

Hartmut Herrmann



Professor Dr. Hartmut Herrmann

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Function

Head of the Atmospheric Chemistry Department at the Leibniz-Institute for Tropospheric Research (TROPOS), Leipzig

Department

Chemistry of the Atmosphere

Research areas & research interest

- Our research intends to understand the tropospheric multiphase system.
- Model development is based on experimental work in the laboratory and in the field.
- Lab work utilises state-of-the-art physical and analytical chemistry methods to study gas phase, aqueous phase, organic phase, surface and, altogether, multiphase phenomena.
- Field work aims to understand chemical processing and composition of tropospheric particles, clouds, fog and rain in the complex interplay of all compartments involved.

Current projects

- "IUPAC Task Force" for Evaluated Kinetic Data for Atmospheric Chemistry

- "EUROCHAMP 2020" Integration of European Simulation Chambers for Investigating Atmospheric Processes – Towards 2020 and beyond
- "SEACRIFOG" Supporting EU-African Cooperation on Research Infrastructures for Food Security and Greenhouse Gas Observations
- "TRACE" Transport and transformation of atmospheric aerosol in Central Europe with a focus on anthropogenic sources
- „PHOTOSOA“ Photosensitization: A novel pathway to SOA generation and property change in tropospheric particles
- "PHOSDMAP" Phosphorus Speciation in Mineral Dust and Marine Aerosol Particles
- "UFOPLAN-BC" Acquisition of Black Carbon (BC) in Germany and identification of relevant sources with chemistry transportation models
- "BBCOMP" Biomass burning organic aerosol in Europe and Asia: Molecular composition and impact on air quality
- Determination of the EC/OC amount of PM10 samples
- "GRIMEPASS" Characterization of Urban Grime Photochemistry as Sink or Source for Air Pollutants
- „DUSTRISK“ A risk index for health effects of mineral dust and associated microbes
- „DARK KNIGHT II“ Daytime atmospheric chemistry of key compounds provoked by nighttime atmospheric chemistry (Dark Knight GZ II) and the follow-up proposal for the project
- Transfer of the analysis of anhydromonosaccharides into the routine operation of the Saxon air quality measurement network
- Trends, triggers and effects of the ozone load in Saxony

In total 117 third-party funded research projects with about 18 Mio Euro funding for the group.

Completed projects

(Selection of 5)

- ACTRIS PPP – Aerosols, Cloud and Trace gases Preparatory Phase Project
- Oceanic surface processes in the Anthropocene – SOPRAN
- The atmospheric chemistry day of key compounds by the atmospheric chemistry night (DARK KNIGHT)
- Marine-biological production, organic aerosol particles and maritime clouds: A process chain (MarParCloud)
- Additional load of wood heatings

Teaching

Professor of Atmospheric Chemistry at the University of Leipzig

- Lecture "Chemistry of the atmosphere – Basics"
- Lecture "The tropospheric multiphase system"
- Seminar: Atmospheric Chemistry
- Lab Course: Atmospheric Chemistry
- Students individual lab courses

Memberships

- Deutsche Bunsengesellschaft für Physikalische Chemie (DBG)
- Gesellschaft Deutscher Chemiker (GDCh)
- Section Photochemie the GDCh
- Section Wasserchemie the GDCh
- Head of the working group Atmosphärenchemie the GDCh in the Section of Environmental Chemistry and Ecotoxicology
- DECHEMA/GDCh/Bunsengesellschaft Joint Committee "Chemie, Luftqualität und Klima" (CLK)"
- ProcessNet Working Committee "Feinstaub" by DECHEMA, GDCh and KRdL, Co-Chair (with R. Zellner and T. Eikmann)
- Fellow of International Union of Pure and Applied Chemistry - IUPAC
- Appointed member of the Scientific Advisory Board der „Kommission Reinhaltung der Luft“ (KRdL) in VDI and DIN
- Member of the Evaluation Commission of the Czech Academy of Sciences
- Member of the American Chemical Society (ACS)
- Member of the Second International Indian Ocean Expedition (IIOE-2) Committee
- German Co-representative of the International Surface Ocean – Lower Atmosphere Study project (SOLAS)
- IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation
- Steering Committee of the ProcessNet Community "Sustainable Production, Energy and Resources" (SuPER) (DECHEMA)

Curriculum vitae

Academic qualification

1982-1985 Study of chemistry (basic part Georg August University in Göttingen
07/1985 Pre-Diploma Exam

1985-1986 Study of chemistry (main part) Georg August University in Göttingen
1986-1987 Diploma Thesis work under the auspices of Prof. Dr. R. Zellner, Topic: "Blitzlichtphotolyse-Konduktometrie-Untersuchungen und Simulationsrechnungen zur Photolyse des Nitrat-Ions" Institute for Physical Chemistry of the University of Göttingen
07/1987 Diploma Exam
1987-1990 Ph.D. thesis work under the auspices of Prof. Dr. R. Zellner, Topic: "Zeitaufgelöste Laser-Photolyse und Stopped-Flow-Untersuchungen atmosphärisch-chemischer Oxidantien in wäßriger Phase", (i.e. "Time-resolved Laser Photolysis and Stopped-Flow Investigations of atmospheric Oxidants in aqueous Solution" Doctoral fellowship from the Fonds der Chemischen Industrie Institute for Physical Chemistry at the University of Göttingen
02/1990 Oral doctoral examination in the subjects of inorganic chemistry, physical chemistry and computer science. Degree scholarship from the Fonds der Chemischen Industrie

Research experience

1986-1987 Teaching assistant Institute for Physical Chemistry at the University of Göttingen
1987-1990 Ph. D student Institute for Physical Chemistry at the University of Göttingen, sponsored by a stipend of the "Fonds der Chemischen Industrie (FCI)"
1990-1991 Research scientist Institute for Physical Chemistry and Electrochemistry at the University of Hannover
1991-1992 Research scientist Institute for Physical and Theoretical Chemistry at the University of Essen
09/1992-04/93 Research stay (sponsored by a NATO/DAAD-Stipend) as Visiting Associate in Environmental Engineering Science California Institute of Technology, Pasadena, CA, U.S.A. with Prof. Michael R. Hoffmann
06/1993- 05/1996 Appointment as "Wissenschaftlicher Assistent (C1) Institute for Physical and Theoretical Chemistry at the University of Essen
09-11/1994 Research stay as a Visiting Associate CalTech
03-04/1995 Research stay as a Visiting Associate CalTech
06/1996-07/1998 Appointment as "Wissenschaftlicher Assistent (C1)" Institute for Physical and Theoretical Chemistry at the University of Essen
05/1998 End of the Habilitation procedure with the thesis "Photochemische Bildung, Spektroskopie und Kinetik freier Radikale in wäßriger Lösung", (i.e."Photochemical Formation, Spectroscopy and Kinetics of Free Radicals in Aqueous Solution"). Venia Legendi for Physical Chemistry
Since 08/1998 Visiting professor Shandong University (SDU) at Jinan and Fudan University (FDU) at Shanghai

Stipends & Prizes

- Double-Hundred Talent Plan the province Shangdong, 2018-2020
- Gay-Lussac-Humboldt-Prize, 2009/2010: for excellence in science and fostering French-German scientific collaboration - first German recipient of this prize in Atmospheric Sciences
- Research grant by the German Chemical Industry Fund (FCI), 1997
- Post-Doc scholarship by NATO/DAAD, 1992/1993
- Graduation scholarship of the German Chemical Industry Fund (FCI), 1990
- Ph.D. scholarship of the German Chemical Industry Fund (FCI), 1987

Publications

(selection)

- Ng, N. L., Brown, S. S., Archibald, A. T., Atlas, E., Cohen, R. C., Crowley, J. N., Day, D. A., Donahue, N. M., Fry, J. L., Fuchs, H., Griffin, R. J., Guzman, M. I., Herrmann, H. et. al. Nitrate radicals and biogenic volatile organic compounds: oxidation, mechanisms, and organic aerosol. *Atmospheric Chemistry and Physics* 17, 2103-2162, doi:10.5194/acp-17-2103-2017 (2017).
- Berndt, T., Herrmann, H., Sipilä, M. & Kulmala, M. Highly Oxidized Second-Generation Products from the Gas-Phase Reaction of OH Radicals with Isoprene. *The Journal of Physical Chemistry A* 120, 10150-10159, doi:10.1021/acs.jpca.6b10987 (2016).
- Hoffmann, E. H., Tilgner, A., Schrödner, R., Bräuer, P., Wolke, R. & Herrmann, H. An advanced modeling study on the impacts and atmospheric implications of multiphase dimethyl sulfide chemistry. *Proceedings of the National Academy of Sciences* 113, 11776-11781, doi:10.1073/pnas.1606320113 (2016).
- Li, X., Li, X., Chen, M., Le, H. P., Wang, F., Guo, Z., Iinuma, Y., Chen, J. M. & Herrmann, H. Atmospheric outflow of PM2.5 saccharides from megacity Shanghai to East China Sea: Impact of biological and biomass burning sources. *Atmospheric Environment* 143, 1-14, doi:10.1016/j.atmosenv.2016.08.039 (2016).
- van Pinxteren, D., Fomba, K. W., Spindler, G., Müller, K., Poulain, L., Iinuma, Y., Löschau, G., Hausmann, A. & Herrmann, H. Regional

air quality in Leipzig, Germany: detailed source apportionment of size-resolved aerosol particles and comparison with the year 2000.
Faraday Discussions 189, 291-315, doi:10.1039/c5fd00228a (2016).

In total 345 peer-reviewed articles (14.818 citations (ISI WoS)), 16 book chapters and 805 other publications.

all publications

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