

Julia R. Greer



Ruben F and Donna Mettler Professor of Materials Science, Mechanics, Medical Engineering

Greer's research focuses on creating and characterizing nano- and micro-architected materials with multi-scale microstructural hierarchy using 3D lithography, nanofabrication, and additive manufacturing (AM) techniques, and investigate their mechanical, electrochemical, chemo-mechanical, and photonic properties as a function of architecture, constituent materials, and microstructural detail. We strive to uncover the synergy between the internal atomic- and molecular-level microstructure and the multi-scale external dimensionality, where *competing material- (nano) and structure- (architecture) induced size effects* drive overall response and govern these properties. Specific topics include applications of 3D nano- and micro-architected materials in devices, energy absorption, ultralightweight energy storage systems, chemically-assisted filtering, damage-tolerant fabrics, additive manufacturing, and multi-functional materials.

Greer obtained her S.B. in Chemical Engineering with a minor in Advanced Music Performance from MIT in 1997 and a Ph.D. in Materials Science from Stanford, worked at Intel (2000-03) and was a post-doc at PARC (2005-07). Julia joined Caltech in 2007 and currently is a *Ruben F. and Donna Mettler Professor of Materials Science, Mechanics, and Medical Engineering at Caltech*, as well as the *Fletcher Foundation Director of the Kavli Nanoscience Institute*, and the *Editor in Chief* of the **Journal of Applied Physics**.

Greer has more than 170 publications, has an h-index of 70, and has delivered over 100 invited lectures, which include 2 TEDx talks, multiple plenary lectures and named seminars at universities: Covestro Distinguished Speaker at U Pitt, Cooper lecture at Cornell, Israel Pollak Distinguished Lecture Series at Technion, David Pope lecture at Penn, and *Thayer Visionaries in Technology* at Dartmouth to name a few, the Watson lecture at Caltech, the Gilbreth Lecture at the National Academy of Engineering, the Midwest Mechanics Lecture series, and a "IdeasLab" at the World Economic Forum, and was selected as Alexander M. Cruickshank (AMC) Lecturer at the Gordon Research Conferences (2022).

She recently received the **Nadai Medal** from ASME Materials Division (2024), the **Eringer Medal** from the Society of Engineering Science (2024), was the inaugural AAFM-Heeger Award (2019) and was named a **Vannevar-Bush Faculty Fellow** by the US Department of Defense (2016) and CNN's 20/20 Visionary (2016). Her work was recognized among Top-10 Breakthrough Technologies by MIT's Technology Review (2015). Greer was named as one of "100 Most Creative People" by *Fast Company* and a Young Global Leader by World Economic Forum (2014) and received multiple career awards: Kavli (2014), Nano Letters, SES, and TMS (2013); NASA, ASME (2012), Popular Mechanics Breakthrough Award (2012), DOE (2011), DARPA (2009), and Technology Review's TR-35, (2008). She is an active member of scientific community through professional societies (MRS, SES, TMS), having organized multiple symposia, been chosen as Conference Chair (MRS, 2021; GRC 2016), served on the Board of Directors for Society of Engineering Science (SES) and on government agency panels: DOE's Basic Research Needs workshop on setting Priority Research Directions (2020), National Materials and Manufacturing Board through National Academies (2020), and DoD's Bush Fellows Research Study Team (2020).

Greer is also a concert pianist who performs solo recitals and in chamber groups, with notable performances of "Prejudice and Prodigy" with the Caltech Trio (2019), "Nanomechanics Rap" with orchestra MUSE/IQUE (2009), and as a soloist of Brahms Concerto No. 2 with Redwood Symphony (2006).