Dr. Hazel Vernier is an atmospheric chemist and balloon-borne aerosol researcher dedicated to advancing our understanding of stratospheric aerosols, volcanic injections, and wildfire PyroCb plumes. Her research integrates *in situ* balloon observations up to 30 km altitude with satellite comparisons (such as SAGE III/ISS) and chemistry transport modeling to build a comprehensive picture of the stratosphere for climate prediction. An expert in field sampling logistics, she coordinates the deployment of integrated payloads featuring lightweight aerosol samplers, POPC particle counters, and COBALD backscatter sondes across key international projects—including BATAL, BraVo, ORACLE, and INSPYRE. While her direct laboratory research utilizes Ion Chromatography (IC) to analyze the inorganic ionic composition of UTLS aerosols—validating GEOS-Chem global transport model results and satellite observations (SAGE III/ISS, ACE-FTS)—she played a pivotal role in field-to-lab operations by executing the precise collection and contamination-controlled preservation of aerosol substrates required for advanced, collaborative Orbitrap Mass Spectrometry (MS) and in the future synchrotron-based microscopic analysis (STXM-NEXAFS). Additionally, she was selected as a visitor for the NASA-ISRO Professional Engineers and Scientists Exchange Program (PESEP) to further international research collaborations.

**Selected Publications**

**First-Author & Key Papers**

- **Vernier, H.**, et al. (2025). Balloon Observations Suggesting Sea Salt Injection into the Stratosphere from Hunga Tonga-Hunga Ha'apai. *Atmospheric Chemistry and Physics Discussions* (under open peer review). DOI: 10.5194/egusphere-2025-924
- **Vernier, H.**, Rastogi, N., Liu, H., et al. (2022). Exploring the inorganic composition of the Asian Tropopause Aerosol Layer using medium-duration balloon flights. *Atmospheric Chemistry and Physics*, 22, 12675–12694. DOI: 10.5194/acp-22-12675-2022

**Collaborative Campaign & Co-Author Papers**

- Benoit, R., **Vernier, H.**, Vernier, J., Joly, L., Dumelié, N., Krysztofiak, G., ... & Berthet, G. (2025). Organics in the stratosphere: New insights from weather balloon flights conducted in France. *Npj Climate and Atmospheric Science*, 8(1), 1–15. DOI: 10.1038/s41612-025-01106-9
- Zhu, Y., Yu, P., Wang, X., Bardeen, C., Borrmann, S., Höpfner, M., ... **Vernier, H.**, ... & Toon, O. B. (2024). Evaluating the Importance of Nitrate-Containing Aerosols for the

Asian Tropopause Aerosol Layer. *Journal of Geophysical Research: Atmospheres*, 129(19). DOI: 10.1029/2024JD041283

- Dumelié, N., Vernier, J.-P., Berthet, G., **Vernier, H.**, Renard, J.-B., Rastogi, N., … & Joly, L. (2023). Toward Rapid Balloon Experiments for Sudden Aerosol Injection in the Stratosphere (REAS) by Volcanic Eruptions and Wildfires. *Bulletin of the American Meteorological Society*. DOI: 10.1175/BAMS-D-22-0086.1
- Vernier, J., Vernier, J.-P., Kalnajs, L., Diaz, J. A., Reese, T., … **Vernier, H.**, … & Murray, J. (2020). VolKilau: Volcano Rapid Response Balloon Campaign during the 2018 Kilauea Eruption. *Bulletin of the American Meteorological Society*, 101, E1602–E1618. DOI: 10.1175/BAMS-D-19-0011.1
- Vernier, J.-P., Fairlie, T. D., Deshler, T., Ratnam, V., Rastogi, N., & **Vernier, H.** (2018). BATAL: The Balloon Measurement Campaigns of the Asian Tropopause Aerosol Layer. *Bulletin of the American Meteorological Society*, 99, 955–973. DOI: 10.1175/BAMS-D-17-0014.1