BIRTH
Rio de Janeiro, Brazil

NATIONALITIES
Brazilian 🇧🇷
Portuguese 🇵🇹

LANGUAGES
Portuguese (Native) 🇵🇹
English 🇬🇧
Italian 🇮🇹

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Bologna, Italy

CONTACT
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SCIENTIFIC PROFILES

SOCIAL PROFILES

LEONARDO ARAGÃO

CLIMATE SCIENTIST
Tracking cyclones to understand severe weather

PROFILE

A meteorologist who seeks a deeper understanding of the impacts of cyclonic activities on climate variability and its potential to trigger environmental disasters and hazards such as floods, landslides, windstorms, storm surges, etc. With years of experience in various European research projects and teaching tasks across diverse areas of meteorology, activities such as atmospheric modelling, and processing, treatment, quality control and analysis of meteorological and climatological data were always in his daily routine. His excellent computational skills allow him to produce and explore miscellaneous climate data types, from small to large scales, in small or large dimensions, and using different computational languages. This, together with his comprehensive background in meteorology and expertise in data exploration and visualisation, fosters the development of specific models and methods for identifying and analysing extreme events and severe weather. His current research focuses on developing and improving climate downscaling products for seasonal forecasts by leveraging machine learning techniques.

KEYWORDS   Cyclones, Climatology, Extreme Events, Severe Weather, Climate Downscaling, Machine Learning, Weather Forecast, WRF, Atmospheric Modelling, Reanalysis Data, Data Analysis, Data Visualisation, Teaching.

EXPERIENCE

EURO-MEDITERRANEAN CENTRE ON CLIMATE CHANGE, ITALY
POST-DOCTORAL RESEARCHER // Since **2023**

Since NOV**2023**	Statistical downscaling of ensemble forecasts applying machine learning and AI methodologies.
Project SPOKE 4 EARTH & CLIMATE cmcc-spoke.info	COORDINATION SILVIO **GUALDI**

UNIVERSITY OF BOLOGNA, ITALY
RESEARCH FELLOW // Since **2019**

JUL**2023** // DEC**2023**	Climatology of precipitation from cyclonic activities over the South China Sea and related extreme events.
Project INDRA indra-project.info	COORDINATION FEDERICO **PORCÙ**
JAN**2021** // JUN**2023**	Evaluation of WRF for a climatological down-scaling and computation of climate indicators for the Adriatic Sea.
Project AdriaCLIM italy-croatia.eu/adriaclim	COORDINATION NADIA **PINARDI** & SILVANA **DI SABATINO**
SINCE NOV**2020**	Volunteer position in a COST Action research project about cyclonic activities over the Mediterranean Sea.
Project MedCyclones medcyclones.eu/	COORDINATION EMMANOUIL **FLAOUNAS**
JAN**2019** // DEC**2020**	Extreme weather events at a climatological scale of several hydrological hazards.
Project OPERANDUM operandum-project.eu	COORDINATION FEDERICO **PORCÙ** & SILVANA **DI SABATINO**

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FEDERAL UNIVERSITY OF RIO DE JANEIRO, BRAZIL
LECTURER // **2017** to **2018**

MAR**2017** // DEC**2018**

Department of Meteorology

COURSES
Introduction to Atmospheric Sciences (60h), *Chemistry and Physics of Atmosphere* (60h), *Micrometeorology* (60h), *Fundamentals of Boundary Layer* (60h), and *General Topics of Geosciences* (20h).

EDUCATION

DOCTOR OF SCIENCE // OCT**2012** to MAY**2018**
FEDERAL UNIVERSITY OF RIO DE JANEIRO (UFRJ), BRAZIL
UNIVERSITY OF BOLOGNA (UNIBO), ITALY

THESIS — *Analysis of the Internal Boundary Layer formation over tropical coastal regions using acoustic sounding data and the atmospheric model WRF.*

ADVISORS — F.P. Duda, L.C.G. Pimentel, and Silvana Di Sabatino (international exchange).
GRANTEE — CAPES, Brazil (*Doctoral Scholarship*) and PDSE/CAPES, Brazil (*International Exchange*)
KEYWORDS — Internal Boundary Layer, Atmospheric Boundary Layer, Sea/Land Breeze, SODAR, WRF.

MASTER OF SCIENCE // MAR**2010** to JUN**2012**
FEDERAL UNIVERSITY OF RIO DE JANEIRO (UFRJ), BRAZIL
NATIONAL NUCLEAR ENERGY COMMISSION (CNEN), BRAZIL

THESIS — *Analytical solution of advection-diffusion-deposition transport equation using the General Integral Transform Technique.*

ADVISORS — F.P. Duda, and J.S. Pérez Guerrero.
GRANTEE — CAPES, Brazil (*Master Scholarship*).
KEYWORDS — Air Quality, Air Pollution Modeling, Dry Deposition, Transport Equation, Analytical Solution, GITT.

BACHELOR OF METEOROLOGY // MAR**2004** to JUN**2010**
FEDERAL UNIVERSITY OF RIO DE JANEIRO (UFRJ), BRAZIL

THESIS — *Simplified computational modelling of the kinetics formation of tropospheric ozone.*

ADVISOR — L.C.G. Pimentel
GRANTEE — CNPq/PIBIC, Brazil (*Scientific Initiation Scholarship*) and Department of Meteorology (UFRJ), Brazil (*Teaching Tutor Scholarship*).
KEYWORDS — Ozone, Alternative Fuels, Air Quality, Air Pollution Modeling, Atmospheric Chemistry, EDO.

LAST SCIENTIFIC PUBLICATIONS

MENTASCHI, L., ARAGÃO, L. *et al* **2024**. Projected climate oligotrophication of the Adriatic marine ecosystems. *Frontiers in Climate*, v.6, pp. 1–16. DOI 10.3389/fclim.2024.1338374

ARAGÃO, L. *et al* **2023**. Air quality changes during the COVID-19 pandemic guided by robust virus-spreading data in Italy. *Air Qual. Atm. & Health*, pp. 1–19. DOI 10.1007/s11869-023-01495-x

FLAOUNAS, E., ARAGÃO, L. *et al* **2023**. A composite approach to produce reference datasets for extratropical cyclone tracks: Application to Mediterranean cyclones. *Weather & Clim. Dyn.*, v.4, pp. 639–661. DOI 10.5194/wcd-4-639-2023

COMPUTER SKILLS

Wolfram Mathematica

Python

Fortran

R

Shell Script

GrADS

NCL

WRF

AERMET/AERMOD

AutoCAD

SketchUP

QGIS

LateX

Microsoft Office

Windows

Unix

MAIN DATA VOCABULARY

ReAnalysis, ERA5, CERRA, UERRA, ORAS5, IFS, GFS, GDAS, GloFAS, EFAS, LISFLOOD, EFFIS, EDO, MODIS, E-OBS, EM-DAT, CAMS, CMEMS, NEMO, GPCP, GPM, CHIRPS, HSAF, CMIP6, CORDEX, MM5, WPS, WRF, WRF-Hydro, COSMO, MUR, CDO, GitHub, Overleaf, ERDDAP, C3S, PODAAC, JTWC, JMA, NHC, AERMET, AERMAP, AERMOD, IBTrACS, RADAR, SODAR, LIDAR, GIS, GeoTIFF, KMZ, KML, CSV, XLSX, ASCII, Binary, NetCDF, HDF, HDF4, GRIB, GRIB2, JSON.

SCIENTIFIC PUBLICATIONS CONTINUED

POSSEGA, M., ARAGÃO, L. *et al* **2022**. Observational evidence of intensified nocturnal urban heat island during heatwaves in European cities. E*nviron. Res. Letters*, v.17 (124013), pp.1-12. DOI 10.1088/1748-9326/aca3ba

ARAGÃO, L., & Porcù, F. **2022**. Cyclonic activity in the Mediterranean region from a high-resolution perspective using ECMWF ERA5 dataset. *Clim. Dyn.*, v.58 (5-6), pp.1293-1310. DOI 10.1007/s00382-021-05963-x

DI STASO, R., ARAGÃO, L. *et al* **2022**. Time series analysis of meteorological parameters and air pollution concentrations in Emilia-Romagna (Italy) during COVID-19 infection. *XXI HARMO*, Aveiro, Portugal.

SOARES DA SILVA, M., ARAGÃO, L. *et al* **2022**. Assessment of meteorological settings on air quality modeling system - a proposal for UN-SDG and regulatory studies in non-homogeneous regions in Brazil. *Environ. Sci. & Pol. Res.* v.30, 1737-1760. DOI 10.1007/s11356-022-22146-1

SANCHEZ, P. L., ARAGÃO, L. *et al* **2021**. North Atlantic Oscillation-related impacts on precipitation over the Italian Peninsula during 1979-2020. *EGU General Assembly*. DOI 10.5194/egusphere-egu21-9183

KUMAR, P., ARAGÃO, L. *et al* **2020**. Towards an operationalisation of nature-based solutions for natural hazards. *Sci. Total Environ.*, v.731, 138855. DOI 10.1016/j.scitotenv.2020.138855

SAHANI, J., ARAGÃO, L., *et al* **2019**. Hydro-meteorological risk assessment methods and management by nature-based solutions. *Sci. Total Environ.*, v.696, 133936. DOI 10.1016/j.scitotenv.2019.133936

MACHADO, V.M., ARAGÃO, L. & Pimentel, L.C.G. **2018**. ITCZ seasonal migration over the Brazilian northeast through vertical wind profiles during 2008-2018. *Proceedings XX Brazilian Conf. Meteorology*, v.6, p.1672-1678. Maceió, Brazil.

ARAGÃO, L. *et al* **2017**. Analysis of the IBL formation on tropical coastal regions using SODAR data in Rio de Janeiro (Brazil). *Int. Jour. of Environ. & Pol.*, v.62, p.136-154. DOI 10.1504/IJEP.2017.10010371

ARAGÃO, L. *et al* **2017**. Analysis of the IBL formation on tropical coastal regions using SODAR data in Santa Cruz of MRRJ. *XVII HARMO*, 2016, v.17, p.294-298. Budapest, Hungary.

ARAGÃO, L. *et al* **2014**. Simplified Modeling of Tropospheric Ozone Formation Considering Alternative Fuels Using. *AIGEO*, v.37 (2), p.151-160. DOI 10.11137/2014_2_151_160

SOARES DA SILVA, M., ARAGÃO, L. *et al* **2012**. Estimative of the Convective Boundary Layer height in Rio de Janeiro using AERMET model with different altitude meteorological data. *Proceedings XVII Brazilian Conf. Meteorology*. Gramado, Brazil.

GUIMARAES, J.M., ARAGÃO, L. *et al* **2009**. Case study of a mesoscale convective system associated with a frontal system in Rio de Janeiro. *Proceedings X Argentine Conf. Meteorology and XIII Latin American and Iberic Conf. Meteorology*. Buenos Aires, Argentina.

ARAGÃO, L. & Pimentel, L.C.G., **2008**. Simplified Computational Modeling of Tropospheric Ozone Formation Kinetics. *Proceedings XV Brazilian Conf. Meteorology*. São Paulo, Brazil.

OLIVEIRA JÚNIOR, J. F., ARAGÃO, L. *et al* **2006**. Characterization of Brazilian desertification areas through NCEP ReAnalysis and numerical modeling. *Proceedings VIII ICSHMO*, p.927-934. Foz do Iguaçu, Brazil.

ARAGÃO, L. *et al* **2006**. Impact of climate change on the agroclimatic potential of sugarcane and tomato crops in significantly producing municipalities of Rio de Janeiro. *Proceedings XIV Brazilian Conf. Meteorology*. Florianópolis, Brazil.

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