Exponent®
Engineering & Scientific Consulting

Rita Garrido Menacho, Ph.D., CFEI, CVFI

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Professional Profile

Dr. Garrido Menacho is a condensed matter physicist with specialties in semiconductor/superconductor nanofabrication, surface characterization, and electrical testing. At Exponent, she employs her experimental background to assist clients with failure analysis and safety design reviews of consumer products, automotive electronic systems, and energy storage systems.

Dr. Garrido Menacho's work focuses on evaluating lithium-ion battery quality and design, battery pack protection circuitry, and overall product design safety through electrical, thermal, and mechanical testing. Dr. Garrido Menacho is experienced in performing root-cause failure analyses of field-returned units as well as assessing potential failure modes in new consumer products. Additionally, she has assisted in investigations involving automotive electronic system failures and recall-related matters.

Prior to joining Exponent, Dr. Garrido Menacho obtained her Ph.D. in Physics from the University of Illinois at Urbana-Champaign. Her experimental research focused on designing, performing, and analyzing cryogenic temperature resistivity measurements of nanoscale superconductor-based devices. She studied collective quantum phenomena arising from strong electronic interactions in these systems. Through her experimental work, she gained significant experience in nanofabrication and surface characterization processes including e-beam lithography, photolithography, e-beam evaporation, thermal evaporation, reactive ion etching (RIE), atomic force microscopy (AFM), scanning electron microscopy (SEM), and profilometry. In addition, she has extensive knowledge of cryogenics and cryogenic systems as well as low-noise electrical transport (lock-in amplifier) techniques. Dr. Garrido Menacho also served as a mentor for undergraduate students under the University of Illinois Physics Department GPS program.

Academic Credentials & Professional Honors

Ph.D., Physics, University of Illinois, Urbana-Champaign, 2020

B.S., Physics, Georgia Institute of Technology, 2013

SURGE Fellow, 2013

Scott Anderson Award, 2019

Licenses and Certifications

Certified Fire and Explosion Investigator (CFEI)

Certified Vehicle Fire Investigator (CVFI)

Prior Experience

Graduate Research Assistant, University of Illinois at Urbana-Champaign, 2014-2020

Intern, Inprentus Inc., 2019

Professional Affiliations

American Physical Society (member)

Institute of Electrical and Electronics Engineers (member)

Languages

Spanish

Publications

Naibert TR, Polshyn H, Garrido-Menacho R, Durkin M, Wolin B, Chua V, Mondragon-Shem I, Hughes T, Mason N, Budakian R. Imaging and controlling vortex dynamics in mesoscopic superconductor-normal-metal-superconductor arrays. Physical Review B 2021; 103:224526.

Durkin M, Garrido-Menacho R, Gopalakrishnan S, Kwon JH, Zuo JM, Mason N. Rare-region onset of superconductivity in niobium nanoislands. Physical Review B 2020; 101:035409.

Son J, Kwon J, Kim SP, Lv Y, Yu J, Lee JY, Ryu H, Watanabe K, Taniguchi T, Garrido-Menacho R, Mason N, Ertekin E, Huang PY, Lee GH, van der Zande AM. Atomically-precise graphene etch masks for 3D integrated systems from 2D material heterostructures. Nature Communications 2018; 9:3988.

Books

Arora A, Garrido Menacho R. 2025. EV Batteries, Chargers, and Subsystems. Artech House.

Book Chapters

Lele S, Garrido Menacho R. 2024. Chapter 7: Energy storage system safety and compliance. pp. 139-164. In: The Sustainable Power Grid: Challenges, Applications and Case Studies. Elsevier.

Kuykendal M, Mendias M, Garrido Menacho R. 2024. Chapter 8: Battery Management Systems: From Consumer Electronics to Electric Vehicles. pp. 245-261. In: Computer Engineering Applications in Electronic, Biomedical, and Automotive Systems. Nova Science Publishers, Inc.

Presentations

Arora A, Garrido-Menacho R. Electric vehicle batteries and charging systems: a primer. Tutorial presented at the IEEE Energy Conversion Congress and Expo, Detroit, Michigan, October 2022.

Garrido Menacho, R. Fire Investigations and analysis. CLE Webinar, Arizona Association of Defense Counsel, May 2025.

Garrido-Menacho R, Humbert V, Mason N. Disorder effects on superconductor-graphene-superconductor arrays. Poster presentation, International Workshop on The Superconductor-Insulator Transition and Low-Dimensional Superconductors, Villard de Lans, France, 2018.

Garrido-Menacho R, Humbert V, Mason N. Disorder effects on superconductor-graphene-superconductor arrays. Oral presentation, APS March Meeting, Los Angeles, CA, 2018.

Garrido-Menacho R, Durkin M, Mason N. Unusual vortex dynamics and phase transitions in mesoscopic superconducting islands. Oral presentation, APS March Meeting, New Orleans, LA, 2017.

Garrido-Menacho R, Durkin M, Gopalakrishnan S, Zuo JM, Mason N. Large variance of T_c at large length scales in granular mesoscopic Nb islands. Oral presentation, APS March Meeting, Baltimore, MD, 2016.