Dr. Petra Klein

Assistant Professor, School of Meteorology, University of Oklahoma
Email: pkklein@ou.edu, Phone: (405) 325 1631

Professional Preparation

University of Karlsruhe, Germany. Physics, Diploma (German equivalent to M.S.) 1993.
University of Karlsruhe, Germany. Civil Engineering, Ph.D. 1999.

Appointments

2002 - present	Assistant Professor, School of Meteorology, University of Oklahoma, Norman, Oklahoma, USA.
2000 - 2002	Visiting Assistant Professor, School of Civil Engineering and Environmental Science, University of Oklahoma, Norman, Oklahoma, USA.
1999-2000	Post-Doctoral Research Associate, Institute for Atmospheric and Climate Science, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland.
1993-1999	Research Associate, Institute for Hydromechanics and Institute of Hydrology and Water Resources, University of Karlsruhe, Germany.

Teaching

Spring 2005	Micrometeorology, Senior/Graduate level, lecturer.
Spring 2004	Air Pollution Meteorology and Modelling, Senior/Graduate level, lecturer.
Fall 2003, 2004	Meteorological Measurement Systems, Junior level, lecturer.
Spring 2003	Introduction to Meteorology, Freshman/Sophomore level, lecturer.
2001 - 2002	Air Quality Management and Air Pollution Control Engineering, graduate courses, lecturer.
SS 2000	Applied Air Pollution Modelling, Senior level, teaching assistant.
WS 95/96-SS97	Applied Statistics for Civil Engineers, Senior level, teaching assistant.
1994 - present	Supervisor of several diploma and master theses.

Professional Service:

Member of Undergraduate Studies Committee, School of Meteorology, University of Oklahoma
Undergraduate Advisor, School of Meteorology, University of Oklahoma
Member of the AMS Board on the Urban Environment
Reviewer for *Journal of Applied Meteorology*, *Atmospheric Environment*, *Atmospheric Research*, *Boundary Layer Meteorology*, *Environmental Fluid Mechanics* and *Environmental Management*

Professional Associations:

Member of the Air and Waste Management Society
Member of the American Meteorological Society

Areas of Research Interests

Atmospheric boundary layer research and tropospheric pollution problems. In particular: Flow and turbulence characteristics in urban areas, modelling of atmospheric dispersion processes, and wind tunnel modelling of geophysical flow phenomena.

Refereed Journals Articles (within last 5 years):

N. Kljun, P. Kastner-Klein, E. Fedorovich, M.R. Rotach, 2004. Evaluation of Lagrangian footprint model using data from wind tunnel convective boundary layer. *Agricultural and Forest Meteorology*, **127,** 189-201.

P. Kastner-Klein, R. Berkowicz, R. Britter, 2004. The influence of street architecture on flow and dispersion in street canyons. Accepted in *Meteorology and Atmospheric Physics,* **87,** 121-131.

P. Kastner-Klein, M. W. Rotach, 2004. Mean flow and turbulence characteristics in an urban roughness sublayer. *Boundary Layer Meteorology,* **111**, 55-84.

S. Di Sabatino, P. Kastner-Klein, R. Berkowicz, R. Britter, E. Fedorovich, 2003. The modeling of turbulence from traffic in urban dispersion models – Part I: Theoretical considerations. *Environmental Fluid Mechanics,* **3**, 129-143.

P. Kastner-Klein, M. Ketzel, R. Berkowicz, E. Fedorovich, R. Britter, 2003. The modelling of turbulence from traffic in urban dispersion models – Part II: Evaluation against laboratory and full-scale concentration measurements in street canyons. *Environmental Fluid Mechanics,* **3**, 145-172.

P. Kastner-Klein, E. Fedorovich, 2002. Diffusion from a line source deployed in a homogeneous roughness layer: interpretation of wind tunnel measurements by means of simple mathematical models. *Atmospheric Environment,* **36**, 3709-3718.

P. Kastner-Klein, E. Fedorovich, M. W. Rotach, 2001. A wind tunnel study of organised and turbulent air motions in urban street canyons. *Journal of Wind Engineering and Industrial Aerodynamics,* **89,** 849-861.

P. Kastner-Klein, R. Berkowicz, E. J. Plate, 2000. Modelling of vehicle induced turbulence in air pollution studies for streets. *International Journal of Environment and Pollution,* **14**, 496-507.

P. Kastner-Klein, E. Fedorovich, J.-F. Sini, P.G. Mestayer, 2000. Experimental and numerical verification of similarity concept for diffusion of car exhaust gases in urban street canyons. *Environmental Monitoring and Assessment,* **65**, 353-361.

Synergistic Activities

(*i*) Leads an effort to improve the meteorological instrumentation course in the undergraduate (UG) curriculum of the School of Meteorology (SOM) and to integrate hands-on, interactive teaching experiences in the SOM UG curriculum. Participates actively in the development of an outdoor environmental laboratory (Thunderbird Micronet) for students (since 2002).

(*ii*) Member of the science team of the urban flow and tracer experiment 'Joint Urban 2003 (JU2003)" which took place in Oklahoma City during July 2003. Operated two towers in an urban street canyon and was one of three PIs planning and conducting the street canyon study of JU2003 (2002-2004)

(*iii*) Studied the mean flow and turbulence characteristics in the urban roughness sublayer (RSL) and suggested parameterizations for flow profiles in the RSL (1999-2004).

(*iv*) Verified a concept for wind-tunnel modeling of traffic produced turbulence (TPT), proved the significance of the TPT for the dispersion of traffic emissions, and developed parameterizations for incorporation of the TPT in urban dispersion models (1997-2002).

(*v*) Contributed to urban-environment interdisciplinary network of research teams from ten European countries. Organized a number of meetings within this network, performed as chairperson of one of the network working groups and led the dissemination of the achieved results through the Internet and in a number of publications. (1999-2000).