The Center for Aerosol Science & Engineering (CASE) at Washington University in St. Louis is focused on the advancement of science and technology of aerosol systems. CASE works to characterize fundamental aerosol formation and transformation processes to determine impacts on the environment, climate, and human health; and to utilize these processes to develop new materials to enable energy, environmental & medical technologies. The center is composed of a collaborative group of faculty, students, and affiliates within the department of EECE and across the university, as well as partners in universities and corporations across the globe. CASE activities include extensive collaborative research with shared instrumentation facilities, education through coordinated coursework and workshops, seminars and discussion groups, and social networking events.

### Core faculty

<table>
<thead>
<tr>
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<th>Title/Position</th>
<th>Email</th>
<th>LinkedIn Profile</th>
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<td>PhD, 1988, University of California</td>
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<tr>
<td></td>
<td>Nanoparticle Synthesis, Combustion Aerosols; Clean Energy, LACER Lab</td>
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<td></td>
<td>PhD, 1985, California Institute of Technology</td>
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<tr>
<td></td>
<td>Chair, Combustion Aerosols, Air Quality and Pollution Control, Nanotechnology, Environmentally Benign Energy Production; AAQRL Lab</td>
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<td></td>
<td>PhD, 2008, University of Nevada-Reno</td>
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<tr>
<td></td>
<td>Energy, Atmospheric aerosols and radiative forcing; aerosol formation and engineering; AIR Lab</td>
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<td>PhD, 1970, University of Minnesota</td>
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<tr>
<td></td>
<td>Center for Air Pollution and Trends Analysis Information Systems for Air Quality Management; CAPITA Lab</td>
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<td>Elijah Thimsen</td>
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<td></td>
<td>PhD, 2009, Washington University in St. Louis</td>
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<tr>
<td></td>
<td>Energy, Advanced gas-phase synthesis of nanomaterials for energy applications; Interface Research Group Lab</td>
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<td>Jay R. Turner</td>
<td>Associate Professor</td>
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<td>DSc, 1993, Washington University in St. Louis</td>
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<tr>
<td></td>
<td>Air Quality Management, Air Pollution Characterization &amp; Control; The Jay Turner Lab</td>
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<td>Brent Williams</td>
<td>Raymond Tucker Career Development Associate Professor</td>
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<tr>
<td></td>
<td>PhD, 2008, University of California, Berkeley</td>
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<tr>
<td></td>
<td>Composition and Chemistry of the Atmosphere, Biogenic and Anthropogenic Gases and Particles; ACT Lab</td>
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### AFFILIATED FACULTY

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<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Su Huang</td>
<td>(EECE)</td>
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<td>Benjamin Kumfer</td>
<td>(EECE)</td>
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<td>Tianxiang Li</td>
<td>(EECE)</td>
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<tr>
<td>Grigoriy Yablonsky</td>
<td>(EECE)</td>
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### RESEARCH FACULTY

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<tr>
<td>Samuel Achilefu</td>
<td>(School of Medicine)</td>
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<tr>
<td>Raymond Arvidson</td>
<td>(Earth &amp; Planetary Sciences)</td>
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<tr>
<td>Hilary Babcock</td>
<td>(School of Medicine)</td>
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<tr>
<td>John Fortner</td>
<td>(EECE)</td>
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<td>Young-Shin Jun</td>
<td>(EECE)</td>
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<tr>
<td>Vijay Ramani</td>
<td>(EECE)</td>
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<tr>
<td>Srikanth Singamaneni</td>
<td>(Mechanical Engineering &amp; Materials Science)</td>
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<tr>
<td>Lan Yang</td>
<td>(Electrical &amp; Systems Engineering)</td>
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</table>
CASE partner universities

St. Louis, MO
- Washington University
- Bogazici University

Istanbul, Turkey
- National University of Singapore — B. Rajasekhar, J. Yu
- Chulalongkorn University — A. Suriyawong
- Seoul National University — M. Choi
- Yonsei University — T.G. Lee, J. Jeong
- Tsinghua University — J. Hao, J. Jiang, Y. Wu, S. Wang, S. Li, Q. Yao
- Peking University — M. Hu
- China Agricultural University — R. Dong, Y. Zhou
- Fudan University — Y. Zhang, J. Chen
- Hong Kong University of Science and Technology — I. Lo
- IIT Bombay — C. Venkataman, V. Sethi
- Technion — G. Grader, M. Shapiro
- Bogazici — O. Yenigun
- National Chiao Tung University — H. Bai, C.J. Tsai

State-of-the-art aerosol research laboratories

Aerosol and Air Quality Research Lab (AAQRL) (aerosols.eece.wustl.edu)

The Aerosol and Air Quality Research Laboratory (AAQRL) focus is on research and education related to particulates in gaseous suspension, known as aerosols. AAQRL’s contributions to this field span the full process of technology development, from synthesis and characterization to eventual application. Through this research, we aim to mitigate the negative impacts of aerosols on the environment and leverage their potential as nanoparticles for application in energy, environment, medicine and agriculture.

Atmospheric Chemistry and Technology Lab (ACT) (actlab.seas.wustl.edu)

Through novel laboratory and field measurements, ACT works to determine the sources, composition, transformation, and fate of atmospheric biogenic and anthropogenic organic gases and particles, which are detrimental to human health, affect the hydrological cycle, and affect the Earth’s energy balance.

Aerosol Impacts & Research Lab (AIR) (air.eece.wustl.edu)

Investigating the role of atmospheric aerosols in earth’s energy balance using novel instrumentation and diagnostic techniques, and numerical models, and understanding aerosol formation in combustion systems toward synthesis of high porosity and surface-area materials for energy applications.

Interface Research Group (sites.wustl.edu/irg1)

Interface Research Group studies systems in which interfaces play a central role. Specifically, focus is on thin films and nanostructured materials.
State-of-the-art aerosol research laboratories

Laboratory for Advanced Combustion & Energy Research (LACER) (wulacer.com)

LACER develops approaches to synthesize advanced materials for electrical vehicles, conducts fundamental studies of combustion, studies combustion of renewable fuels, and develops novel approaches to reduce emissions from power plants. LACER has advanced large scale facilities for combustion research.

The Jay Turner Lab (users.seas.wustl.edu/jrturner)

The Jay Turner Lab focuses on air quality characterization with emphasis on field measurements and data analysis to support a variety of applications in the atmospheric science, regulation and policy, and health studies arenas. One thrust, with projects in both the United States and abroad, is research to inform air quality planning and management.

Affiliated centers

McDonnell Academy
Global Energy and Environment Partnership (MAGEEP)
mageep.wustl.edu

Consortium for Clean Coal Utilization (CCCU)
cccu.wustl.edu

Solar Energy and Energy Storage (SEES)
solarstorage.wustl.edu

International Center for Energy and Sustainability (InCEES)
inces.wustl.edu

National & International Organizations

American Association for Aerosol Research

International Aerosol Research Assembly

European Aerosol Assembly (EAA)

CASE Student Chapter

The CASE Student Chapter works to support our parent center and coordinate its student focused activities. Our membership includes over 35 graduate students in energy, environment, materials, health and other areas of applied research. Our foremost goal is to help advance the research, educational and professional goals for aerosol science students at WashU. To that end, we organize technical workshops and lectures to help students develop skills in practical or advanced topics not necessarily taught in a classroom. We also hold monthly happy hours where faculty members discuss topics ranging from their professional journeys to the history of aerosol science to recent events related to aerosols and related fields. Occasionally, WashU hosts seminars or workshops by leading aerosol scientists from across the world; the CASE student chapter facilitates informal meetings between the visitors and students interested in their research. Another goal of our organization is to increase the capabilities and presence of aerosol research at WashU, in affiliation with other graduate student bodies on WashU as well as with nationally recognized organizations in the field of aerosol science. We serve as the WashU chapter for the American Association of Aerosol Research (AAAR), and are working to use AAAR conferences as a platform for encouraging more connectivity with our alumni.

CURRENT PHD STUDENTS

Ahmed Abokifa
Adewale Adesosun
Jiung-Wen Chen
Audrey Dang
Sukran Dhaswan
Claire Fortenberry
Akshay Gopan
Kelsey Haddad
Phillip Johnson
SungHee Jung
Clayton Kacica
Bedia Karakocak
Shalinee Kavaidya
Dishant Khatri
Jieyu Li
Zhichao Li
Pai Liu
Jose Madore Munoz
Yao Nie
Pradeep Sivaprabha Prathibha

Bedia Karakocak
Shalinee Kavaidya
Dishant Khatri
Jieyu Li
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Girish Sharma
Kuan-Yu Shen
Nieht Jaideep Shetty
Benjamin Sumlin
Yuansi Sun
Che Tan
Necip Uner
Piyush Kumar Verma
Michael Walker
Yang Wang

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Yuli Heinson
David Stokie
Zhiwei Yang

Ray Ehrhard
Yanjie Hu
Ramesh Raliya
Xuebin Wang
Liang-Yi Yin

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Ahmed Abokifa
Adewale Adesosun
Jiung-Wen Chen
Audrey Dang
Sukran Dhaswan
Claire Fortenberry
Akshay Gopan
Kelsey Haddad
Phillip Johnson
SungHee Jung
Clayton Kacica
Bedia Karakocak
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Dishant Khatri
Jieyu Li
Zhichao Li
Pai Liu
Jose Madore Munoz
Yao Nie
Pradeep Sivaprabha Prathibha

Nathan Reed
Girish Sharma
Kuan-Yu Shen
Nieht Jaideep Shetty
Benjamin Sumlin
Yuansi Sun
Che Tan
Necip Uner
Piyush Kumar Verma
Michael Walker
Yang Wang
2016 publications


Christopher Hogan, PhD

Benjamin Mayhugh Associate Professor and McKnight Land-Grant Professor, University of Minnesota College of Science & Engineering

Hogan’s lab at Minnesota focuses on the fundamentals of the physics and chemistry of very small particles in the gas phase, called aerosol nanoparticles. While application is secondary to his research, potential applications include new particle formation in the atmosphere, combustion emissions or materials synthesis in high temperature reactors.

While a doctoral student at Washington University, Pratim Biswas was Hogan’s adviser, but he also worked with Michael Gross, professor of chemistry. He credits both of them with influencing him to go into academic research. Hogan had 22 refereed journal publications from his PhD work at CASE in Washington University in St Louis.

Melissa Holtmeyer, PhD

AAAS Science and Technology Policy Fellow, U.S. Department of Defense

Melissa Holtmeyer has helped shape the direction of national science and technology policy through her opportunities as an American Association for the Advancement of Science (AAAS) Science and Technology policy fellow in both the U.S. Senate and the U.S. Department of Defense, where she is currently performing the duties of the deputy director for Energy Security in the Office of the Secretary of Defense.

Using her engineering background, she advised senators and congressional staffers on energy, environment and climate change legislation. At the DoD, she is helping to develop plans to reduce military fuel use, ensure secure fuel supplies for global operations and provide technical expertise on next-generation DoD technologies to military leaders.

While her background in fundamental combustion has been drawn upon many times, her communication and writing skills, approach to solving problems and ability to understand highly technical topics have been valued assets and respected by high-level leaders. Holtmeyer worked with Professor Axelbaum for her PhD.