

Name of nominee:	Hope A. Michelsen
DOB (optional):	
Work affiliation (or high school for youth):	Sandia National Laboratories
Position:	Distinguished Member of the Technical Staff
Business/school address/ZIP (Do not use PO Box):	7011 East Avenue, MS 9055, Livermore, CA 94551
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Name of person(s) or group making nomination:	Thomas B. Settersten
Address/ZIP (Do not use PO Box):	7011 East Avenue, MS 9055, Livermore, CA 94551
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Category: Science

1. List experience in a ~~volunteer and/or~~ professional position worthy of a nomination relating to the selected category. (155 words)

Dr. Hope Michelsen is a Distinguished Staff Scientist at the Combustion Research Facility (CRF) at Sandia National Laboratories (SNL) in Livermore. Dr. Michelsen is a recognized international expert in the fields of soot detection, stratospheric chemistry and transport, and greenhouse gas source attribution. Her projects include both experimental and modeling studies and span a wide range of disciplines, including combustion diagnostics, soot-formation chemistry, stratospheric chemistry and transport, satellite validation, climate change, atmospheric particle detection, and greenhouse gas measurements. She has published over 90 book chapters and peer-reviewed scientific articles that have been cited by other scientists over 3600 times. In addition to her individual excellence in science, Dr. Michelsen demonstrates outstanding teamwork, having served on 6 satellite and aircraft mission science teams, 1 international assessment panel, 3 multi-lab projects related to climate modeling, climate measurements, and greenhouse gas (GHG) monitoring, and a Committee of Visitors for the Department of Energy, Office of Basic Energy Sciences.

2. Describe three (3) major achievements of the nominee. For example, include whether the nominee started a new program or used new methods to solve problems and/or initiate activities, whether the nominee accomplished desired results, and the impact or difference the nominee's achievements made in the community. (229 words)

Dr. Michelsen leads the CRF's Particulate Diagnostics Program, primarily focusing on combustion-generated particulate matter (soot), which has significant negative health risks and major climatic impact. Hope built a world-class experimental facility at Sandia to pursue the development of advanced capabilities to address the fundamental scientific questions associated with the chemistry of soot formation. Her detailed experiments on the most widely used soot measurement technique, laser-induced incandescence (LII), have addressed subtle, yet critical, gaps in the accepted understanding of the chemical and physical processes controlling LII. The results of her work are enabling accurate soot characterization.

Hope established a leading role in the development of methods for characterizing GHG sources for climate treaty verification and policy support. Her innovative approach combines measurement of key GHG and other chemical tracers, meteorological data, and transport modeling to provide attribution of greenhouse gas emissions, including emissions sector information.

As part of a tri-lab project on climate involving the Sandia, Lawrence Livermore National Laboratory (LLNL), and Los Alamos National Laboratory, Hope developed and deployed the Atmospheric and Terrestrial Mobile Laboratory (ATML). This laboratory provides unique capabilities for in-situ atmospheric measurements to provide the key information necessary to understand biogenic and anthropogenic greenhouse gas emissions. After leading a successful field campaign at the DOE Southern Great Plains site, Hope is now operating the ATML in the Bay Area in support of her GHG attribution program.

3. Identify what distinguishes the nominee from her peers/colleagues. For example, did the nominee have to overcome unusual challenges such as physical or mental handicaps, limited resources, public perception, etc... (249 words):

Unlike many scientists of today, Hope has switched research fields several times, bringing new insights along the way and contributing at the highest levels. Hope's publication record speaks directly to her impact in these fields. In many cases, Hope has challenged the conventional wisdom of a field, presenting controversial results and/or interpretation of data. Her meticulous attention to detail and keen scientific insight have allowed her to stand up to significant initial resistance, and to ultimately reshape our scientific understanding.

Hope has had to work through many anticipated obstacles faced by all investigators developing new approaches in an established scientific field. Because her chosen field fell within the physical sciences that were overwhelmingly male-dominated, however, she also faced gender bias that younger women can often barely fathom. She nonetheless reached a high level of professional accomplishment without resorting to the aggressive behavior she so often faced or insulating herself from the establishment. As a result she has served as a role model for younger professionals. Going beyond her more comfortable professional activities, she has worked to cultivate the inclusive work environment that she wished had existed when she was starting out. Her efforts have led to substantial changes at SNL that benefit a wide swath of employees, most of whom live in Alameda County.

Hope is also an accomplished Yoga practitioner and instructor. She formed a free yoga class 5 years ago for the communities at LLNL and SNL and continues to volunteer as a yoga instructor twice weekly.
