



**Donnerstag, 30.04.2026, 15:30 Uhr**

Ort: Reichenhainer Str. 90;  
Zentrales Hörsaal- und Seminargebäude, Raum C10.013

**Prof. Dr. Nitin P. Padture**

Brown University, Providence, USA

## The Promise of Halide-Perovskite Solar Photovoltaics

Renewable electricity from solar photovoltaics (PV), combined with low-cost large-scale storage, is likely to play a dominating role in decarbonizing the expanding global power sector. For example, the global deployment of PV is targeted at ~75 TW installed capacity by 2050, from today's ~2.5 TW. While currently used PV technologies are efficient, reliable, and relatively cheap, there is, and always will be, insatiable demand for new PV technologies that are more efficient and cost-effective, and importantly, have a smaller 'carbon-footprint.' In this context, the promising new PV technology based on a fascinating class of halide-perovskite materials has the potential to meet all those requirements. Perovskite thin-film PV can be mechanically rigid or flexible, where the latter lightweight PV are more versatile with the potential to power internet-of-things, vehicles, satellites, portable supplies, etc., in addition to rooftop and utility-scale applications. While the record power-conversion efficiency of perovskite PV now rivals that of conventional silicon PV, durability and mechanical reliability are becoming 'bottleneck' challenges in perovskite PV. To address some of these technical hurdles in the path towards their commercialization, we have researched several rationally-designed approaches, which include engineering of interfaces and substrates. Most importantly, these approaches are designed to not only enhance the PVs' mechanical performance but also increase efficiency and improve durability simultaneously. The scientific rationales for these approaches will be discussed, together with the presentation of current results

Nitin P. Padture is the Otis E. Randall University Professor in the School of Engineering, and founding Director of the Initiative for Sustainable Energy, at Brown University, USA. Previously he served as Director of Brown's Institute for Molecular and Nanoscale Innovation for eight years. Prior to January 2012, Padture was College of Engineering Distinguished Professor at The Ohio State University (OSU), and founding Director of the Materials Research Science and Engineering Center (MRSEC) at OSU. Before then he was on the faculty of University of Connecticut faculty for 10 years. Padture's research and teaching interests are in the broad areas of advanced ceramics, semiconductors, and nanomaterials used in applications ranging from jet engines to solar cells. Padture is author or co-author of over 300 publications, which have been cited widely. He is Fellow of the American Ceramic Society, the American Association for the Advancement of Science, and the Materials Research Society. Padture has received several other awards over the years, including Robert L. Coble and Richard M. Fulrath awards from the American Ceramic Society; the Distinguished Alumnus Award from his undergraduate alma mater, Indian Institute of Technology - Bombay; Brown University's Presidential Faculty Award; and the Humboldt-Forschungspreis from the Alexander von Humboldt Foundation, which is supporting his Current sabbatical stay at Helmholtz-Zentrum Berlin and Humboldt-Universität zu Berlin. Padture is Editor of the journals Acta Materialia and Scripta Materialia.

Alle Zuhörer sind ab 15:15 Uhr zum Kaffee vor dem Hörsaal eingeladen.

