

Bernhard Rappenglück
Professor - Atmospheric Science

Department of Earth and Atmospheric Sciences (EAS), University of Houston
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Professional Preparation

Munich University of Technology (TUM)	Atmos. Environ. Chem.	Habilitation	2003
University of Munich (LMU)	Physics	Ph.D.	1996
University of Munich (LMU)	Meteorology	M.S.	1991
Munich University of Technology (TUM)	Technical Physics	B.S.	1985

Appointments

Full Professor	University of Houston Dpt. of EAS	Sept.2016 – Present
Associate Professor	University of Houston Dpt. of EAS	Sept.2004 – Aug.2016
Sen. Res. Scientist	Res. Cent. Karlsruhe IMK-IFU	Apr.2001 – Aug.2004
Research Scientist	LMU/TUM, Munich Bioclim&AirPollRes	Jan.1991 – Mar.2001

Research Interests

- 1) Biosphere-atmosphere exchange, boundary layer processes and mesoscale meteorology.
- 2) Quantification of trace gas budgets (e.g. carbon monoxide [CO], volatile organic compounds [VOC], peroxides [RO₂], nitrogen oxides [NO_x], peroxyacyl nitrates [PANs], ozone [O₃], sulfur dioxide [SO₂]) in unpolluted and polluted areas (e.g. Munich, Berlin, Athens, Santiago de Chile, Mexico City, Los Angeles, Houston, Dallas).
- 3) Atmospheric radical chemistry involving formaldehyde [HCHO], hydrogen peroxide [H₂O₂] and nitrous acid [HONO],
- 4) Source apportionment for primary pollutants.
- 5) Application and development of chemistry-transport modeling such as WRF-CMAQ.

Professional Experience

University of Houston

Within the Department of Earth and Atmospheric Sciences teaching addresses areas of atmospheric chemistry and meteorology. Lead in the implementation of the Master and PhD degree program in Atmospheric Science (MS approved in 2007; PhD approved in 2010).

Research foci address the determination of anthropogenic and biogenic contributions to the formation of secondary compounds in the atmosphere, more precisely the impact of volatile organic compounds (VOC) on the formation of peroxyacyl nitrates (PANs) and the role of formaldehyde and H₂O₂ in photochemical processes. Implementation of the necessary laboratory infrastructure for measurements of O₃, NO, NO₂, NO_x, CO, HCHO, H₂O₂, speciated PANs, speciated VOCs (online/offline) and meteorological parameters, including the preparation and use of different measurement platforms, e.g. ground-based and rooftop measurement sites, micrometeorological towers, airborne sondes, and aircraft. Participation in the NCAR PAN intercomparison experiment *PIE*. In collaboration with UNAM/Mexico City, performance of PAN and PPN measurements at the Paso de Cortes (4.000 m a.s.l) in the outflow of Mexico City – first continuous day- and nighttime PAN and PPN measurements at this altitude in this area. Airborne measurements along the US-Mexican border to study the impact of biomass burning plumes.

Coordination of the ground-based supersite of the TexAQS-II campaign on the campus of the University of Houston (about 50 scientists and 20 measurement groups). Lead of the “TexAQS-II Radical Measurement Project” (*TRAMP*). In addition, responsible for atmospheric sounding activities using radiosondes, ozone-sondes, a tether sonde system and aircraft missions for the determination of the spatial and temporal distribution of photochemically relevant trace gases during TexAQS-II. These studies addressed possible impacts of large scale transports and investigated boundary layer processes which are typically influenced by regional land sea breeze circulation and convective processes in the Houston-Galveston area. Major involvements in

the data analysis related to TRAMP and TexAQS-II. Member of various TexAQS-II Rapid Science Synthesis Working Groups.

Co-PI on the project “Study of Houston Atmospheric Radical Precursors (SHARP)” which investigates primary emissions of radical precursors HCHO and HONO. This includes potentially aerosol induced HONO emission by traffic sources as well as HONO emissions induced on different urban surfaces. Coordination of airborne measurements to investigate radical sources in the Houston area. In collaboration with Chalmers University/Göteborg, Sweden the project *SOF* applies solar occultation flux methods to investigate emissions of highly reactive hydrocarbons from industrial sources.

Supported by the US EPA implementation of a research grade ambient air measurement network in Houston consisting of 5 monitoring sites (*H-NET*).

Experimental research focus on HONO addresses traffic emissions in Houston and Santiago de Chile (the latter in collaboration with Universidad de Chile and Universität Wuppertal), and ozone related chemistry during wintertime in the upper Green River Basin, Wyoming. Participation in the project FIONA “Formal Intercomparison of Observations of Nitrous Acid” in the EUPHORE smog chamber in Valencia/Spain.

Research also includes application and validation of meteorological and air quality modeling using WRF-CMAQ. Studies for population exposures to 1,3-Butadiene in the Houston Metropolitan area using CMAQ. Initiated implementation of CMAQ 4.7, including enhanced HONO chemistry modules. Analysis of boundary layer and micrometeorological processes in WRF.

Founding member of Research Consortium (Atmospheric Chemistry of Siberia) together with Boris D. Belan (V.E. Zuev Institute of Atmospheric Optics, SB RAS, Tomsk, Russia) and Anatoly K. Golovko (Institute of Petroleum Chemistry SB RAS, Tomsk, Russia).

In 2013 I served as a Principle Investigator for the Qatar Environment and Energy Research Institute (QEERI) in Doha/Qatar and guided on the strategies in Air Quality research and on the implementation of Air Quality infrastructure completely funded by Qatar Foundation. First air quality analysis in the Middle East using ozonesondes including first WRF modeling.

Project funds come from a variety of sources, among them:

- Houston Advanced Research Center (HARC)
- Environmental Institute of Houston (EIH)
- Texas Air Research Center (TARC)
- Texas Commission on Environmental Quality (TCEQ)
- U.S. EPA
- Meteorological Solutions Inc. (MSI)
- Environ International
- NuHorizon
- National Center for Atmospheric Science (NCAR)
- European Union (EU)
- German Academic Exchange Service (DAAD)
- German Aerospace Center (DLR)
- various universities:
 - Baylor University (BU),
 - Valparaiso University (Valpo),
 - Universidad Nacional Autónoma de México (UNAM),
 - Universidad de Santiago de Chile (USACH)

During the time frame 2005-2019 Rappenglueck served as a PI on grants which totaled \$3.3 million. He was co-PI on additional grants of \$4.4 million. Sabbatical Leave 2013, Qatar Environment and Energy Research Institute (QEERI) in Doha/Qatar.

Institute for Meteorology and Climate Research, Atmospheric Environmental Research Section (IMK-IFU), Research Center Karlsruhe GmbH (FZK), Garmisch-Partenkirchen:

Focus of scientific work lies in the quantification of trace gas budgets and their dynamics in the atmosphere. These activities include the characterization of anthropogenic and biogenic sources, the determination of trace gas exchange processes, air quality studies in megacities and studies of trace gas distribution and long-range transport processes in the troposphere. Contributed to microscale studies of diffuse emissions sources at the airport of Zurich as well as to airborne measurements aimed at intercontinental transport studies during the CONTRACE and ICARTT-ITOP projects. Conducted air quality studies in Santiago de Chile. Responsible for micrometeorological studies related to biosphere-atmosphere exchanges in remote forest areas with a focus on relaxed-eddy-accumulation (REA) methods coupled to GC and PTR-MS for determining turbulent fluxes of biogenic VOC (*BEWA2000*). Another *BEWA2000* project focused on the design of a sampling device for carboxylic acids, degradation products of biogenic hydrocarbons.

Since 2004: Head of the Air Quality QA/QC-Group at the IMK-IFU for inorganic gas-phase compounds.

Since 2002: Head of the World Calibration Center for VOC (WCC-VOC) within the WMO-GAW program. Carried out worldwide VOC-intercomparison studies and first GAW station audits (*WCC-VOC*). Held courses and compiled course materials for personnel from worldwide Global Atmosphere Watch (GAW) stations at the, International GAW Training & Education Center (GAWTEC) of the WMO, Environmental Research Station Schneefernerhaus – UFS (lectures: “Chemistry and Emissions of VOCs”, “Sampling and Measurement Techniques of VOCs”, and “Quality Assurance of VOC measurements”). Since 2003 member of the Science Advisory Group for Reactive Gases (SAG-RG) of GAW

Chair of Bioclimatology and Air Pollution Research, Ludwig-Maximilians-Universität [LMU] (since 1999 Technische Universität München [TUM]), München

Since 1992: Establishment of VOC facilities / Head of VOC-Laboratory

Conducted extensive experimental research in the field of photochemical and meteorological processes in the troposphere. These investigations aimed at a better understanding of the impact of human activities upon atmospheric chemistry. A variety of studies focused on urban air quality issues (e.g. MEDPHOTRAC, MEDCAPHOT, CHILE-I, BERLIOZ) and were often related to human health aspects (e.g. KOVOX). The study of background ozone and its dependence on the chemical environment and radiation properties in remote areas was focus of the projects PAUR-I and PAUR-II. Also, biosphere-atmosphere interactions were studied, e.g. through contributions to the interdisciplinary project SFB607 and within the project ETWA focusing on forest trees that are exposed to stress ambient O₃ levels.

Apart from measurement techniques for ozone, nitrogen oxides, carbon monoxide and total VOC, measurement devices included different systems for PAN (GC/ECD, GC/Luminox) and up to 3 on-line VOC-GCs. Corresponding new laboratory facilities were implemented.

Field measurement campaigns were carried out within the framework of national and international projects, both in urban areas, e.g. Munich and Berlin/Germany, Athens/Greece and Santiago/Chile, and in rural areas, e.g. Alpine locations, mountainous regions in central Greece or on islands in the Greek Aegean Sea region (Aghios Efstratios, Crete). Within the campaigns usually a variety of scientific platforms were used, among them micrometeorological towers (SFB 607, ETWA), radio towers (Frohnau Tower, 324 m; BERLIOZ), cruising vessels (PAUR-II), cable-ways (OPAP) and a manned H₂ free balloon (BERLIOZ).

Teaching Experience

University of Houston (*in brackets number of students*)

Fall 2006 - Fall 2011: Atmospheric Science Graduate Advisor	
<i>Spring 2019:</i>	<i>Fall 2019 (scheduled):</i>
GEOL 3342 "Principles of Air Pollution" (27)	GEOL 1350 "Introduction to Meteorology" ¹⁾ (N/A) GEOL 1150 "Introduction to Meteorology Lab" ³⁾ (N/A) GEOL 6396 Seminar "Atmospheric Sciences" (N/A)
<i>Spring 2018:</i>	<i>Fall 2018:</i>
GEOL 6332 "Air Pollution Meteorology" ²⁾ (2) GEOL 4346 "Air Pollution Meteorology" ²⁾ (12)	GEOL 1350 "Introduction to Meteorology" ¹⁾ (172) GEOL 1150 "Introduction to Meteorology Lab" ³⁾ (47) GEOL 6326 "Remote Sensing for Atmospheric Science" ³⁾ (5) GEOL 6326 "Remote Sensing for Atmospheric Science -Lab" ³⁾ (5) GEOL 4348 "Remote Sensing for Atmospheric Science" ³⁾ (2) GEOL 4348 "Remote Sensing for Atmospheric Science Lab" ³⁾ (2)
<i>Spring 2017:</i>	<i>Fall 2017:</i>
GEOL 3342 "Principles of Air Pollution" (25) GEOL 3178 "Weather Information" (3)	GEOL 1350 "Introduction to Meteorology" ¹⁾ (217) GEOL 1150 "Introduction to Meteorology Lab" ³⁾ (59) GEOL 3178 "Weather Information" (5) GEOL 6396 Seminar "Atmospheric Sciences" (6)
<i>Spring 2016:</i>	<i>Fall 2016:</i>
GEOL 6332 "Air Pollution Meteorology" ²⁾ (1) GEOL 4346 "Air Pollution Meteorology" ²⁾ (17) GEOL 3178 "Weather Information" (5)	GEOL 1350 "Introduction to Meteorology" ¹⁾ (273) GEOL 1150 "Introduction to Meteorology Lab" ³⁾ (58) GEOL 6397 "Remote Sensing for Atmospheric Science" ³⁾ (5) GEOL 4397 "Remote Sensing for Atmospheric Science" ³⁾ (2) GEOL 3178 "Weather Information" (3)
<i>Spring 2015:</i>	<i>Fall 2015:</i>
GEOL 3342 "Principles of Air Pollution" (49) GEOL 6396 Seminar "Atmospheric Sciences" (8) GEOL 3178 "Weather Information" (7)	GEOL 1350 "Introduction to Meteorology" ¹⁾ (175) GEOL 1150 "Introduction to Meteorology Lab" ³⁾ (45) GEOL 3178 "Weather Information" (3)
<i>Spring 2014:</i>	<i>Fall 2014:</i>
GEOL 6336 "Boundary Layers and Turbulence" (4) GEOL 3381 "Micrometeorology" (9)	GEOL 6332 "Air Pollution Meteorology" ²⁾ (6) GEOL 4397 "Air Pollution Meteorology" ²⁾ (13) GEOL 1350 "Introduction to Meteorology" ¹⁾ (165) GEOL 1150 "Introduction to Meteorology Lab" ³⁾ (46) GEOL 3178 "Weather Information" (10)
<i>Spring - Fall 2013: Sabbatical Leave, Qatar Environment and Energy Research Institute, Doha/Qatar</i>	
<i>Spring 2012:</i>	<i>Fall 2012:</i>
GEOL 6336 "Boundary Layers and Turbulence" (4) GEOL 3381 "Micrometeorology" (3) GEOL 3178 "Weather Information" (10)	GEOL 1350 "Introduction to Meteorology" ¹⁾ (107) GEOL 1150 "Introduction to Meteorology Lab" ³⁾ (11) GEOL 3178 "Weather Information" (8)
<i>Spring 2011:</i>	<i>Fall 2011:</i>
GEOL 6332 "Air Pollution Meteorology" ²⁾ (3) GEOL 4397 "Air Quality Forecasting" ²⁾ (11) GEOL 3342 "Introduction to Air Pollution" (19) GEOL 3178 "Weather Information" (5)	GEOL 1350 "Introduction to Meteorology" ¹⁾ (129) GEOL 3178 "Weather Information" (8)
<i>Spring 2010:</i>	<i>Fall 2010:</i>
GEOL 6334 "Atmospheric Chemistry" (3) GEOL 6396 Seminar "Atmospheric Sciences" (5) GEOL 3382 "Atmospheric Chemistry" (7) GEOL 3178 "Weather Information" (5)	GEOL 6336 "Boundary Layers and Turbulence" ²⁾ (3) GEOL 3381 "Micrometeorology" ²⁾ (6) GEOL 1350 "Introduction to Meteorology" ¹⁾ (147) GEOL 3178 "Weather Information" (9)
<i>Spring 2009:</i>	<i>Fall 2009:</i>
GEOL 3342 "Introduction to Air Pollution" (13) GEOL 1350 "Introduction to Meteorology" ¹⁾ (150) GEOL 3178 "Weather Information" (7)	GEOL 3378 "Principles of Atmospheric Science" (36) GEOL 3178 "Weather Information" (8)

<i>Spring 2008:</i>	<i>Fall 2008:</i>
GEOL 3342 "Introduction to Air Pollution" (4) (co-taught with Dr. Byun) GEOL 1350 "Introduction to Meteorology" ¹⁾ (190) GEOL 3178 "Weather Information" (7)	GEOL 6397 "Atmospheric Chemistry" (6) GEOL 3382 "Atmospheric Chemistry" (5) GEOL 1350 "Introduction to Meteorology" (150) GEOL 3178 "Weather Information" (8)
<i>Spring 2007:</i>	<i>Fall 2007:</i>
GEOL 6334 "Air Pollution Chemistry & Physics" ²⁾ (4) GEOL 3382 "Atmospheric Chemistry" ²⁾ (4) GEOL 1350 "Introduction to Meteorology" (57) GEOL 3178 "Weather Information" (9)	GEOL 6379 "Integrated Biogeochemistry Studies" ³⁾ (4) GEOL 1350 "Introduction to Meteorology" ¹⁾ (109) GEOL 3178 "Weather Information" (10)
<i>Spring 2006:</i>	<i>Fall 2006:</i>
GEOL 3378 "Introduction to Atmos. Sciences" (34)	GEOL 3342 "Introduction to Air Pollution" (9) GEOL 1350 "Introduction to Meteorology" ¹⁾ (50) GEOL 3178 "Weather Information" (11)
<i>Summer 2006</i> GEOL 4398 "Data Analysis in Environmental Science" (4) (co-taught with Dr. Byun)	
<i>Spring 2005:</i>	<i>Fall 2005:</i>
GEOL 3342 "Introduction to Air Pollution" (8)	GEOL 3342 "Introduction to Air Pollution" (7) GEOL 6379 "Integrated Biogeochemistry Studies" ³⁾ (3)

¹⁾ Core Course since Fall 2006, ²⁾ Course in Graduate or Undergraduate Course Catalog, but taught first time, ³⁾ Entirely new courses.

Institute for Meteorology and Climate Research, Atmospheric Environmental Research Section (IMK-IFU),
Research Center Karlsruhe GmbH (FZK), Garmisch-Partenkirchen:

2002 – 2003, courses for Global Atmosphere Watch (GAW): "Chemistry and Emissions of VOCs", "Sampling and Measurement Techniques of VOCs", and "Quality Assurance of VOC measurements", International GAW Training & Education Center (GAWTEC) of the WMO

Munich University of Technology (TU Munich)

Winter Semester 1999/2000 and Winter Semester 2000/2001: Atmospheric Environmental Chemistry

Mentoring – Research Supervision / Group Members:

Undergraduates:

José Mojica (2006)	Provost's Undergraduate Research Scholarship (SURF), Summer 2006
Paulina Guerrero (2006)	
Leonardo Pedemonte (2006-2008)	
Rennee Boudreaux (2006-2007)	
Aaron Chow (2007)	
John Massingdale (2007-2008; 2010-2012)	
Mitul Patel (2007)	
Giovanna Croxatto (2008-2009)	Provost's Undergraduate Research Scholarship (PURS), Spring 2009
Luis Ackermann Nucete (2009-2011)	
Peter Nguyen (2010)	
Adam Spitzmueller (2010-2012)	
John Martinez (2012)	Alliance/Merck Science Hispanic Scholars Program Senior Project Summer and Fall 2016
Daniel Knez (2016)	Provost's Undergraduate Research Scholarship (SURF), Summer 2016
Marco Esteban Avendano (2015-2016)	Provost's Undergraduate Research Scholarship (PURS), Fall Semester 2016
Mina Song (2016-2017)	Senior Project Summer and Fall 2017
Mina Song (2016-2017)	
Linh Do (2016-2017)	
Anthony Der Tatevasion (2017)	
Juliana Tortato de Oliveira (2017)	
Alyssa Holler (since 2017)	Senior Project Fall 2018 and Spring 2019
John King (since 2019)	
Zain Akbar (since 2019)	
Chika Okoro (since 2019)	

Teaching Assistants:

Ryan Perna (2006-2007)	MS 2007
Monica Patel (2007-2008)	MS 2008
Marc Taylor (2008-2010)	MS 2010
Cari-Sue Wilmot (2010-2011)	MS 2013
Teresa Spohn (2012-2013)	MS 2013
Jaymason Shelton (2014-2016)	MS student; expected to graduate Spring 2019
Vanessa Caicedo (2015-2017)	PhD student
Olabosipo Osibanjo (since 2016)	PhD student

Research Assistants:

Richard Fuller (2005-2008; 2009-2011)	transferred to UH Dept. of Curriculum and Instruction
Bridget McEvoy-Day (2006-2008)	MS 2008
Cari-Sue Wilmot (2011)	MS 2013

Technicians:

Leonardo Pedemonte (2008-2011)	BS University of Houston
Giovanna Croxatto*) (2009-2011)	BS University of Houston

*) obtained MS degree in the European Master Program in Environmental Science at the University of Copenhagen/Denmark (2013)

Researcher:

Luis Ackermann*) (2012-2013)

*) now Research Associate with the Qatar Environment and Energy Research Institute (QEERI), Doha/Qatar

Primary Advisor MS Students:

Ryan Perna ¹⁾	MS 2007
Bridget McEvoy-Day ²⁾	MS 2008
Marc Taylor ³⁾	MS 2010
Cari-Sue Wilmot ⁴⁾	MS 2013
Teresa Spohn ⁵⁾	MS 2013
Michele Kocen ⁶⁾	MS 2013
Patrick Blood ⁷⁾	MS 2014
Luis Ackermann ⁸⁾	MS 2016
Jarrett Davidson	MS 2018
Jaymason Shelton	MS expected Fall 2019

¹⁾ now with Texas Commission on Air Quality (TCEQ), Houston/TX, ²⁾ now with Det Norske Veritas (DNV), Houston/TX, ³⁾ with TRC Solutions, Houston/TX, ⁴⁾ now with TechnoCycle, Houston/TX, ⁵⁾ now PhD student at National University of Ireland, Galway (Advisor Prof. Colin O'Dowd), ⁶⁾ now with ARES Corp., Houston/TX, TX, ⁷⁾ Meteorologist with NOAA, Houston, TX, ⁸⁾ Research Associate with Qatar Energy and Environment Research Institute (QEERI), Doha/Qatar

Primary Advisor PhD Students:

Kelly Soich ¹⁾ (completed Fall 2012) *)	<i>Forecast Vertical Velocity and Temperature, Horizontal Wind Direction and Wind Velocity Error Coupling within Upper Troposphere MM5 and WRF Forecasting</i>
Gustavo Cuchiara ²⁾ (completed Fall 2015)	<i>Simulating the evening transition in the PBL and evaluating its contribution to the next day prediction ozone peak concentration</i>
Vanessa Caicedo ³⁾ (completed Spring 2017)	<i>Investigating the temporal, seasonal, and spatial evolution of the atmospheric boundary layer using aerosol backscatter retrieval methods</i>
Olabosipo Osibanjo (planned 2020)	<i>Boundary Layer Properties and Implications on Air Quality in Mexico City</i>

¹⁾ Director of Programs, Chief Payload Specialist, Waypoint 2 Space, NASA Johnson Space Center, Houston/TX, ²⁾ now PostDoc at NCAR, Boulder, ³⁾ now PostDoc at Joint Center for Earth Systems Technology, University of Maryland, Baltimore, MD

Primary Supervisor PostDocs:

Dr. Michael Leuchner ¹⁾ (2006-2008)	DAAD Fellow, PhD TU München, Germany
Dr. Violeta Coarfa ²⁾ (2007-2008)	PhD University of Houston
Dr. Julia Golovko ³⁾ (2008-2013)	PhD Tomsk State University, Tomsk, Russia
Dr. Beata Czader ⁴⁾ (2009-2013)	PhD University of Houston
Dr. Fong Ngan ⁵⁾ (2009)	PhD University of Houston
Dr. Gustavo Cuchiara ⁶⁾ (2016-2017)	PhD University of Houston

¹⁾ now Publishing Editor, Springer, Dordrecht, Netherlands, ²⁾ now Teaching Faculty, Lone Star College and Houston Community College, Houston/TX, ³⁾ now DESC Engineer, Schlumberger, Houston/TX, ⁴⁾ now Research Scientist, Rice University, Houston, ⁵⁾ now Research Scientist, NOAA-ARL, College Park/MD, ⁶⁾ now PostDoc at NCAR, Boulder

Visiting Research Scholar:

Dr. In-Yong Eom*) (2009) PhD Texas Tech, Lubbock

*) now Faculty at Catholic University of Daegu, Dept. of Chemistry, Gyeongsan, South Korea

Research Faculty:

Dr. Peter Percell^{*)} (2009-2010)
Dr. Xiangshang Li (since 2009)

PhD University of California at Berkeley
PhD Tulane University

^{*)} retired since 2010, but still actively working

Awards:

José Mojica (2006)	Provost's Undergraduate Research Scholarship (SURF), Summer 2006
Bridget McEvoy-Day (2008)	Best Student Oral Presentation Award, 10 th Conf on Atmospheric Chemistry, Annual Meeting of the American Meteorological Society, New Orleans/LA, 20 - 24.01.2008
Giovanna Croxatto (2009)	Provost's Undergraduate Research Scholarship (PURS), Spring semester 2009
Giovanna Croxatto (2009)	Halliburton Excellence Award, May 2009
Cari-Sue Wilmot (2010)	Rice-Houston Alliance for Graduate Education and the Professoriate (AGEP), Summer Research Stipend, Summer 2010
Michael Leuchner, Bernhard Rappenglück (2010)	Paper "VOC Source-Receptor Relationships in Houston during TexAQSI-II, <i>Atmos. Environ.</i> , 44, 4056-4067, doi:10.1016/j.atmosenv.2009.02.029" among the most cited articles published in Atmospheric Environment in the time frame 2010-2011.
John Martinez (2012)	Alliance/Merck Science Hispanic Scholars Program
Gustavo Cuchiara (2012-2015)	PhD Scholarship from Brazilian national agency "Coordenação de Aperfeiçoamento de Pessoal de Nível Superior" ("Coordination of Improvement of Higher Education Personnel"; CAPES)
Cari-Sue Wilmot (2012)	Best oral presentation on Research Day of Department of Earth and Atmospheric Science
Gustavo Cuchiara (2012)	NSF support for participation in "Air Quality at the Interface: Mega Cities and Adjacent Agroecosystems", La Plata/Argentina August 8-16, 2012
Teresa Spohn (2013)	"Ozonesonde/radiosonde launches in summer 2013", Summer Research 2013 in Qatar, supported by the Qatar Environment and Energy Research Institute
Jaymason Shelton (2015)	Best poster (beginning graduate students) on Research Day of Department of Earth and Atmospheric Science
Jaymason Shelton (2015)	University of Houston NSM Alumni Association Award
Jaymason Shelton (2016)	Outstanding Graduate Teaching Assistant Award / Dept. of Earth and Atmospheric Science
Vanessa Caicedo (2016)	Best oral presentation on Research Day of Department of Earth and Atmospheric Science - Atmospheric Scientist Students
Marco Esteban Avendaño (2016)	UH Summer Undergrad. Research Fellowship 2016
Mina Song (2016)	Provost's Undergraduate Research Scholarship (PURS), Fall 2016

Olabosipo Osibanjo (2016-17) UH Presidential Fellowship
Olabosipo Osibanjo (2017) EAS Student Travel Award for Annual Meeting of the American Meteorological Society 2018
Olabosipo Osibanjo (2018) EAS Student Travel Award for Annual Meeting of the American Meteorological Society 2019

Member on other MS Committees:

Monica Patel (2008)	Dpt. of Geosciences	<i>A Case Study on the Local Wind Circulation and Its Role on Ozone Concentrations in the Houston-Galveston Area</i>
James Flynn (2009)	Dpt. of Earth and Atmospheric Sciences	<i>Impacts of clouds and aerosols on ozone photochemistry in southeast Texas</i>
Natalie Martin (2012)	Dpt. of Mechanical Engineering	<i>Accurate Modeling of the Neutral and Unstable Atmospheric Boundary Layer at Horns Rev using the k-ϵ Method in FLUENT 6.3</i>

Member on other PhD Committees:

Oscar Correa (2006)	Dpt. of Civil and Environmental Engineering	<i>Atmospheric Concentrations, Deposition and Modeling of Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans</i>
Craig Clements ^{†)} (2007)	Dpt. of Geosciences	<i>Experimental Studies of Fire-Atmosphere Interactions During Grass Fires</i>
Violeta Coarfa (2007)	Dpt. of Geosciences	<i>Air Quality Modeling of Aromatic Hydrocarbons in the Houston-Galveston Urban and Industrial Airshed</i>
Beata Czader (2007)	Dpt. of Geosciences	<i>Study of the Impact of VOCs on Ozone Formation under Houston-Galveston Atmospheric Conditions</i>
Fantine Ngan (2008)	Dpt. of Geosciences	<i>Classification of Weather Patterns and Improvement of Meteorological Inputs For Texas-II Air Quality Simulations</i>
Karl Pepple (2009)	Dpt. of Earth and Atmospheric Sciences	<i>Analysis of Mobile Emissions attributable to the University of Houston – For the Development of Strategic Sustainability Goals</i>
Dae-Gyun Lee (2009)	Dpt. of Earth and Atmospheric Sciences	<i>Retrospective Simulations of Ozone and Aerosols Utilizing the Improved Model Inputs from Global Model in-situ and Satellite Measurements</i>
Christine Haman (2011)	Dpt. of Earth and Atmospheric Sciences	<i>Impact of Synoptic Controls and Boundary Layer Processes on Ground-Level Ozone Evolution at an Urban Site</i>
Jingqian Wang (2012)	Dpt. of Earth and Atmospheric Sciences	<i>Investigation of the Tracer Gas Variability from Observations and Models</i>
Ankita Silva (2017)	Dept. of Pharmacological & Pharmaceutical Sciences	<i>Role of oxidative stress in simulated vehicle exhaust-induced behavioral & cognitive deficits in rats</i>
Shuai Pan (2017)	Dpt. of Earth and Atmospheric Sciences	<i>Impact of simulated ozone by improved meteorological factors such as Sea Surface Temperature, Cloud Fraction and sub-grid clouds</i>
Alex Kotsakis (2017)	Dpt. of Earth and Atmospheric Sciences	<i>Investigating the Impact of Meteorology on Ozone Variability in Houston, Texas</i>
Amir Sourì (2018)	Dpt. of Earth and Atmospheric Sciences	<i>Data assimilation for tropospheric chemistry modeling using airborne and geo-stationary remote sensing sensors</i>
Muqing Jin (planned 2019)	Dpt. of Physics	TBD
Camila Kochi (2020)	Dept. of Pharmacological & Pharmaceutical Sciences	<i>Stress susceptibility and vehicle exhaust pollution</i>

^{†)} since Fall 2007 Faculty at San José State University, Meteorology Department, San José/CA

Service and Affiliations

Member in Professional Organizations:

Deutsche Meteorologische Gesellschaft (DMG; 1992) - German Meteorological Society
American Meteorological Society (AMS; 1994)
Deutsche Physikalische Gesellschaft (DPG; 1996) - German Physical Society
American Chemical Society (ACS; 1999)
American Geophysical Union (AGU; 2001)

Manuscript Reviews (251)

Aerosol and Air Quality Research	Environmental Pollution
AIMS Environmental Science	Environment, Science & Pollution Research
Ain Shams Engineering Journal	Environmental Science & Technology
Air Quality, Atmosphere and Health	Fuel
Analytical Chemistry	Geophysical Research Letters
Annales Geophysicae	Geoscientific Model Development
Asia-Pacific Journal of Atmospheric Science	International Journal of Atmospheric Sciences
Atmósfera	International Journal of Environmental Analytical Chemistry
Atmosphere	International Scholarly Research Notices
Atmospheric Environment	ISRN Atmospheric Sciences
Atmospheric Chemistry and Physics	Journal of Arid Land
Atmospheric Measurement Techniques	Journal of Applied Meteorology
Atmospheric Pollution Research	Journal of Atmospheric and Solar-Terrestrial Physics
Atmospheric Research	Journal of Atmospheric Chemistry
Boreal Environment Research	Journal of Environmental Management
British Journal of App. Sci. & Techn.	Journal of Geophysical Research
Chemosphere	Journal of Hazardous Materials
Critical Reviews in Environ Sci & Technol.	Journal of King Saud University - Science
Elementa	Journal of the Air & Waste Management Association
Energy	Meteorologische Zeitschrift
Environmental Chemistry	Physical Geography
Environmental Health Insights	Proceedings of the National Academy of Sciences (PNAS)
Environmental Modeling and Assessment	Science of the Total Environment
Environmental Monitoring and Assessment	

Book Review

Hakim G., and Patoux J. (2016): Weather: A Concise Introduction

Book Proposal review:

Holloway T., and Levy II, Hiram (2018): Understanding Air Quality: Science and Policy

Proposal Reviews

National Science Foundation (NSF); Natural Environment Research Council (NERC) UK; L'Agence Nationale de la Recherche (ANR) - French National Research Agency; European Science Foundation (ESF); Chilean National Fund for Scientific and Technological Development (FONDECYT); NOAA - Atmospheric Chemistry, Carbon Cycle, & Climate (AC4); Research Grants Council (RGC) of Hong Kong; Der Wissenschaftsfond (FWF) - Austrian Science Fund, Deutsche Forschungsgemeinschaft (DFG) - German Research Foundation

Other Reviews

Health Effects Institute (HEI); John Simon Guggenheim Memorial Foundation; NASA Postdoctoral Program (NPP) and Ralph E. Powe Junior Faculty Awards on behalf of Oak Ridge Associated Universities (ORAU); Technology Foundation STW, Netherlands; Irish Research Council, Ireland

Member

Science Advisory Group for Reactive Gases of the World Meteorological Organization (WMO).

Peer Reviewed Publications

(h-index: 38; i10-index: 80; RG score: 38.85)

- 1) Mellqvist J., Offerle B., Samuelsson J., Johansson J., **Rappenglück B.**, Lefer B., Flynn J., Sullivan D. (2019): Emissions of methane and other VOCs from shale gas production in the Fort Worth area, *J. Geophys. Res.*, in preparation
- 2) Flynn J.H., Judd L.M., Stutz J., Luke W.T., Olson J.F., **Rappenglueck B.**, Lefer B. (2019): Temporal and seasonal variability of O₃ production in Houston, *J. Geophys. Res.*, in preparation
- 3) Hansen, R. F., Griffith S.M., Dusanter S., Gilman J., Graus M., Kuster W.C., Veres P., de Gouw J.A., Warneke C., Alvarez S.L., Flynn J.H., Grossberg N.E., Lefer B., **Rappenglueck B.**, Washenfelder R.A., Young C.J., Brown S.S., Stevens P.S. (2019): Measurements of Total OH reactivity during CalNex-LA 2010, *J. Geophys. Res.*, in preparation.
- 4) Osibanjo O.O., **Rappenglück B.**, Retama A., Jaimes-Palomera M. (2019): Estimating planetary boundary-layer height from microwave radiometer and radar observations and its application for an ozone episode in Mexico City, *Atmos. Env.*, submitted
- 5) Caicedo V., **Rappenglueck B.**, Cuchiara G., Flynn J., Ferrare R., Scarino A.J., Berkoff T., Senff C., Langford A., Lefer B. (2019): Bay and sea-breeze circulations impacts on the planetary boundary layer and air 1 quality from an observed and modeled DISCOVER-AQ Texas case study, *J. Geophys. Res.*, submitted.
- 6) Cai C., Avise J., Kaduwela A., DaMassa J., Warneke C., Gilman J., Kuster B., de Gouw J., Volkamer R., Stevens P., Lefer B., Holloway J.S., Pollack I., Ryerson T., Atlas E., Blake D., **Rappenglueck B.**, Brown S.S., Dube W.P. (2019): Simulating the weekly cycle of NO_x-VOC-HO_x-O₃ photochemical system in the South Coast of California during CalNex-2010 Campaign, *J. Geophys. Res.*, 124, DOI: 10.1029/2018JD029859
- 7) Cuchiara G.C., **Rappenglück B.** (2019): Simulating the influence of convective decay parameterization for a case study in Houston, TX, *Atmos. Env.*, 204, 68-77, <https://doi.org/10.1016/j.atmosenv.2019.02.016>
- 8) Li X., **Rappenglück B.** (2018): A Study of Model Nighttime Ozone Bias in Air Quality Modeling, *Atmos. Env.*, 195, 210-228, doi: 10.1016/j.atmosenv.2018.09.046
- 9) Cuchiara G.C., **Rappenglück B.** (2018): Performance analysis of WRF and LES in describing the evolution and structure of the Planetary Boundary Layer, *Environ. Fluid. Mech.*, <https://doi.org/10.1007/s10652-018-9597-5>
- 10) De Gouw J.A., Gilman J.B., Kim S.-W., Alvarez S.L., Dusanter S., Graus M., Griffith S.M., Isaacman-Van Wertz G., Kuster W.C., Lefer B.L., Lerner B.M., McDonald B.C., **Rappenglueck B.**, Roberts J.M., Stevens P.S., Stutz J., Veres P.R., Volkamer R., Warneke C., Washenfelder R.A. (2018): Chemistry of Volatile Organic Compounds in the Los Angeles Basin: Formation of Oxygenated Compounds and Determination of Emission Ratios, *J. Geophys. Res.*, 123, DOI: 10.1002/2017JD027976
- 11) Cuchiara G.C., **Rappenglück B.**, Rubio A.M., Lissi E., Gramsch E., Garreaud R.D. (2017): Modeling Study of Biomass Burning Plumes and their Impact on Urban Air Quality; A Case Study of Santiago de Chile, *Atmos. Env.*, 166, 79-19, doi: 10.1016/j.atmosenv.2017.07.002
- 12) Zhu L., Jacob D.J., Keutsch F.N., Mickley L.J., Scheffe R., Strum M., González Abad G., Chance K., Yang K., **Rappenglück B.**, Millet D.B., Baasandorj M., Jaeglé L., Shah V. (2017): Formaldehyde (HCHO) as a Hazardous Air Pollutant: Mapping sur-face air concentrations from satellite and inferring cancer risks in the United States, *Environ. Sci. Technol.*, doi: 10.1021/acs.est.7b01356
- 13) Cuchiara G.C., **Rappenglück B.** (2017): Single-Column Model and Large Eddy Simulation of the Evening Transition in the Planetary Boundary Layer, *Environ. Fluid. Mech.*, 17, 777-798, doi:10.1007/s10652-017-9518-z
- 14) Caicedo V., **Rappenglueck B.**, Lefer B., Morris G., Toledo D., Delgado R. (2017): Comparison of aerosol LIDAR retrieval methods for boundary layer height detection using ceilometer backscatter data, *Atmos. Meas. Tech.*, doi:10.5194/amt-10-1609-2017
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- 2) **Rappenglück B.**, Holler A. (2019): Analysis of a 15-Year Time Series of C2-C11 Non-Methane Hydrocarbons in a Subtropical Area: Interannual Variability and Trends, *15th International Conference on Atmospheric Sciences and Application to Air Quality*, Kuala Lumpur/Malaysia, 28.-30.10.2019.
- 3) Nault B.A., Jo D.S., Campuzano-Jost P., Day D.A., Hu W., Schroder J.C., Allan J., Bandy B., Blake D.R., Canagaratna M.R., Coe H., DeCarlo P.F., Diskin G.S., Flocke F., Fried A., Gilman J.B., Hanisco T.F., Hayes P.L., Henze D., Hopkins J., Huey L.G., Jobson B.T., Kuster W.C., Lee J., Liao J., Mills G., Montzka D.D., Pollack I.B., Peischl J., **Rappenglück B.**, Roberts J.M., Ryerson T.B., Stutz J., Weibring P., Weinheimer A.J., Williams E.J., Wood E.C., Young D.E., Yuan B., de Gouw J.A., and Jimenez J.L. (2019): Variable Urban SOA Production Explained by Emissions and Photochemistry to Quantify of its Impact on Mortality, *Gordon Research Conference for Atmospheric Chemistry*, 07.28-08.20.2019, Newry ME/USA
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- AMS Annual Meeting 2014: Session "Biomass Burning Impacts on Air Quality" (together with Timothy Vanreken)
- 12th ASAAQ (Int. Conf. on Atmospheric Science and Applications to Air Quality) 2013, Seoul/South Korea: Session "Atmospheric Chemistry & Physics"
- AMS Annual Meeting 2012: Session "Atmospheric Field Campaigns III" (together with Nicole Mölders)
- AMS Annual Meeting 2011: Session "Field and modeling studies from Recent Field Campaigns: SHARP 2009 and CalNex 2010" (together with Sylvain Ménard)
- AMS Annual Meeting 2010: Session "The Study of Houston Atmospheric Radical Precursors (SHARP) – II" (together with Jochen Stutz)
- AMS Annual Meeting 2010: Session "The Study of Houston Atmospheric Radical Precursors (SHARP) - III" (together with Renyi Zhang)
- AMS Annual Meeting 2009: Session "Air quality and climate change, Part III" (together with Wallace McMillan)
- AGU Fall Meeting 2007: Session "Day and nighttime chemical processing in polluted atmospheres"; Focus: TexAQS-II und MI-LAGRO (together with Scott Herndon)

Editor

- Special Issue in *Atmosphere* (2018-19) titled "Trace Gas Budgets in Urban and Remote Areas"
- Special Issue in *Atmosphere* (2016-17) titled "Tropospheric Ozone and Its Precursors"
- Associate Editor, *Air Quality, Atmosphere & Health (AQAH)* (since 2016)
- Editorial board member for *AIMS Environmental Science* (since 2015)
- Editorial board member for *Austin Journal of Earth Science* (since 2014)
- Editorial board member for *IJAS Atmospheric Sciences* (2012-2017)
- Editorial board member for *ISRN Atmospheric Sciences* (2012-2014)
- Special Issue in *Atmospheric Environment* (2010) titled "The TexAQS II Radical and Aerosol Measurement Project (TRAMP)" (together with Barry Lefter)

Invited Talks

- 1) Rappenglück B. (2019): The Planetary Boundary Layer and Urban Air Quality *University of Houston/Center for Thermo-Fluid Mechanics – Houston/TX*, 22.03.2019.
- 2) Li X., Rappenglück B. (2018): Nighttime Ozone Bias and Vertical Diffusion in Air Quality Modeling in Southeast Texas, *Texas Air Quality Meeting, University of Texas – Austin/TX*, 06.04.2018.
- 3) Cuchiara G., Rappenglück B. (2017): Impact of PBL parameterization on predictions of ozone, *Tropospheric Chemistry meeting/colloquium (ACOM/NCAR) – Boulder/CO*, 27.10.2017.
- 4) Li X., Rappenglück B. (2015): Improved Meteorological Modeling for Houston Air Quality Studies, *Texas Air Quality Meeting, University of Texas – Austin/TX*, 10.04.2015.
- 5) Rappenglück B. (2015): Air Pollution and its Impact on the Environment, *Texas Southern University, Houston/TX*, 22.04.2015

- 6) Rappenglück B. (2015): Modeling of 1,3-Butadiene in Urban and Industrial Areas, *Coordinating Research Council, Sacramento/CA*, 19.02.2015
- 7) Rappenglück B. (2015): Radical Precursors and Related Species from Traffic as Observed and Modeled at an Urban Highway Junction, *Mid-Atlantic Regional Air Management Assoc. (MARAMA)-webinar, Towson/MD*, 28.01.2015
- 8) Rappenglück B. (2014): Analysis of 10 Years online C₂-C₁₁ NMHC Measurements close to the Gulf of Mexico, *invited talk*, 5th WMO/GAW expert meeting on global observations of VOCs, *World Meteorological Organization, Daejeon/Korea*, 20.10.2014
- 9) Rappenglück B. (2014): Air Quality Aspects in the Arabian Gulf Area, *invited talk*, *Biological & Agricultural Engineering Department, Texas A&M, College Station/Texas*, 01.10.2014
- 10) Rappenglück B. (2014): Unos Aspectos de La Calidad del Aire, *invited talk*, *Universidad Nacional de San Antonio Abad del Cuzco, Cusco/Peru*, 09.07.2104
- 11) Rappenglück B. (2013): Air Quality Research in Qatar, *invited talk*, *Qatar University Life Science Symposium (QULSS 2013), Doha/Qatar*, 10.12.2013
- 12) Rappenglück B. (2013): Urban Climate and Air Quality, *invited talk*, *Faculty of Civil, Geo and Environmental Engineering, Munich University of Technology, Munich/Germany*, 17.04.2013
- 13) Rappenglück B. (2013): Strategies for Atmospheric Research in Qatar, *invited talk*, *Qatar Environment and Energy Research Institute (QEERI), Doha/Qatar*, 12.03.2013
- 14) Rappenglück B. (2012): Long-term online C₂-C₁₁ VOC Measurements in a Subtropical Area close to the Gulf of Mexico, *invited talk*, 4th WMO/GAW expert meeting on global observations of VOCs, *World Meteorological Organization, York/UK*, 11.09.2012
- 15) Rappenglück B. (2012): Air Quality in Urban Areas – What are the Important Challenges?, *invited talk*, *Qatar Clean Air Research Workshop, Doha/Qatar*, 23.04.2012
- 16) Rappenglück B. (2012): Air Quality Research in Houston, Texas - Results from Observations and Modeling Studies, *invited talk*, *Qatar Environment and Energy Research Institute (QEERI), Doha/Qatar*, 15.02.2012
- 17) Rappenglück B. (2010): Urban Climate and Air Pollution - Example Houston, Texas, *invited talk*, *Faculty of Civil Engineering and Geodesy, Munich University of Technology, Munich/Germany*, 20.07.2010
- 18) Rappenglück B. (2010): Analysis of in-situ VOC data in a subtropical area close to the Gulf of Mexico, *invited talk*, 3rd WMO/GAW expert meeting on global observations of VOCs, *World Meteorological Organization, Helsinki/Finland*, 29.06.2010
- 19) Rappenglück B. (2010): Overview of Meteorology and Chemistry Measurements during SHARP, *invited talk*, *Annenberg Presidential Center, Texas A&M University, College Station/Texas*, 23.04.2010
- 20) Rappenglück B. (2009): Formaldehyde (HCHO) and Nitrous Acid (HONO) in the Houston Atmosphere, *invited seminar lecture*, *Department of Civil and Environmental Engineering, University of Houston, Houston/Texas*, 22.09.2009
- 21) Rappenglück B. (2008): El Cambio Climático y América Latina, *invited talk*, *Gobierno Regional Cusco, Cusco/Perú*, 16.10.2008
- 22) Rappenglück B. (2008): The Application of an Urban online VOC Network for GAW Objectives, *invited talk*, *GAW-VOC/CCQM-GAWG Workshop, World Meteorological Organization, Dübendorf/Switzerland*, 08.07.2008
- 23) Rappenglück B. (2007): University of Houston Field Campaign Activities in Support of TexAQs-II in 2006, *invited seminar lecture*, *Harvard University, Cambridge MA/USA*, 09.02.2007
- 24) Rappenglück B. (2006): Organic Compounds and their role in Atmospheric Chemistry (in German), *invited seminar lecture*, *Johann Wolfgang Goethe University, Frankfurt am Main/Germany*, 15.12.2006
- 25) Rappenglück B. (2006): Peroxyacetylnitrates (PANs) in the Atmosphere (in Spanish), *invited seminar lecture*, *Centro de Ciencias de la Atmósfera - Universidad Nacional Autónoma de México (UNAM), Mexico City/Mexico*, 19.05.2006
- 26) Rappenglück B. (2006): The 1st GAW VOC Intercomparison, *invited talk*, *World Meteorological Organization, Geneva/Switzerland*, 30.01.2006
- 27) Rappenglück B. (2005): VOCs and their relation to Ozone, PAN, and Secondary Organic Aerosols in the Urban Plume of Santiago de Chile, *invited seminar lecture*, *Texas A & M University, College Station TX/USA*, 15.04.2005
- 28) Rappenglück B. (2004): Results from air quality studies in Santiago de Chile, *invited seminar lecture*, *Department of Geosciences – University of Houston, Houston TX/USA*, 29.04.2004
- 29) Rappenglück B. (2003): Biogenically emitted oxygenated compounds – do they indicate plant stress? (in German), *invited lecture*, *Science Center Weihenstephan, Technical University of Munich, Freising-Weihenstephan/ Germany*, 29.10.2003
- 30) Rappenglück B. (2002): Interactions Between Vegetation and Atmosphere – a Focus in Ecoclimatology (in German), *invited lecture*, *Department of Ecology, Technical University of Munich, Freising-Weihenstephan/ Germany*, 15.11.2002
- 31) Rappenglück B. (2002): Some Aspects of Urban Air Quality Studies (in Spanish), *invited lecture*, *CONAMA R.M./GTZ, Santiago de Chile*, 06.11.2002
- 32) Rappenglück B. (2000): Ambient Air Contamination (in Spanish), *invited lecture* at the Municipality of Cuzco, 31.10.2000, Cuzco, Perú
- 33) Rappenglück B. (2000): Photochemical Smog (in Spanish), *invited lecture* at the 5th Workshop of the Initiative of Clean Air for Latin American Cities organized by the Government of the Metropolitan Region of Santiago, the World Bank, and CONAMA R.M., 25.10.2000, Santiago de Chile
- 34) Rappenglück B. (1998): NMHC measurements in selected urban areas using on-line gas chromatography - Case studies: Munich/Germany, Athens/Greece and Santiago de Chile, *invited seminar lecture*, *National Oceanic and Atmospheric Administration (NOAA) - Environmental Research Laboratories - Aeronomy Laboratory, Boulder CO/USA*, 16.11.1998
- 35) Rappenglück B. (1994): Aromatic hydrocarbons - What is their contribution to the formation of ozone and PAN? (in German), *invited lecture* in the Course of the Leipzig Meteorological Colloquium, *Institute for Tropospheric Research (IFI), Leipzig/Germany*, 07.07.1994