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Michigan Institute for Plasma Science and Engineering

UM Plasma Prize 2023

Wednesday
November 20, 2024
1:30 pm
Room LEC 3213
(Johnson Rooms)

Prof. Peter Bruggeman

University of Minnesota

Low Temperature Plasma Science to Advance Human Health and Enable a Sustainable Future

Low temperature atmospheric pressure plasmas are an abundant source of reactive species. Their unique capability to produce a highly reactive environment at moderate gas temperatures enables several emerging applications with the potential to contribute to health care and a sustainable future. Low temperature plasmas offer fertile ground for many interesting often multi-disciplinary fundamental studies with direct societal benefit. We will report on several fundamental case studies of interactions of plasmas with liquids, bacteria, virus and catalysts in the context of decontamination, water treatment, materials synthesis and chemical conversion. The case studies often involve a detailed comparison between diagnostics and modeling which allowed us to uniquely identify mechanisms and rate limiting steps. While these studies have often been conducted in highly controlled environments and with canonical reactor setups, such studies provide insights that are critical for process development and might open the path towards a model of science driving technology development.

About the Speaker: Peter Bruggeman is a Distinguished McKnight University Professor and the Ernst Eckert Professor of Mechanical Engineering at the University of Minnesota. His research is focused on low temperature plasma science and engineering with applications in health and sustainability. He also serves as the Director of Graduate Studies of Mechanical Engineering and the Director of the High Temperature and Plasma Laboratory. Peter was an Assistant Professor of Applied Physics at the Eindhoven University of Technology, the Netherlands, from 2009 until he joined the University of Minnesota in 2013. He serves as an editorial board member of several journals, served on the National Academies Decadal Study of Plasma Science (Plasma 2020) committee, and co-edited the 2017 and 2022 Plasma Roadmap contributing to shape research directions for the field of low temperature plasma.