Currilicum vitae for Dr Nora Zannoni

Name	Nora Zannoni
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ORCID	https://orcid.org/0000-0003-2721-5362
Scopus	56866304000
Loop	523094
Nationality	Italian

Research interests — *Atmospheric chemistry, volatile organic compounds, OH reactivity, biosphere-atmosphere interactions, indoor air chemistry*

Education

01/11/2012- 30/11/2015	PhD in atmospheric chemistry at Laboratoire des sciences du climat et de l'environnement (LSCE- Centre national de la recherche scientifique (CNRS)) and University Paris XI, France. Thesis: "OH reactivity measurements in the Mediterranean region". Marie Curie Early Stage Researcher in "Proton Ionization Molecular Mass Spectrometry".
01/09/2009- 01/11/2011	MSc. in Chemistry, University of Copenhagen, Denmark. Thesis: "A volatility study on organic compounds in atmospheric aerosols" (12/12).
01/10/2004- 20/07/2009	BSc. in Chemistry, University of Florence, Italy. Thesis: "Spectroscopic study of *sigillate ceramic*" (101/110).
01/09/2006- 01/06/2007	Exchange student under the European project Erasmus, Universidad Autonoma de Madrid, Spain.

Working Experience

15/05/2023- on going	Researcher at CNR-ISAC, Italy
01/01/2022- 15/05/2023	Postdoctoral scientist at CNR-ISAC, Italy *VOCs measurements (ACTRIS, EU)*
01/3/2017- 31/12/2021	Postdoctoral scientist at Max Planck Institute for Chemistry, Germany *GC-MS measurements of VOCs and chiral molecules (ULTRACHIRAL, EU& ATTO, BMBF)* *OH reactivity/PTR-MS measurements of human emissions (ICHEAR, A. Sloan foundation)*
01/12/2015- 31/12/2016	Post doctoral scientist at Laboratoire Scientifique du Climat et de l'Environnement, France *OH reactivity and PTR-MS measurements*
01/12/2011- 15/09/2012	Research assistant, University of Copenhagen, Denmark. *TDMA, HTDMA, evaporation model optimization, master thesis tutoring.*
01/10/2010- 01/12/2011	Laboratory technician assistant, Centre for Ice and Climate, Niels Bohr Institute, University of Copenhagen, Denmark. *Ice core samples preparation for the project NEEM (North Greenland Eemian Ice Drilling).*

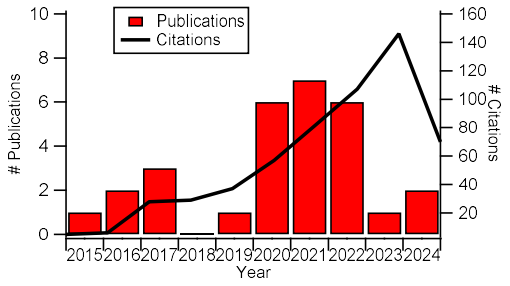
Research activity and field work

04/2024-05/2024	**ECOSISTER,** Indoor measurements in an occupied office, Bologna, Italy. *VOCs with VOCUS CI-ToF*

09/2023-11/2023	**ALFA,** Uni Frankfurt container, Schivenoglia (MN), Italy. *VOCs with VOCUS CI-ToF*
01/2023-03/2024	**RI-URBANS (**Research Infrastructures Services Reinforcing Air Quality Monitoring Capacities in European Urban & Industrial AreaS), CNR-ISAC mobile lab, Milan, Italy. *VOCs with VOCUS CI-ToF& aerosol chemical speciation with ACSM-ToF*
10/2022	ACSM-ToF (Aerosol Chemical Speciation Monitor) **intercomparison campaign for ACTRIS**, LSCE, France
01/2022-06/2022	**FAIRARI** (Fog and Aerosols Interactions Research), Po valley, Italy. *VOCs with VOCUS CI-ToF*
04/2021	**ICHEAR 2** (Indoor Chemical Human Emissions and Reactivity), DTU, Denmark.
04/2019-05/2019	**ICHEAR 1** (Indoor Chemical Human Emissions and Reactivity), DTU, Denmark. *PTR-MS based CRM (OH reactivity) of human emissions.*
2017- 2021	**ATTO** (Amazonian Tall Tower Observatory) dry and wet season campaigns (x6), Brazil. *VOCs sampling up to 325 m height and analysis by GC-TOF-MS*
06/2017-06/2018	**HOMING** (Hunting Organic Molecules In NaviGation), Pisa, Italy *Offline/ online VOCs measurements by GC-MS and PTR-MS.*
06/2016-07/2016	**COV3ER**, INRA, Paris area, France *PTR-MS based CRM (OH reactivity) of winter wheat, ambient and chamber measurements.*
10/2015	**kOH intercomparison**, Saphir atmospheric simulation chamber, FZJ, Germany *PTR-MS based CRM (OH reactivity).*
06/2015-07/2015	**PISA** (PImms-SAphir), Saphir atmospheric simulation chamber, FZJ, Germany *SOA sampling*
05/2014-06/2014	**CANOPEE** 2014, Observatoire Haute Provence, France *PTR-MS based CRM (OH reactivity), PTR-MS, VOCs sampling on tubes.*
06/2013-08/2013	**ChArMEx**, Corsica, France *PTR-MS based CRM (OH reactivity).*

Publications

(*h*-index=13 on Scopus *h*-index=14 on Google scholar)



1) Peer reviewed open access journals

1. **Zannoni, N**., Dusanter, S., Gros, V., Sarda Esteve, R., Michoud, V., Sinha, V., Locoge, N., and Bonsang, B.: *Intercomparison of two comparative reactivity method instruments inf the*

Mediterranean basin during summer 2013, Atmos. Meas. Tech., 8, 3851-3865, doi:10.5194/amt-8-3851-2015, 2015.

2. **Zannoni, N**., Gros, V., Lanza, M., Sarda, R., Bonsang, B., Kalogridis, C., Preunkert, S., Legrand, M., Jambert, C., Boissard, C., and Lathiere, J.: *OH reactivity and concentrations of biogenic volatile organic compounds in a Mediterranean forest of downy oak trees,* Atmos. Chem. Phys., 16, 1619-1636, doi:10.5194/acp-16-1619-2016, 2016.
3. Yáñez-Serrano, A. M., Nölscher, A. C., Bourtsoukidis, E., Derstroff, B., **Zannoni, N.**, Gros, V., Lanza, M., Brito, J., Noe, S. M., House, E., Hewitt, C. N., Langford, B., Nemitz, E., Behrendt, T., Williams, J., Artaxo, P., Andreae, M. O., and Kesselmeier, J.: Atmospheric mixing ratios of methyl ethyl ketone (2-butanone) in tropical, boreal, temperate and marine environments, Atmos. Chem. Phys., 16, 10965–10984, https://doi.org/10.5194/acp-16-10965-2016, 2016.
4. **Zannoni, N**., Gros, V., Sarda Esteve, R., Kalogridis, C., Michoud, V., Dusanter, S., Sauvage, S., Locoge, N., Colomb, A., and Bonsang, B.: *Summertime OH reactivity from a receptor coastal site in the Mediterranean Basin*, Atmos. Chem. Phys., 17, 12645-12658, https://doi.org/10.5194/acp-17-12645-2017, 2017.
5. Fuchs, H., Novelli, A., Rolletter, M., Hofzumahaus, A., Pfannerstill, E. Y., Kessel, S., Edtbauer, A., Williams, J., Michoud, V., Dusanter, S., Locoge, N., **Zannoni, N**., Gros, V., Truong, F., Sarda-Esteve, R., Cryer, D. R., Brumby, C. A., Whalley, L. K., Stone, D., Seakins, P. W., Heard, D. E., Schoemaecker, C., Blocquet, M., Coudert, S., Batut, S., Fittschen, C., Thames, A. B., Brune, W. H., Ernest, C., Harder, H., Muller, J. B. A., Elste, T., Kubistin, D., Andres, S., Bohn, B., Hohaus, T., Holland, F., Li, X., Rohrer, F., Kiendler-Scharr, A., Tillmann, R., Wegener, R., Yu, Z., Zou, Q., and Wahner, A.: *Comparison of OH reactivity measurements in the atmospheric simulation chamber SAPHIR*, Atmos. Meas. Tech., 10, 4023–4053, https://doi.org/10.5194/amt-10-4023-2017, 2017.
6. Vincent Michoud, Jean Sciare, Stéphane Sauvage, Sébastien Dusanter, Thierry Léonardis, Valérie Gros, Cerise Kalogridis, **Nora Zannoni**, Anaïs Féron, Jean-Eudes Petit, Vincent Crenn, Dominique Baisnée, Roland Sarda-Estève, Nicolas Bonnaire, Nicolas Marchand, H. Langley DeWitt, Jorge Pey, Aurélie Colomb, François Gheusi, Sonke Szidat, Iasonas Stavroulas, Agnès Borbon, and Nadine Locoge. *Organic carbon at a remote site of the western Mediterranean Basin: Sources and chemistry during the ChArMEx SOP2 field experiment* Atmos. Chem. Phys., 17, 8837-8865, https://doi.org/10.5194/acp-17-8837-2017, 2017.
7. Schramm S, **Zannoni N**, Gros V, et al. *New application of direct analysis in real time high-resolution mass spectrometry for the untargeted analysis of fresh and aged secondary organic aerosols generated from monoterpenes*. Rapid Commun Mass Spectrom. 2019; 1–10. https://doi.org/10.1002/rcm.8228
8. Bsaibes, S.; Gros, V.; Truong, F.; Boissard, C.; Baisnée, D.; Sarda-Esteve, R.; **Zannoni, N.**; Lafouge, F.; Ciuraru, R.; Buysse, P.; Kammer, J.; Gonzaga Gomez, L.; Loubet, B. *Characterization of Total OH Reactivity in a Rapeseed Field: Results from the COV3ER Experiment in April 2017.* Atmosphere 2020, 11, 261 https://doi.org/10.3390/atmos11030261
9. Bekö, G.; Wargocki, P.; Wang, N.; Li, M.; Weschler, C. J.; Morrison, G.; Langer, S.; Ernle, L.; Licina, D.; Yang, S.; **Zannoni, N**.; Williams, J. *The Indoor Chemical Human Emissions and Reactivity (ICHEAR) Project: Overview of Experimental Methodology and Preliminary Results.* Indoor Air 2020, 30 (6), 1213–1228. https://doi.org/10.1111/ina.12687.
10. **Zannoni, N**., Wikelski, M., Gagliardo, A. et al. *Identifying volatile organic compounds used for olfactory navigation by homing pigeons*. Sci Rep 10, 15879 (2020). https://doi.org/10.1038/s41598-020-72525-2
11. **Zannoni, N**., Leppla, D., Lembo Silveira de Assis, P.I. et al. *Surprising chiral composition changes over the Amazon rainforest with height, time and season*. Commun Earth Environ 1, 4 (2020). https://doi.org/10.1038/s43247-020-0007-9

12. Wang, N.; **Zannoni, N**.; Ernle, L.; Bekö, G.; Wargocki, P.; Li, M.; Weschler, C. J.; Williams, J. *Total OH Reactivity of Emissions from Humans: In Situ Measurement and Budget Analysis*. Environ. Sci. Technol. 2021, 55 (1), 149–159. https://doi.org/10.1021/acs.est.0c04206.
13. Pfannerstill, E. Y., Reijrink, N. G., Edtbauer, A., Ringsdorf, A., **Zannoni, N**., Araújo, A., Ditas, F., Holanda, B. A., Sá, M. O., Tsokankunku, A., Walter, D., Wolff, S., Lavrič, J. V., Pöhlker, C., Sörgel, M., and Williams, J.: *Total OH reactivity over the Amazon rainforest: variability with temperature, wind, rain, altitude, time of day, season, and an overall budget closure*, Atmos. Chem. Phys., 21, 6231–6256, https://doi.org/10.5194/acp-21-6231-2021, 2021.
14. **Zannoni, N**., Li, M., Wang, N., Ernle, L., Bekö, G., Wargocki, P., Langer, S., Weschler, C. J., Morrison, G., Williams, J.: *The effect of ozone, clothing, temperature and humidity on the total OH reactivity emitted from humans*, Environ. Sci. Technol., https://doi.org/10.1021/acs.est.1c01831, 2021.
15. Wikelski, M., Quetting, M., Cheng, Y., Fiedler, W., Flack, A., Gagliardo, A., Salas, R., **Zannoni, N**., Williams, J.: *Smell of green leaf volatiles attracts White storks to freshly cut meadows*, Sci Rep 11, 12912 (2021). https://doi.org/10.1038/s41598-021-92073-7.
16. **Zannoni N**.: *Homing pigeons find their way home by smelling the air*, The Science Breaker, 2021 https://doi.org/10.25250/thescbr.brk553.
17. Yang, S., Bekö, G., Weschler, C. J., Wang, N., **Zannoni, N**., Li, M., Williams, J., Wargocki, P., Langer, S., Vanhanen, J., Licina, D.: *Ozone Initiates Human Emission of Nanocluster Aerosols*, Environmental Science & Technology 2021 55 (21), 14536-14545 DOI: 10.1021/acs.est.1c03379, (2021).
18. Edtbauer A., Pfannerstill, E. Y., Pires Florentino, A.P., Barbosa, C.G.G., Rodriguez-Caballero E., **Zannoni, N**., Alves, R.P., Wolff, S., Tsokankunku, A., Aptroot, A., de Oliveira Sá, M., de Araújo, A.C., Sörgel, M., Mota de Oliveira, S., Weber, B., and Williams, J. *Cryptogamic organisms are a substantial source and sink for volatile organic compounds in the Amazon region*. Commun Earth Environ 2, 258 (2021). https://doi.org/10.1038/s43247-021-00328-y
19. Loubet, B., Buysse, P., Gonzaga-Gomez, L., Lafouge, F., Ciuraru, R., Decuq, C., Kammer, J., Bsaibes, S., Boissard, C., Durand, B., Gueudet, J.-C., Fanucci, O., Zurfluh, O., Abis, L., **Zannoni, N**., Truong, F., Baisnée, D., Sarda-Estève, R., Staudt, M., and Gros, V.: *Volatile organic compound fluxes over a winter wheat field by PTR-Qi-TOF-MS and eddy covariance*, Atmos. Chem. Phys., 22, 2817–2842, https://doi.org/10.5194/acp-22-2817-2022 (2022).
20. E. Gomes Alves, T. Taylor, M. Robin, D. Pinheiro Oliveira, J. Schietti, S. Duvoisin Júnior, **N. Zannoni**, J. Williams, C. Hartmann, J. F. C. Gonçalves, J. Schöngart, F. Wittmann, M. T. F. Piedade, Plant Biol J, doi:10.1111/plb.13419 (2022).
21. M. Li, G. Bekö, **N. Zannoni**, G. Pugliese, M. Carrito, N. Cera, C. Moura, P. Wargocki, P. Vasconcelos, P. Nobre, N. Wang, L. Ernle, J. Williams, *Human metabolic emissions of carbon dioxide and methane and their implications for carbon emissions*. Science of The Total Environment, 155241 (2022).
22. **N. Zannoni**, P. S. J. Lakey, Y. Won, M. Shiraiwa, D. Rim, C. J. Weschler, N. Wang, L. Ernle, M. Li, G. Bekö, P. Wargocki, J. Williams, *The human oxidation field*. Science. 377, 1071–1077 (2022).
23. Leppla, D., **Zannoni, N.**, Kremper, L., Williams, J., Pöhlker, C., Sá, M., Solci, M. C., and Hoffmann, T.: Varying chiral ratio of pinic acid enantiomers above the Amazon rainforest, Atmos. Chem. Phys., 23, 809–820, https://doi.org/10.5194/acp-23-809-2023, (2023).
24. Cai, J., Sulo, J., Gu, Y., Holm, S., Cai, R., Thomas, S., Neuberger, A., Mattsson, F., Paglione, M., Decesari, S., Rinaldi, M., Yin, R., Aliaga, D., Huang, W., Li, Y., Gramlich, Y., Ciarelli, G., Quéléver, L., Sarnela, N., Lehtipalo, K., **Zannoni, N.**, Wu, C., Nie, W., Kangasluoma, J., Mohr, C., Kulmala, M., Zha, Q., Stolzenburg, D., and Bianchi, F.: Elucidating the

mechanisms of atmospheric new particle formation in the highly polluted Po Valley, Italy, Atmos. Chem. Phys., 24, 2423–2441, https://doi.org/10.5194/acp-24-2423-2024, 2024

25. Buysse, P., Loubet, B., Ciuraru, R., Lafouge, F., Durand, B., Zurfluh, O., Décuq, C., Fanucci, O., Gonzaga Gomez, L., Gueudet, J.-C., Bsaibes, S., **Zannoni, N.**, and Gros, V.: First measurements of ecosystem-scale biogenic volatile organic compound fluxes over rapeseed reveal more significant terpenoid emissions than expected, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2023-2438, 2024.
26. S. Langer, C. J. Weschler, G. Bekö, G. Morrison, A. Sjöblom, G. Giovanoulis, P. Wargocki, N. Wang, **N. Zannoni**, S. Yang, J. Williams, Squalene Depletion in Skin Following Human Exposure to Ozone under Controlled Chamber Conditions. Environ. Sci. Technol., doi: 10.1021/acs.est.3c09394 (2024).

2) Book chapters

Loubet B., Baisnee D., Cazaunau M., Cheiney A., Ciuraru R., Clerbaux C., Doussin J.F., Dufour G., Fléchard C., Focsa C., George C., Gros V., Hassouna M., Jaffrezo J.L., Kammer J., Laville P., Mellouki W., Millet, P., Petitprez D., Quivet E., Redon N., Sarda-Esteve R., Sauvage S., Uzu G., Villenave E., **Zannoni, N**. (2020) Measuring Air Pollutant Concentrations and Fluxes. In: Bedos C., Génermont S., Castell JF., Cellier P. (eds) Agriculture and Air Quality. Springer, Dordrecht. https://doi.org/10.1007/978-94-024-2058-6_6

Gros, V., & **Zannoni, N.** (2022). Total OH reactivity. In F. Dulac, S. Sauvage, & E. Hamonou (Eds.), Atmospheric chemistry in the Mediterranean (Vol. 2, From air pollutant sources to impacts). Springer, in press. https://doi.org/10.1007/978-3-030-82385-6_7

Nora Zannoni (2023). The Earth's atmosphere. In I. Riccardi, & C. Sand-Iversen (Eds.), Our Future with Nature. Really Simple Syndication, Copenhagen. https://www.rssprss.net/shop/p/our-future-with-nature

3) 30 Publications in conference proceedings

4) PhD Thesis

Nora Zannoni: "OH reactivity measurements in the Mediterranean region", PhD thesis defended on 30/11/2015, University Paris XI, France. PhD supervisor: Dr. Valerie Gros, PhD co-supervisor: Dr. Bernard Bonsang.

More about my work from the media

- **The Human Oxidation Field**

https://www.mpg.de/19157061/0902-chem-oxidation-field-152990-x?c=2249, Interview.
https://www.science.org/doi/10.1126/science.add8461
Science Podcast AAAS, 1/09/2022 https://www.science.org/content/podcast/using-free-floating-dna-find-soldiers-remains-and-how-people-contribute-indoor-air, Interview.
https://www.nationalgeographic.de/wissenschaft/2022/09/chemische-aura-wie-menschen-die-luft-in-innenraeumen-beeinflussen
https://www.the-scientist.com/news-opinion/a-new-culprit-in-air-pollution-reactions-triggered-by-human-skin-70455
https://www.bbc.com/portuguese/curiosidades-62976278, Interview.
https://www.cnr.it/it/news/11344/nora-zannoni-dal-max-planck-al-cnr-isac
https://www.faz.net/aktuell/wissen/chemie-schleier-in-innenraeumen-braut-der-mensch-sich-seine-eigenen-giftwolken-18293761.html
https://pubs.acs.org/doi/10.1021/cen-10044-cover6
https://cen.acs.org/education/science-communication/CENs-Year-Chemistry-2022/100/i44

(recognized as “fascinating chemistry findings of 2022” by C&EN mag)

- **ATTO project**

https://www.attoproject.org/study-termites-as-bvoc-source/, Interview.
https://ecoevocommunity.nature.com/posts/fingerprinting-sources-of-emissions-of-volatile-organic-compounds-in-the-amazonian-rain-forest
https://onlinelibrary.wiley.com/doi/10.1002/ciuz.202010006
https://www.attoproject.org/total-oh-reactivity/
https://www.attoproject.org/cryptogams-are-an-important-source-for-bvoc-emissions-in-tropical-forests/
“Il pianeta sotto gli occhi”, Internazionale 3/9 May 2024, nr. 1561
https://www.internazionale.it/magazine/2024/05/02/il-pianeta-sotto-gli-occhi
https://bologna.repubblica.it/cronaca/2024/05/10/news/donna_cambiamento_climatico_amazzonia_pianura_padana-422909883/, Interview.
TV show “Bologna a colori”, TRC Bologna, 28/05/2024, Interview.

- **Animal behaviour**

https://www.mpg.de/17069936/storks-smell?c=2249
https://www.welt.de/regionales/rheinland-pfalz-saarland/article231979721/Geruchssinn-Duft-von-gemaehtem-Gras-lockt-Stoerche-an.html
https://www.suedostschweiz.ch/wirtschaft/2021-06-21/unterschaetzter-geruchssinn-duft-von-gemaehtem-gras-lockt-stoerche-an
https://www.mpg.de/15506106/odours-navigation-pigeon?c=2249, Interview.
https://www.derstandard.de/story/2000122684956/tauben-erstellen-exakte-geruchslandkarten-zur-orientierung?ref=rec

Reviewing and Editorial activities

Reviewer for *Atmospheric Environment, Atmospheric Chemistry and Physics*, *Atmospheric Measurement Technique, Environmental Science and Technology (ACS), Environmental Science and Pollution Research (Springer), Chemoecology (Springer), Forests, Frontiers, Communications Earth& Environment.*
Convener for the ATTO workshop 2021 (online, 10/2021, #150 participants).
Reviewer for the conferences Indoor Air 2022, Healthy Buildings Asia 2023, Indoor Air 2024.
Editorial Board Member of *Communications Earth&Environment, Nature group* (since January 2024).

Associations/ Network

“Proton Ionization Molecular Mass Spectrometry” Marie Curie Early Stage Researchers (coordinator Prof. Christopher Mayhew, University of Birmingham, 11/2012-11/2015).
Representative Board of Early Career Scientists “ILEAPS (Integrated Land Ecosystem-Atmosphere Processes Study)” European and Mediterranean division, (2017- on going).
Member of the project ATTO (https://www.attoproject.org/), and of the ATTO site-neighbor communities informative science project for students and teachers (communities Uatumã river, Amazonia, Brazil). Member of Nordic Society for Aerosol Research (NOSA, 2011- on going), member of International Society of Indoor Air Quality and Climate (ISIAQ, 2020&2022), member of Società Italiana di Aerosol (IAS, 2022), member of Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS, 2022-on going).

Language Skills

	Native	Excellent	Medium	Basic
Italian	X			
English		X		
Spanish			X	
French			X	
German				X
Danish				X
Portuguese				X

Computer skills and competences

Microsoft Office tools, Origin, iGOR Wavemetrics, Aerosol Instrument Manager, PTR-MS viewer, Chem Station, Mass Hunter, TOF-DS, Chromspace, basic skills in MatLab and Rstudio, Tofware.

Other information

Driving license (B), swimming (>20 years), open water diving license (18m depth), trained to conduct first aid in remote locations and from towers, experienced in working in extreme conditions (tropical environment) and on tall towers (40-325 m).