Exponent®
Engineering & Scientific Consulting

Charles Owens, Ph.D.
Associate | Thermal Sciences
Irvine
+1-949-242-6032 | cowens@exponent.com

Professional Profile

Dr. Owens is a thermal science expert with a Ph.D. degree in Mechanical and Aerospace Engineering. He offers extensive expertise in thermal/fluid analysis, thermofluidic modeling, and additive manufacturing techniques, applying these skills to complex engineering challenges for clients across the aerospace, energy, and manufacturing industry sectors. His technical background includes advanced simulation and experimental work on cryogenic hydrogen storage, active metamaterials, and 3D/4D printing of thermal control devices.

Prior to Exponent, Dr. Owens worked in the HIER lab at UC Irvine, collaborating with a variety of clients, including government, industry, and academia, on projects ranging from the 3D/4D manufacturing of thermal devices for applications in lunar habitats to designing baffle configurations aimed at reducing heat ingress into liquid hydrogen tanks. Prior to his tenure at UC Irvine, he served as a production engineer in the oil and gas industry, where he applied solutions to decreased productivity relating to manufacturing process of elastomer parts as well as machine downtime, and he was responsible for the implementation of key elements of Lean, such as Kaizen/5S workouts.

His contributions to science and engineering have resulted in multiple peer-reviewed publications and conference presentations, demonstrating his commitment to advancing the field and delivering value to clients.

Academic Credentials & Professional Honors

Ph.D., Mechanical and Aerospace Engineering, University of California, Irvine, 2025

M.S., Mechanical Engineering, University of Southern California, 2017

M.A., Finance, Claremont McKenna College, 2015

B.A., Physics, Pomona College, 2014

Samueli Endowed Fellowship (2020)

Chevron Corporation University Partnership Program Fellowship in Energy Resources (2015)

Associate Member of Sigma Xi, the Scientific Research Society (2014)

Rose Hills Foundation Summer Science and Engineering Research Fellowship (2013)

Prior Experience

Naval Research Enterprise Intern, US Navy, 2022

Production Engineer, Schlumberger, 2019-2020

Publications

Owens C, et al. Analytical and numerical modeling of thermal transport in liquid hydrogen tanks. ASME 2024 Heat Transfer Summer Conference, 15 July 2024. https://doi.org/10.1115/ht2024-130699.

Owens C, et al. Analytical and numerical modeling of a thermal switch via shape changing stimuli-responsive material. ASME 2024 Aerospace Structures, Structural Dynamics, and Materials Conference, 29 Apr. 2024, https://doi.org/10.1115/ssdm2024-121609.

Owens C, et al. Tunable thermal transport in 4D printed mechanical metamaterials. Materials & Design 2023; 231:111992. https://doi.org/10.1016/j.matdes.2023.111992.

Farzinazar S, Wang Y, **Owens C**, et al. Thermal transport in 3D printed shape memory polymer metamaterials. APL Materials 2022; 10(8). https://doi.org/10.1063/5.0094036.

Owens C, et al. Comparative indoor and outdoor degradation of organic photovoltaic cells via inter-laboratory collaboration. Polymers 2015; 8(1):1. https://doi.org/10.3390/polym8010001.

Owens C, et al. Comparative indoor and outdoor degradation of organic photovoltaic cells via inter-laboratory collaboration. 2015 IEEE 42nd Photovoltaic Specialist Conference (PVSC) June 2015; 1–4. https://doi.org/10.1109/pvsc.2015.7356178.

Presentations

Owens C. Thermal transport in mechanical metamaterials. Presentation, 2023 Spacecraft Thermal Control Workshop, Torrance, CA, 2023.

Additional Education & Training

Graduate Researcher and Teaching Assistant, Department of Mechanical and Aerospace Engineering, University of California, Irvine, 2020-2025.

Peer Reviews

Journal of Heat Transfer Engineering