Pablo Lichtig

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Employment History

2023–present ◇ **Researcher**. National Commission for Atomic Energy. Research topics: Air Pollution (monitoring and modeling), Air Quality model evaluation with *in situ* and remote observations.

2015–present ◇ **Teacher Assistant**. Department of Inorganic, Analytical and Physical Chemistry, Faculty of Natural and Exact Sciences, University of Buenos Aires. Courses taught: General and Inorganic Chemistry I, Physical Chemistry II, Chemical Instrumentation, Atmospheric Chemistry.

2024–2025 ◇ **Postodc Fellow I**. At NSF National Center For Atmospheric Research, Atmospheric Chemistry Observations and Modeling Lab. Core developer of the MELODIES-MONET model evaluation toolkit (: https://github.com/NCAR/MELODIES-MONET). Supervisor: Gabriele Pfister.

2018–2025 ◇ **Ph.D.** University of San Martín and National Commission for Atomic Energy. Research topic: Air Quality in South America. Techniques employed: *In-situ* measurements (continuous: CO, NOx, O_3, SO_2; filter measurements of $PM_{2.5}$ and PM_{10}). Modeling: WRF-Chem with the MOZCART and MOZART-MOSAIC chemical mechanisms, MUSICAv0 with the MOZART-TS1 and MAM4 chemical mechanism. Supervisors: Laura Dawidowski and Darío Gómez.

Sep 2022 ◇ **Research visitor** Visitor at the NSF National Center for Atmospheric Research. Simulations with MUSICAv0. Host: Dr. Gabriele Pfister.
Jul–Sep 2023

2019, 2022 ◇ Two **secondments in the Max Planck Institute for Meteorology** as part of the project "Prediction of Air Pollution in Latin America and the Caribbean". Host: Prof. Guy P. Brasseur. Simulations with WRF-Chem and MUSICAv0.

2013–2017 ◇ Undergraduate **scientific internship** under the supervision of Darío A. Estrín and Ari Zeida. Part time research in protein biochemistry and structural biology, on protein-ligand interactions and enzyme reactivity. Research topic: reactivity of the Alkyl hydroperoxide reductase E (AhpE) of *Mycobacterium tuberculosis*. Techniques employed: computer simulations (classical molecular modeling with the Amber suite) and Förster Resonance Energy Transfer experiments and measurements. Stimulus Scholarship from the University of Buenos Aires awarded.

Teaching experience

2015–present ◇ **Teacher Assistant in the University of Buenos Aires**. Courses taught: General and Inorganic Chemistry I, Physical Chemistry II, Chemical Instrumentation, Atmospheric Chemistry.

Teaching experience (continued)

2024 ◇ **Teacher in the MELODIES-MONET tutorial** (2 days). In charge of the section on *Simple Surface Observation Comparisons* and the Hands-on Section and Advanced concepts: TEMPO. https://www2.acom.ucar.edu/events/414344/agenda.

◇ **ASP Colloquim 2024** (2 weeks). In charge of coordinating some of the sessions and practical work together with Dr. Thierno Doumbia.

2016 ◇ **High School for Adults: "Bachillerato Popular Esquina Rebelde"**. Courses taught: Mathematics.

Education

2025 ◇ **Ph.D., University of San Martín** in Science and Technology: Chemistry.
Air pollution in South America: the effects of local emissions and long range transport.
Courses: Generalized linear models (UNSAM). Statistical Thermodynamics (UBA). School of Atmospheric Measurements in Latin America and the Caribbean (UPPR). Physical Climatology (UBA). Quantitative Optical Remote Sensing (UNSAM). Atmospheric Chemistry (UBA). Summer School: Cities and short lived climate forcers (CR2).

2017 ◇ **Licenciatura in Biological Sciences, University of Buenos Aires** (*roughly equivalent to a Masters degree*).
Orientation: Bioinformatics.

Skills

Languages	◇ Spanish (native), English (fluent) and German (conversational). Basic understanding of Portuguese.
Coding	◇ Python, git, LaTeX, bash, R, basic skills in Fortran, C and Go.
Atmospheric chemistry modeling	◇ WRF-Chem, CAM-Chem, MUSICAv0, Random Forest modeling for Air Quality predictions.
Model evaluation	◇ Ground-level stations (*in situ* and remote), satellite observations (MOPITT, TROPOMI, TEMPO).
Misc.	◇ Academic research, teaching.

Research Publications

Journal Articles

1. P. Lichtig, J. Gelman Constantin, M. Diaz Resquin, *et al.*, "Comprehensive chemical profile and source apportionment of PM2.5 in Buenos Aires: Insights from the southernmost megalopolis," *Atmospheric Environment*, vol. 353, p. 121 236, Jul. 2025, ISSN: 1352-2310. DOI: 10.1016/j.atmosenv.2025.121236.

2. S. Yang, G. Brasseur, S. Walters, P. Lichtig, and C. W. Y. Li, "Global atmospheric distribution of microplastics with evidence of low oceanic emissions," en, *npj Climate and Atmospheric Science*, vol. 8, no. 1, pp. 1–10, Feb. 2025, Publisher: Nature Publishing Group, ISSN: 2397-3722. DOI: 10.1038/s41612-025-00914-3.

3. L. Dawidowski, J. Gelman Constantin, J. Herrera Murillo, *et al.*, "Carbonaceous fraction in PM2.5 of six Latin American cities: Seasonal variations, sources and secondary organic carbon contribution," *Science of The Total Environment*, vol. 948, p. 174 630, Oct. 2024, ISSN: 0048-9697. DOI: 10.1016/j.scitotenv.2024.174630.

4. A. Deroubaix, J. J. Hoelzemann, R. Y. Ynoue, *et al.*, "Intercomparison of air quality models in a megacity: Toward an operational ensemble forecasting system for São Paulo," *Journal of Geophysical Research: Atmospheres*, vol. 129, no. 1, e2022JD038179, 2024.

5. P. Lichtig, B. Gaubert, L. K. Emmons, *et al.*, "Multiscale CO Budget Estimates Across South America: Quantifying Local Sources and Long Range Transport," en, *Journal of Geophysical Research: Atmospheres*, vol. 129, no. 8, e2023JD040434, Apr. 2024, ISSN: 2169-897X, 2169-8996. DOI: 10.1029/2023JD040434.

6. J. E. Pachón, M. A. Opazo, P. Lichtig, *et al.*, "Air quality modeling intercomparison and multiscale ensemble chain for Latin America," en, *Geoscientific Model Development*, vol. 17, no. 20, pp. 7467–7512, Oct. 2024, ISSN: 1991-9603. DOI: 10.5194/gmd-17-7467-2024.

7. M. Diaz Resquin, P. Lichtig, D. Alessandrello, *et al.*, "A machine learning approach to address air quality changes during the COVID-19 lockdown in Buenos aires, Argentina," *Earth System Science Data*, vol. 15, no. 1, pp. 189–209, 2023.

8. Y. Wang, Y.-F. Ma, D. Muñoz-Esparza, *et al.*, "Coupled mesoscale–microscale modeling of air quality in a polluted city using WRF-LES-Chem," *Atmospheric Chemistry and Physics*, vol. 23, no. 10, pp. 5905–5927, 2023.

9. E. O. Lanzarotti, G. Cuesta, M. H. Factorovich, *et al.*, "Tierra y agrotóxicos: Un enfoque coproductivo en problemáticas socioambientales.," 2016.

10. A. Zeida, A. M. Reyes, P. Lichtig, *et al.*, "Molecular basis of hydroperoxide specificity in peroxiredoxins: The case of AhpE from Mycobacterium tuberculosis," *Biochemistry*, vol. 54, no. 49, pp. 7237–7247, 2015.

11. A. Zeida, C. M. Guardia, P. Lichtig, *et al.*, "Thiol redox biochemistry: Insights from computer simulations," *Biophysical reviews*, vol. 6, pp. 27–46, 2014.

Conferences / Workshops

1. P. Lichtig, L. K. Emmons, R. Schwantes, *et al.*, "MELODIES MONET: A User-Friendly, Open-Source Python Tool for Model Evaluation.," in *Joint MPAS/WRF Users Workshop 2025*, 2025. URL: https://www.mmm.ucar.edu/events/133265/agenda.

2. S. Ibarra Espinosa, E. D. d. Freitas, P. Lichtig, *et al.*, "Global Pollution Modeling with Enhanced Resolution in South America," in *AGU Fall Meeting Abstracts*, ser. AGU Fall Meeting Abstracts, vol. 2024, Dec. 2024, A24H-06, A24H–06.

3. P. Lichtig, L. K. Emmons, R. Schwantes, *et al.*, "MELODIES-MONET: A User Friendly, Open-Source Python Tool for Model Evaluation," in *AGU Fall Meeting Abstracts*, ser. AGU Fall Meeting Abstracts, vol. 2024, Dec. 2024, A53AA-01, A53AA–01.

4. S. Ibarra Espinosa, E. D. de Freitas, B. Gaubert, P. Lichtig, L. K. Emmons, and G. P. Brasseur, "Road transportation emissions in Brazil between 1960 and 2100 and impacts on air quality," in *AGU Fall Meeting Abstracts*, 2023.

5. S. Ibarra Espinosa, L. K. Emmons, P. Lichtig, and G. P. Brasseur, "Air pollution simulation in South America using the Multi-Scale Infrastructure for Chemistry and Aerosols (MUSICA) model," in *AGU Fall Meeting Abstracts*, vol. 2022, 2022, A52O–1183.

6. P. Lichtig, B. Gaubert, S. Ibarra-Espinosa, *et al.*, "Simulations of Air quality in South America: Effects of boundary conditions and model intercomparison," in *iCACGP-IGAC Joint Conference*, 2022.

7. P. Lichtig, F. Baraldo Victorica, J. Gelman Constantin, J. Herrera Murillo, D. Gómez, and L. Dawidowski, "Quantification and Characterization of PM2.5 in Buenos aires, Argentina," in *Abstracts of the IGAC Conference*, 2021.

8. P. Lichtig, I. Bouarar, G. Brasseur, and L. Dawidowski, "Air quality Regional Modeling of Latin America and the Caribbean using WRF-Chem model," in *Abstracts of the Gaw Symposium*, 2021.
9. P. Lichtig, A. Zeida, A. M. Reyes, *et al.*, "Understanding substrate selectivity in 1-Cys peroxirredoxin of *M. tuberculosis*," in *Abstracts de la Sociedad Argentina de Biofísica, XLIII*, 2014.
10. P. Lichtig, A. Zeida, M. Hugo, *et al.*, "Reactividad diferencial de peroxirredoxinas frente a distintos sustratos," in *CAFQI 2013 Abstracts*, 2013.

Hobbies

Literature and music

- **Literature:** International Short Story Contest (2005). 2nd Prize. Category: underage. Two short stories published in the book "Antología de Relato Breve III".
- **Music:** Classical and Argentinean Folklore Guitar.

Sports

- **Circus arts:** Floor acrobatics and handstand training.
- **Others:** Hiking, Cycling.

References

- Prof. Darío Gómez (UBA, CNEA, dgomez@cnea.gov.ar)
- Prof. Laura Dawidowski (UNSAM, CNEA, dawidows@cnea.gov.ar)
- Prof. Dr. Guy Brasseur (MPI-Met, guy.brasseur@mpg.mpimet.de)
- Dr. Gabriele Pfister (NSF NCAR, pfister@ucar.edu)