Nomination for AVS Excellence in Mentorship Award

Nominee: Dr. Mark D. Losego, Georgia Tech, <u>losego@gatech.edu</u> <u>https://www.researchgate.net/lab/The-Losego-PUMP-Lab-Mark-D-Losego</u> <u>https://mill.mse.gatech.edu</u>

Mentoring: Prof. Losego is the faculty founder and director of Georgia Tech's Materials Innovation and Learning Laboratory, The MILL (<u>https://mill.mse.gatech.edu</u>), the world's first open-access make-and-measure space devoted entirely to materials science and engineering. First opened in January 2017, the MILL provides undergraduate students free access to common tools for processing materials, characterizing their chemistry and structure, and measuring their properties, including benchtop electron microscopes, x-ray diffraction, x-ray fluorescence, IR spectroscopy, mechanical testing, UV/vis spectroscopy, thermogravimetric analysis, calorimetry, screen-printing, water contact angle analysis, and much more. The MILL is fully staffed by

undergraduate student volunteers that train other student users to operate and analyze the data from this equipment. Under Prof. Losego's leadership, the MILL now boasts over \$1 million in equipment and is open 40 hours/week by a staff of over 50 undergraduate students, including an entire c-suite of student leadership (CEO, COO, CTOs, etc.) that manages both the student staff and equipment operations and is self-sustaining via a corporate interview-and-hiring structure.



Unlike other maker spaces, the MILL emphasizes the analysis and quantitative measurements of what students make – not just making for making-sake. However, like other maker spaces, the MILL leverages simple-to-use equipment and peer-to-peer mentoring to remove barriers for student involvement and access. To further broaden its reach, the MILL also runs student-driven outreach teams (Learning and Discovery teams) that introduce students to research and scientific exploration. For example, the "Science of Art" and "Textile" teams bring over 200 students each semester to The MILL from all majors to create science-driven artwork and textile products (e.g., fused glass art and embroidered bags). These low-barrier activities attract diverse populations of students to the MILL to explore careers in research. For example, the mentee letter writer, a woman of color, first discovered research through the MILL, which led her to applying for and joining an REU and now to pursue a Ph.D. through a NASA-funded fellowship.

Since joining the faculty at Georgia Tech 7.5 years ago, Prof. Losego has mentored 14 graduate students (6 women, 2 URMs), 3 postdoctoral scholars (1 woman), 2 international student visitors, and over 40 undergraduate researchers (completely independent of the student staff in The MILL). His graduate students have won 9 prestigious graduate research fellowships (e.g., NSF, NDSEG, GEM, etc.) and sixteen of his undergraduate researchers have been co-authors on peer-reviewed publications; seven of those undergraduates are first-authors of their publications.

Short Bio: Mark D. Losego is an Associate Professor and MSE Faculty Fellow in the School of Materials Science and Engineering at the Georgia Institute of Technology. The Losego Lab focuses on vapor-phase materials processing and develops novel organic-inorganic hybrid materials for sustainable energy, national security, and technical textile applications. His research largely focuses on atomic layer deposition (ALD) and vapor phase infiltration (VPI) with particular interest in understanding the fundamental thermodynamics and kinetics of these processes and how to scale them for manufacturing. Prof. Losego has over 100 peer-reviewed publications and 2 awarded patents. He has been recognized with multiple awards including Georgia Tech's Outstanding Undergraduate Research Mentor Award (2019), Most Influential MSE Faculty (2019), Future Star of the AVS (2018), and a 125th Anniversary Fellow for the College of Earth and Mineral Sciences at Penn State University (2021). Prof. Losego also serves on Georgia Tech's College of Engineering Diversity, Equity, and Inclusion council where he develops tools to promote student equity and inclusion, including a campus resources module that is distributed to all students via the university's learning management software (Canvas) used for all courses on campus. Prof. Losego received his B.S. degree from Penn State University and his M.S. and Ph.D. from North Carolina State University, all in materials science and engineering. Prior to joining the faculty at Georgia Tech in 2014, he was a postdoctoral researcher at the University of Illinois and research faculty in Chemical & Biomolecular Engineering at North Carolina State University.