Exponent®
Engineering & Scientific Consulting

Vicente Robles, Ph.D.

Associate | Polymer Science and Materials Chemistry
Natick
+1-508-903-4660 tel | vrobles@exponent.com

Professional Profile

Dr. Robles' expertise lies at the intersection of thermal fluid sciences and experimental optics. At Exponent, Dr. Robles assists clients with optical safety analysis, optical material characterization, and the implementation of complex optical solutions. He is well versed in fluorescence thermometry, high-speed imaging, atomic force microscopy (AFM), scanning electron microscopy (SEM), and UV-Visible absorption spectroscopy. With a diverse optical skillset applicable to intersecting multidisciplinary fields, Dr. Robles provides solutions to issues relating to failure analysis, as well as safety and risk assessment in biomedical and consumer electronics products.

Prior to joining Exponent, Dr. Robles performed his Ph.D. work at the University of California, Riverside in the Department of Mechanical Engineering. His research focused on mechanical effects arising from liquid-laser interactions that result in shockwave emission and vaporization. Specifically, his research focused on investigating the dynamics of continuous-wave and pulsed laser-induced cavitation bubbles. This work was then applied to investigating more complex dynamics of a double-bubble interaction which results in formation of micro-jets for effective "needle-free" perforation of soft materials.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of California, Riverside, 2022

B.A., Physics, Pomona College, 2016

Ford Foundation Predoctoral Fellowship, 2018

Academic Appointments

Lecturer, Department of Physics and Astronomy, Pomona College, 2021

Professional Affiliations

Optica, SPIE, SHPE

Languages

Spanish

Publications

V. Robles, J. C. Gonzalez-Parra, N. Cuando-Espitia, G. Aguilar, "The Effect of Scalable PDMS Gas-Entrapping Microstructures on the Dynamics of a Single Cavitation Bubble," Scientific Reports (2022)

D. Contreras, V. Robles, and P. I. Choi, "Self-guided Inquiry Modules for the Remote Teaching of Undergraduate Physics Labs," Institute for Scientist & Engineer Educators, (2022).

B. Zhang, D. Banks, V. Robles, L. Felipe-Devia, G. Aguilar, "High resolution optical investigation of intensity and solution temperature effects on thermocavitation," Experimental Thermal and Fluid Science, 136 (2022)

J. C. Gonzalez-Parra, V. Robles, L. F. Devia-Cruz, R. I. Rodriguez-Beltran, N. Cuando-Espitia, S. Camacho-Lopez, G. Aguilar, "Mitigation of cavitation erosion using laser-induced periodic surface structures," Surfaces and Interfaces, 29 (2022)

V. Robles, E. Gutierrez-Herrera, L. F. Devia-Cruz, D. Banks, S. Camacho-Lopez, G. Aguilar, Soft material perforation via double-bubble laser-induced cavitation microjets, Physics of Fluids 32, 042005 (2020).; Editor's Pick*

D. Banks, V. Robles, B. Zhang, L.F. Devia-Cruz, S. Camacho-Lopez, G. Aguilar, Planar laser induced fluorescence for temperature measurement of optical thermocavitation, Exp. Therm. Fluid Science. 103, 385 (2019).

N. Zamora-Romero, V. Robles, C. Alvarez, N. Cuando-Espitia, L.F. Devia-Cruz, E. Penilla, D.L. Halaney, G. Aguilar, Laser-excited gold nanoparticles for treatment of cancer cells in vitro, SPIE 10417, Medical Laser Applications and Laser-Tissue Interactions VIII; 1041707 (2017).

Presentations

V. Robles, L. Felipe-Devia, D. Banks, G. Aguilar. Soft Material Perforation via Double-Bubble Cavitation Microjets. Oral Presentation, SoCal Fluids XIII, UC Santa Barbara, 2019.

V. Robles, L. Felipe-Devia, D. Banks, G. Aguilar. Laser-Induced Cavitation Bubbles for Micro-Scale Targeting. Oral Presentation, AAAS Recent Advances in Turbulence Research, Cal Poly Pomona, 2018.

V. Robles, B. Zhang, L. Felipe-Devia, D. Banks, G. Aguilar. Measuring the Temperature Field of an Optical Thermocavitation Bubble Using Planar Laser-Induced Fluorescence. Oral Presentation, APS 71st Annual Meeting Division of Fluid Dynamics, Georgia, 2018.

Peer Reviews

Physics of Fluids