and Prediction of the Antarctic Climate System (AntClim^{Now}).

Since 2018, Member of the Action Group on Antarctic Clouds and Aerosols (ACA) of the Scientific Committee on Antarctic Research (SCAR).

Since 2017, Member of the Steering Committee of the Network for the Detection of Atmospheric Composition Change (NDACC) endorsed by the United Nations Environment Program (UNEP).

Since 2016, Member of the Scientific Advisory Group (SAG) on Ozone & UV Radiation; Global Atmosphere Watch (GAW), a program of the World Meteorological Organization (WMO).

Since 2014, Member of the Chilean Scientific Committee on Antarctic Research (CNIA by its Spanish acronym).

2014-2020 Chilean delegate to the Physical Sciences Scientific Group (PSG) of the Scientific Committee on Antarctic Research (SCAR), which provides scientific advice to Antarctic Treaty Consultative Meetings and information to the Intergovernmental Panel on Climate Change (IPCC).

2016-2019, Member of the Standing Committee for Earth Sciences of the Chilean Fund for Science and Technology (FONDECYT/CONICYT, by its Spanish acronym).

Projects

Research Projects

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1231904 "CASCADE: Cascading Climate Extremes in the Northern Antarctic Peninsula" 2023-2027 (Principal investigator)

ANID (Chile) Agencia Nacional de Investigación y Desarrollo, National Tender Process for Team Research Projects (Anillos) in Science and Technology, Preis ACT210046 "Compound and cascading climate extremes in Chile" 2022-2025 (Project Director)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1221122 "Characterization of winter low- and middle-cloud properties linked to atmospheric changes in King George Island, Antarctic Peninsula (CONMAGIA)" 2022-2025 (Co-investigator)

INACH (Chile) Instituto Antárctico Chileno, Preis RT_69-20 "Assessment of the sensitivity of ice shelves to the enhanced weather variability", 2021-2024 (Co-investigator)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1211338 "The role of plankton dynamics in air-sea fluxes of climate- relevant trace gases and atmospheric conditions in the Northern Antarctic Peninsula" 2021-2024 (Co-investigator)

CORFO (Chile) Corporación de Fomento de la Producción, Preis 19BP-117358 "Development of a Heat/Health Warning System (HHWS) for Chile" 2020-2023 (Principal investigator)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1191932 "PROMESA: AtmosPheric RadiatiOn MeasurEments on King George Island (Southern Ocean / Antarctic Peninsula)" 2019-2023 (Principal investigator)

INACH (Chile) Instituto Antárctico Chileno, Preis RT_70-18 "Light-absorbing impurities on coastal snowpacks in the Antarctic Peninsula", 2019-2022 (Principal investigator)

CORFO (Chile) Corporación de Fomento de la Producción, Preis 18BPE-93920 "Direct Solar Irradiance (DNI) in the Atacama Desert" 2019-2022 (Principal investigator)

CORFO (Chile) Corporación de Fomento de la Producción, Preis 18BPCR-89100 "Soiling on mirrors for CSP technologies under the Atacama conditions" 2019-2021 (Principal investigator)

CORFO (Chile) Corporación de Fomento de la Producción, Preis 17BPE-73748 "Reflectivity of Atacama Desert and its effect on the Bifacial Solar Modules" 2018-2020 (Principal investigator)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1171690 "Southern Hemisphere Climate System Response to Stratospheric Ozone Depletion" 2017-2020 (Co-investigator)

CORFO (Chile) Corporación de Fomento de la Producción, Preis 16BPE2-66227 "Ensuring the Quality of Radiometric and Photometric Measurements in Chile" 2017-2019 (Principal investigator)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1161460 "Characterization of Low Clouds over the Antarctic Peninsula and the West Antarctic Ice Sheet (WAIS)" 2016-2019 (Co-investigator)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología, National Tender Process for Team Research Projects (Anillos) in Science and Technology, Preis ACT1410 "Black Carbon in the Andean Cryosphere" 2016-2019 (Project Director)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1151034 "Reflectivity of Antarctica" 2015-2019 (Principal investigator)

INACH (Chile) Instituto Antárctico Chileno, Preis RT_32-15 "Spectral Radiance in the Antarctic Peninsula", 2016-2019 (Principal investigator)

FONDEQUIP (Chile) Consejo Nacional de Ciencia y Tecnología, Preis EQM150050 "Characterization of Clouds in the Antarctic Peninsula and the Southern Ocean", 2016-2017 (Principal investigator)

FONDEF (Chile) Consejo Nacional de Ciencia y Tecnología, Preis ID15I10623 "Development of sensors for surface and UAV-born monitoring of albedo", 2016-2018 (Co-investigator)

CORFO (Chile) Corporación de Fomento de la Producción, Preis 15BPE-47233 "Short wave solar spectrum in Northern Chile" 2015-2017 (Co-investigator)

CORFO (Chile) Corporación de Fomento de la Producción, Preis 15BP-45364 "Soiling effect on PV modules in Northern Chile" 2015-2017 (Principal investigator)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1140239 "Influence of the solar activity on the polar environment" 2014-2017 (Co-investigator)

FONDECYT POSTDOC (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 3150229 "Ozone variability influence on the coupled atmosphere-ocean system" 2014-2017 (Sponsor)

CORFO (Chile) Corporación de Fomento de la Producción, Preis 14BPC4-28651 "UV-related degradation of PV technologies under the extreme conditions in Northern Chile" 2014-2016 (Principal investigator)

FONDEF (Chile) Consejo Nacional de Ciencia y Tecnología, Preis IT13I10034 "National Standards for Shortwave radiation and for UV doses", 2014-2016 (Principal investigator)

FONDEQUIP (Chile) Consejo Nacional de Ciencia y Tecnología, Preis EQM130027 "Multichannel Spectroradiometer for Ozone and UV monitoring in Antarctica", 2013-2014 (Principal investigator)

FONDECYT POSTDOC (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 3140076 "Improved-Accuracy Digital Holographic System" 2013-2016 (Sponsor)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1120639 "Development of a UV Reconstruction Model" 2012-2015 (Principal investigator)

CONACYT (México) Consejo Nacional de Ciencia y Tecnología, Preis 180654 "Investigación e Implementación de Técnicas Ópticas en la evaluación de Propiedades Mecánicas de Materiales" 2012-2015 (Co-investigator)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología, National Tender Process for Team Research Projects (Anillos) in Science and Technology, Preis ACT98 "Surface Spectral UV Radiation and UV-Linked Effects on Endemic Species" 2010-2013 (Project Director)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología, National Tender Process for Team Research Projects (Anillos) in Science and Technology, Preis ACT95 "Nano and Micromechanics of Soft Matter systems" 2010-2013 (Associate researcher)

FONDECYT POSTDOC (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 3110159 "On Climate change-related effects on surface UV radiation in Antarctica: development of a Ground-based UV Reconstruction Model" 2010-2013 (Sponsor)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 1090471 "Two-Term Integrity Assessment Methodologies: Studying the Out-Of-Plane Constraint Loss and Comparing Outcomes With Whole-Field Interferometric Measurements" 2009-2012 (Co-investigator)

FONDECYT (Chile) Consejo Nacional de Ciencia y Tecnología, Preis 11080072 "Setting up a portable double monochromator-based spectroradiometer system for ground-based solar UV radiation measurements" 2010-2012 (Principal investigator)

FONDAP (Chile) Preis 11980002 "Centro de Investigacion Interdisciplinaria Avanzada en Ciencias de los Materiales (CIMAT)" 2009-2010 (Associate Researcher)

CONACYT (México) Consejo Nacional de Ciencia y Tecnología, Preis 48286-F "Interferometría de moteado para contorneo y análisis optico 3D" 2007-2009 (Co-investigator)

SCOUT-O3 (European Community) Stratosphere-Climate Links with Emphasis on the UTLS (Comp. 4: UV Radiation)", "2006-2009 (Associate scientist)

CONCYTEG (México) Consejo de Ciencia y Tecnología del Estado de Guanajuato, Preis 05-04-K117-037 "Interferometría de moteado para análisis optico" 2005-2006 (Co-investigator)

CONCYTEG (México) Consejo de Ciencia y Tecnología Estado de Guanajuato, Preis 04-04-K117-011 "Medición de deformación 3D por Interferometría de moiré y de moteado" 2004-2005 (Co-investigator)

International collaboration

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología – DFG (Germany) Deutsche Forschungsgemeinschaft. "Chilean contribution to SouthTrac, Preis DFG190004" 2020-2021 (Main researcher)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología – Institut Fuer Meteorologie und Klimatologie (Universitaet Hannover, Germany) Preis REDES180158 "Association with the University of Hannover (Germany)" 2019-2021 (Main researcher)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología - BMBF (Germany) Bundesministerium für Bildung und Forschung, Preis PCCI20130041 "Downwelling and Upwelling Radiance", 2014-2016 (Main researcher)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología – Institut Fuer Meteorologie und Klimatologie (Universitaet Hannover, Germany) Preis REDES130047 "Association with the University of Hannover (Germany)" 2013-2014 (Main researcher)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología - BMBF (Germany) Bundesministerium für Bildung und Forschung, Preis 236-2010 "Solare Strahlung auf der antarktischen Halbinsel: Abschätzung der Auswirkungen von Wolken und Albedo", 2011-2013 (Main researcher)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología - DAAD (Germany) Deutscher Akademischer Austausch Dienst, Preis 257-2010 "Solare Strahldichte auf der antarktischen Halbinsel", 2011-2013 (Main researcher)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología - CONACYT (Mexico) Consejo Nacional de Ciencia Y Tecnología, Preis 2009–090 "Analisis de los Mecanismos de Deformacion de Cuticulas de Frutas Mediante Tecnicas de Interferometria Laser", 2010-2012 (Main researcher)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología - BMBF (Germany) Bundesministerium für Bildung und Forschung, Preis 2008–096 "Setting up a high quality portable spectroradiometer system for solar UV radiation", 2009-2011 (Main researcher)

CONICYT (Chile) Consejo Nacional de Ciencia y Tecnología - DAAD (Germany) Deutscher Akademischer Austausch Dienst, Preis 2008–142 "Messung der spektralen Bestrahlungsstärke im UV Bereich: Abschätzung von hemisphärische Unterschiede" , 2009-2011 (Main researcher)

University-funded Research Projects

USACH (Chile) Universidad de Santiago de Chile, Proyecto DICYT ASOCIATIVO Preis 041331CC_DAS "Effect of the Antarctic Albedo on the Surface UV" 2014-2017 (Main Researcher)

USACH (Chile) Universidad de Santiago de Chile, Proyecto de Gestión Tecnológica Preis 041031-cc, "Testing the potential of compounds as effective cuticular antitranspirants'' 2010 (Main Researcher)

USACH (Chile) Universidad de Santiago de Chile, Proyecto de Gestión Tecnológica Preis 4091465, "Setting up traceability-ensured calibration standards for UV, visible and near infrared radiation'' 2009 (Main Researcher)

USACH (Chile) Universidad de Santiago de Chile, Proyecto DICYT Preis 04-0831C "Setting up a high quality spectroradiometer systems for measuring solar UV radiation" 2008-2009 (Main researcher)

UTFSM (Chile) Universidad Técnica Federico Santa María "Numerical study of the strain behaviour of metallic specimens subjected to mechanical tests" 2006-2008 (Associate Researcher)

Projects on Education

USACH (Chile) Universidad de Santiago de Chile, Proyecto de Proyectos de Mejoramiento de Postgrado "Nuevo Programa de Doctorado en Ciencias de la Sustentabilidad'' 2016 (Main Researcher)

USACH (Chile) Universidad de Santiago de Chile, Proyecto de Innovacion Docente, "Diseño y producción de material multimedia y herramientas audiovisuales para apoyar la enseñaza de la Óptica en cursos de Ingeniería'' 2011 (Main Researcher)

USACH (Chile) Universidad de Santiago de Chile, Proyecto de Innovacion Docente, "Puesta en marcha del Proceso de Mejora Continua de los cursos de laboratorio contemplados en el Plan de Estudio de la Licenciatura En Educación de Física y Matemática'' 2010 (Main Researcher)

USACH (Chile) Universidad de Santiago de Chile, Proyecto de Innovacion Docente, "Aplicación del Método Indagatorio en la enseñanza de la Óptica en cursos de Ingeniería Física'' 2009 (Main Researcher)

Peer-reviewed publications

1. Legrain E., Tollenaar V., Goderis S., Ardoin L., Blard P-H., Claeys P., Cordero R.R., et al. "Absence of Elevation-Dependent Warming in Antarctica inferred from Blue Ice Paleoclimate Records". Geophysical Research Letters, Accepted (2025).

2. Gonzalez-Santacruz N., Fernandoy F., Goto-Azuma K., Cordero R., Feron S., Farias, S., "Black carbon effects and seasonal isotope records in the Godwin-Austen snowpack and K2 high-altitude camps". *Journal of Glaciology.* Accepted. (2025).

3. Neale P.J., Cordero R.R. et al., "Environmental consequences of interacting effects of changes in stratospheric ozone, ultraviolet radiation, and climate: UNEP Environmental Effects Assessment Panel, Update 2024". *Photochemical & Photobiological Sciences* https://doi.org/10.1007/s43630-025-00687-x (2025).

4. Damiani, A., Ishizaki, N.N., Sasaki, H., Feron S., Cordero R. R. "Projecting future snow changes at kilometer scale for adaptation using machine learning and a CMIP6 multi-model ensemble". *Science of the Total Environment*, **964**, 178606 (2025).

5. Bernhard, G. H., Janson, G. T., Simpson, S., Cordero, R. R., Sepúlveda Araya, E. I., Jorquera, J., Rayas, J.A. & Lind, R. N. "Does total column ozone change during a solar eclipse?" *Atmospheric Chemistry and Physics (ACP),* **25**, 819–841. (2025).

6. Kolbe, M., Bintanja, R., van der Linden, E. C., & Cordero, R. R. "Vertical Structure and Surface Impact of Atmospheric Rivers reaching Antarctic sea ice and land". *Atmospheric Research*, **315**, 107841 (2025)

7. Cordero R.R., Feron S., Damiani A., "Global South Researchers need to focus on Losses and Damages", *Nature Sustainability*, 1-2, https://doi.org/10.1038/s41893-024-01499-0 (2024)

8. Wang C., Deng C., Horsey H., Reyna J., Liu D., Feron S., Cordero R., Song J., and Jackson R., "CHUWD-H v1.0: a comprehensive historical hourly weather database for U.S. urban energy system modeling", *Scientific Data* **11**, 1383 (2024)

9. Cordero R.R., Feron S., Damiani A., MacDonell S., Carrasco J., Pizarro J., Karas C., Jorquera J., Sepulveda E., Cabello F., Fernandoy F., Wang C., Khan A., & Casassa, G. "Rapid decline in extratropical Andean snow cover driven by the poleward migration of the Southern Hemisphere westerlies", *Scientific Reports*, **14**, 26365 (2024)

10. Feron S., Cordero R.R., Damiani A., MacDonell S., Pizarro J., Goubanova K., Valenzuela R., Wang C., Rester L. Beaulieu A. "South America is becoming warmer, drier, and more flammable", *Communications Earth & Environment*, **5**, 501 (2024)

11. Bromwich, D. H., Gorodetskaya, I. V., Carpentier, S., Alexander, S., Bazile, E., Heinrich, V. J., Cordero R. R., & Zou, X. (2024). "Winter Targeted Observing Periods during the Year of Polar Prediction in the Southern Hemisphere (YOPP-SH)". *Bulletin of the American Meteorological Society (BAMS)*, https://doi.org/10.1175/BAMS-D-22-0249.1 (2024).

12. Bozkurt D., Carrasco J. F., Cordero R. R., Fernandoy F., Gomez A., Carrillo B., Guan B. "Atmospheric River Brings Warmth and Rainfall to the Northern Antarctic Peninsula During the Mid-Austral Winter of 2023". *Geophysical Research Letters*, **51**, e2024GL108391 (2024).

13. Damiani, A., Ishizaki, N.N., Sasaki, H., Feron S., Cordero R. "Exploring super-resolution spatial downscaling of several meteorological variables and potential applications for photovoltaic power". *Scientific Reports* **14**, 7254 (2024).

14. Domínguez-Flores A., Rayas J., Martinez A., Cordero R.R. "Analysis and Correction of the Additive Phase Effect Generated by Power Change in a Mach–Zehnder Interferometer Integrated to an Optical Trap". *Applied Sciences*, **14**, 2404 (2024).

15. Damiani A., Irie H., Belikov D., Cordero R., Feron S., Ishizaki N. N., "Air quality and urban climate improvements in the Greater Tokyo Area during the COVID-19 pandemic", *Environmental Research Letters* **19,** 034023 (2024).

16. Cordero, R. R., Feron, S., Damiani, A., Carrasco, J., Karas, C., Wang C., Kraamwinkel, C.T. & Beaulieu, A. "Extreme Fire Weather in Chile driven by Climate Change and El Niño–Southern Oscillation (ENSO)". *Scientific Reports*, **14**, 1974 (2024).

17. Feron S., Malhotra A., Bansal S., Fluet-Chouinard E., McNicol G., Knox S. H., Delwiche K. B., Cordero R.R., Ouyang Z., Zhang Z., Poulter B. Jackson R.B. Recent increases in annual, seasonal, and extreme methane fluxes driven by changes in climate and vegetation in boreal and temperate wetland ecosystems. *Global Change Biology*, **30**(1), e17131 (2024).

18. Gorodetskaya, I., Durán-Alarcón, C., Gonzalez-Herrero, S., Clem, K., Leroy-Dos Santos, C., Campos, D., Cordero R.R., et al. "Record-high Antarctic Peninsula temperatures and surface melt in February 2022: A compound event with an intense atmospheric river", *npj Climate and Atmospheric Science*, **6**, 202 (2023).

19. Cordero, R. R., Feron, S., Damiani, A., Llanillo, P. J., Carrasco, J., Khan, A. L., Bintanja, R., Ouyang Z., & Casassa, G. Signature of the stratosphere-troposphere coupling on recent record-breaking Antarctic sea ice anomalies. *The Cryosphere*, **17**, 4995–5006 (2023).

20. Zou, X., Rowe, P. M., Gorodetskaya, I., Bromwich, D. H., Lazzara, M., Cordero, R. R., & Bai, L. S. Strong Warming over the Antarctic Peninsula during Combined Atmospheric River and Foehn Events: Contribution of Shortwave Radiation and Turbulence. *Journal of Geophysical Research – Atmospheres* **128**(16), (2023).

21. Cordero R. R., Feron S., Damiani A., Sepúlveda E., Jorquera J., Redondas A., Seckmeyer G., Carrasco J., Rowe P., Ouyang Z. "Surface Solar Extremes in the Most Irradiated Region on Earth, Altiplano". *Bulletin of the American Meteorological Society (BAMS),* DOI 10.1175/BAMS-D-22-0215.1 (2023).

22. Cordero R. R., Feron S., Sepúlveda E., Damiani A., Jorquera J., Rowe P., Carrasco J., Rayas J., Llanilllo P., MacDonell S., Seckmeyer G. "Ground-based measurements of the weather-driven sky radiance distribution in the Southern Hemisphere". *Plos One*, **18**(6): e0286397 (2023).

23. Feron S., Cordero R. R., Damiani A., Oyola P., Ansari T., Pedemonte J.C., Wang C., Ouyang Z., Gallo V. "Compound Climate-Pollution Extremes in Santiago de Chile"**,** *Scientific Reports*, **13**:6726 (2023).

24. Damiani, A., Irie, H., Belikov, D., Kaizuka, S., Hoque, H. M. S., & Cordero, R. R. "Peculiar COVID-19 effects in the Greater Tokyo Area revealed by spatiotemporal variabilities of tropospheric gases and light-absorbing aerosols". *Atmospheric Chemistry and Physics*, **22**, 12705–12726 (2022).

25. Kinsey, G. S., Riedel-Lyngskær, N. C., Miguel, A. A., Boyd, M., Braga, M., Chunhui, S., Cordero R.R. et al. Impact of measured spectrum variation on solar photovoltaic efficiencies worldwide. *Renewable Energy* **196**, 995-1016 (2022).

26. Cordero R. R., Sepúlveda E., Feron S., Wang C., Damiani A., Fernandoy F., Neshyba S., Rowe P., Asencio V., Carrasco J., Alfonso J., MacDonell S., Seckmeyer G., Carrera J., Jorquera J., Llanilllo P., Dana J., Khan A., Casassa G. "Black carbon in the southern andean snowpack". *Environmental Research Letters* **17**, 044042 (2022).

27. Cordero R. R., Sepúlveda E., Feron S., Damiani A., Fernandoy F., Neshyba S., Rowe P., Asencio V., Carrasco J., Alfonso J., Llanillo P., Wachter P., Seckmeyer G., Stepanova M., Carrera J., Jorquera J., Wang C., Malhotra A., Dana J., Khan A., Casassa G. "Black Carbon Footprint of Human Presence in Antarctica". *Nature Communications* **13**(984), 1-11 (2022).

28. Cordero R. R., Feron S., Damiani A., Redondas A., Carrasco J., Sepúlveda E., Jorquera J., Fernandoy F., Llanillo P., Rowe P., Seckmeyer G., "Persistent Extreme Ultraviolet Irradiance in Antarctica despite the Ozone Recovery Onset". *Scientific Reports* **12**(1), 1-10 (2022).

29. Reyes A. K., Domínguez-Flores C. E., Rayas J. A., Monzón-Hernández D., Martínez-García A. & Cordero R. R. "Real-Time Temperature Monitoring in an Optical Trap". *IEEE Photonics Technology Letters*, **34**(2), 121-124 (2022).

30. Cordero R. R., Feron S., Sepúlveda E., Damiani A., Carrera J.M., Jorquera J., Alfonso J.A., Fuenzalida R., Rivas M., MacDonell S., Seckmeyer G., Wang C., Ouyang Z., Lhermitte S.

"Evaluation of MODIS-derived estimates of the albedo over the Atacama Desert using ground-based spectral measurements", *Scientific Reports*, **11**, 19822 (2021).

31. Feron S., Cordero R.R., Damiani A., Malhotra A., Seckemeyer, G., Llanillo P. "Warming Events projected to become more frequent and last longer across Antarctica", *Scientific Reports*, **11**:19564 (2021).

32. Pizarro, J., Vergara, P.M., Cerda, S., Cordero, R.R., Castillo, X., Rowe, P.M., Casassa, G., Carrasco, J., Damiani, A., Llanillo, P.J. and Lambert, F. "Contaminant emissions as indicators of chemical elements in the snow along a latitudinal gradient in southern Andes". *Scientific Reports*, **11**(1), pp.1-10 (2021).

33. Carrasco, J. F., Bozkurt, D., & Cordero, R. R. A review of the observed air temperature in the Antarctic Peninsula. Did the warming trend come back after the early 21st hiatus? *Polar Science*, 100653 (2021).

34. Sepulveda E., Cordero R.R., Damiani A., Feron S., et al., "Evaluation of Antarctic Ozone Profiles derived from OMPS-LP by using Balloon-borne Ozonesondes", *Scientific Reports*, **11**:4288 (2021)

35. Khan A. L., Dierssen H., Scambos T., Höfer J., R. R. Cordero, "Spectral Characterization, Radiative Forcing, and Pigment Content of Coastal Antarctic Snow Algae". *The Cryosphere* **15**(1), 133-148 (2021).

36. Feron S., Cordero R.R., Damiani A., Jackson R. "Climate-change extremes and photovoltaic power output", *Nature Sustainability* **4**(3), 270-276 (2021).

37. Carrasco J., Cordero R.R. "Analyzing Precipitation Changes in the Northern Tip of the Antarctic Peninsula during the 1970–2019 Period". *Atmosphere* **11**(12), 1270 (2020)

38. Bromwich D.H., Werner K., Casati B.; Powers J.B.; Gorodetskaya I.V.; Massonnet F.; Vitale V.; Heinrich V.J.; Liggett D.; Arndt S.; Bazile E.; Barja B.; Choi Y.; Colwell S.R.; Cordero R.R. et al., "The Year of Polar Prediction in the Southern Hemisphere (YOPP-SH)", *Bulletin of the American Meteorological Society (BAMS)*, **101**(10): E1653–E1676 (2020)

39. Damiani, A., Cordero, R.R., Llanillo, P.J., Feron, S., Boisier, J.P., Garreaud, R., Rondanelli, R., Irie, H. and Watanabe, S. "Connection between Antarctic ozone and climate: Interannual precipitation changes in the Southern Hemisphere". *Atmosphere*, **11**(6), p.579 (2020).

40. Cordero R.R., Asencio V., Feron S., Damiani A., Llanillo P., Sepulveda E., Jorquera J., Carrasco J., Casassa G., Dry-Season Snow Cover Losses in the Andes (18°-40°S) driven by Changes in Large-Scale Climate Modes, *Scientific Reports* **9**, 16945 (2019)

41. Llanillo P., Aiken C.M., Cordero R.R., Damiani A., Sepulveda E., Fernández-Gómez B., "Oceanographic Variability induced by Tides, the Intraseasonal Cycle and Warm Subsurface Water intrusions in Maxwell Bay, King George Island (West-Antarctica)". *Scientific Reports* **9**, 16945 (2019)

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Lectures (Undergraduate Courses)

Bases Físicas del Cambio Climático (The Physics of Climate Change), Department of Physics, Universidad de Santiago de Chile, Santiago, Chile

Introducción a la Sustentabilidad (Introduction to Sustainability), Faculty of Economics and Business Administration, Universidad de Santiago de Chile, Santiago, Chile

Regulaciones y Contaminación Ambiental (Environmental Regulations and Atmospheric Pollution), Universidad Técnica Federico Santa Maria, Valparaíso, Chile

Nivelación Física (Mechanics), Department of Physics, Universidad Técnica Federico Santa Maria, Santiago, Chile

Introducción a la Física (Mechanics), Department of Physics, Universidad Técnica Federico Santa Maria, Valparaíso, Chile

Física Básica I (Mechanics), Department of Physics, Universidad Técnica Federico Santa Maria, Valparaíso, Chile

Física Básica II (Electromagnetism and Thermodynamics), Department of Physics, Universidad Técnica Federico Santa Maria, Valparaíso, Chile

Física General I (Mechanics), Department of Physics, Universidad Técnica Federico Santa Maria, Valparaíso, Chile

Física General II (Electromagnetism), Department of Physics, Universidad Técnica Federico Santa Maria, Valparaíso, Chile

Física General III (Thermodynamics and Waves), Department of Physics, Universidad Técnica Federico Santa Maria, Valparaíso, Chile

Optica (Optics) Cod 25016, Department of Physics, Universidad de Santiago de Chile, Santiago, Chile

Laboratorio de Física de lo Cotidiano (Lab. Mechanics), Department of Physics, Universidad de Santiago de Chile, Santiago, Chile

Metrología Optica Cod. 25034 (Optical Metrology), Department of Physics, Universidad de Santiago de Chile, Santiago, Chile

Fisica de Frontera Cod. 23645 (Solar Radiation), Department of Physics, Universidad de Santiago de Chile, Santiago, Chile

Radiacion Solar (Solar Radiation), Department of Physics, Universidad de Santiago de Chile, Santiago, Chile

Introduction to Sustainable Energy Transition (100 level) CFBGR03505, BSc Global Responsibility & Leadership, Campus Fryslân, University of Groningen, The Netherlands

Climate Data and Services (300 level) CFBGR01905, BSc Global Responsibility & Leadership, Campus Fryslân, University of Groningen, The Netherlands

Academic Communication (CFBGR01005), BSc Global Responsibility & Leadership, Campus Fryslân, University of Groningen, Leeuwarden, The Netherlands

Data as Evidence (SOMINDW04), Data Wise Minor, Faculty of Behavioural and Social Sciences, University of Groningen, Groningen, The Netherlands

Introduction to Data (SOMINDW01), Data Wise Minor, Faculty of Behavioural and Social Sciences, University of Groningen, Groningen, The Netherlands

Urban Adaptation and Innovation (CFMCG08A05), Cultural Geography - Climate Adaptation Master Program, Campus Fryslân, University of Groningen, Groningen, The Netherlands

Climate Adaptation Governance (CFMCG03A05), Cultural Geography - Climate Adaptation Master Program, Campus Fryslân, University of Groningen, Groningen, The Netherlands

Statistics II (200 level) CFBGR01405, BSc Global Responsibility & Leadership, Campus Fryslân, University of Groningen, The Netherlands

Social Impact Assessment (CFMCG19A05), Cultural Geography - Climate Adaptation Master Program, Campus Fryslân, University of Groningen, Groningen, The Netherlands

Theses

1. "Improving Groundwater Governance in the Catalan River Basin District: Using and restoring aquifers to increase drought resilience", Paula Pérez-García, Finished 2024, BSc Global Responsibility & Leadership, Campus Fryslân, University of Groningen, The Netherlands, (Supervisor: R. Cordero).

2. "Enhancing the Resilience of Water Governance Practices in Southern Italy", Edoardo Ferrari, Finished 2024, BSc Global Responsibility & Leadership, Campus Fryslân, University of Groningen, The Netherlands, (Supervisor: R. Cordero).

3. "Indicators of a Sustainable Energy Transition: Application of the UK's Net Zero Growth Plan", Liyna Marguerie de Rotrou, Finished 2024, BSc Global Responsibility & Leadership, Campus Fryslân, University of Groningen, The Netherlands, (Supervisor: R. Cordero).

4. Characterization of the thermodynamic phase of clouds in Antarctica: "Caracterización de las fases de la termodinámica de las nubes en Antártica**"**, Fernanda Cabello, Finished 2023, Engineering in Applied Physics, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

5. Validation of OMPS-LP-derived Ozone Profiles by using Balloon-borne Ozonesondes: "Validación de derivados satelitales de perfiles atmosféricos de ozono en Antártica mediante uso de ozonosondas**"**, Edgardo Sepúlveda, Finished 2021, Engineering in Applied Physics, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

6. Soiling effect on photovoltaics: "Medición del efecto de la acumulación de polvo en paneles fotovoltaicos", María José Quiroga, Finished 2020, Engineering in Applied Physics, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

7. Bifacial modules in the Atacama Desert: "Estimación de generación eléctrica anual de módulo fotovoltaico bifacial en localidad de Diego de Almagro", Nicole Torres, Finished 2020, Engineering in Applied Physics, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

8. "Measurement of the morphology of isolate particles by using Interferometric techniques", Juan Rayas, Finished 2017, Doctor in Engineering Sciences (Material Science), Universidad de Santiago de Chile, (Supervisor: R. Cordero).

9. Optical Holography: "Aplicación de Holografía Digital para la recuperación de la topografía de cutículas vegetales", Natalia Salazar, Finished-2014, Engineering in Applied Physics, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

10. Ultraviolet Radiation effect on Polimers "Efectos de la Radiación UV en las propiedades Opticas de Biopolimeros", Mario Tobar, Finished-2014, Engineering in Applied Physics, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

11. New proposals for Teaching Ozone and Ultraviolet Radiation: "Propuesta de Enseñanza del Contenido de Ozono y Radiación UV para Tercer Año de Enseñanza Media", Gladys Osorio, Daniela Gaete y Patricia Romante, Finished-2014, Bachelor of Education, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

12. Ultraviolet Radiation effect on the biosphere: "Estudio del Efecto de la Radiación UV en la Permeabilidad de Hojas de Limón", Jorge Muñoz, Finished-2013, Engineering in Applied Physics, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

13. New proposals for Teaching Climate and Energy: "Desarrollo de Webquests asociadas a la problemática clima-energía", Gonzalo Guerrero, Ariel Moraga, Bárbara Pizarro, Finished-2012, Bachelor of Education, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

14. Reference spectroradiometer for ground-based measurements of the short wave spectrum: "Desarrollo de un Instrumento de Referencia para Mediciones Absolutas de Radiación de onda corta", Francisca Quiroz, Finished-2011, Engineering in Applied Physics, Universidad de Santiago de Chile, (Supervisor: R. Cordero).

Mentor for Postdocs

1. Dr. Thomas Loriaux, Ph.D., University of Bristol, United Kingdom. Postdoc at the Departamento de Física, Universidad de Santiago, Chile, 2021-2024

2. Dr. Susana Fernandez, Dr. rer. nat., University of Bern, Switzerland. Postdoc at the Departamento de Física, Universidad de Santiago, Chile, 2017-2018

3. Dr. Pedro Llanillo, Doctorat en Ciencies del Mar, Universitat Politecnica de Catalunya, Postdoc at the Departamento de Física, Universidad de Santiago de Chile, Chile, 2015-2019

4. Dr. Penny Rowe, Ph.D., Physical Chemistry, University of Washington, USA. Postdoc at the Departamento de Física, Universidad de Santiago, Chile, 2014-2016

5. Dr. Miguel León, Doctor en Optica, Centro de Investigaciones en Optica, Mexico. Postdoc at the Departamento de Física, Universidad de Santiago, Chile, 2014-2017

6. Dr. Alessandro Damiani, Doctor in Polar Sciences, Department of Earth Sciences of the University of Siena, Italy. Postdoc at the Universidad de Santiago, Chile, 2010-2013.