

Low temperature atmospheric pressure plasmas: an enabling technology for new applications.

Prof. Peter J. Bruggeman
University of Minnesota, USA

Low temperature plasmas have been used as an enabling technology for many industrial applications for example in the semiconductor industry, polymer material surface processing and ozone generation.

Low temperature plasma sources can produce a chemically rich environment at close to room temperature both even at ambient pressures, a unique condition that enables the delivery of highly reactive plasma species in a non-destructive and beneficial way to even extremely heat sensitive surfaces. These unique features are driving the development of many new applications in the field of medicine, water treatment and energy conversion.

This seminar will provide an overview of these developments and underlying processes that enable these technological developments. Specific examples studied by my group in the context of food decontamination, wound healing and nanoparticle treatment and synthesis will be discussed.

Dr. Peter Bruggeman is currently Professor of Mechanical Engineering at the University of Minnesota. He is also the Director of the High Temperature and Plasma Laboratory. Professor Bruggeman obtained his PhD from the University of Ghent, Belgium in 2008 and was an Assistant Professor of Applied Physics at Eindhoven University of Technology, the Netherlands from 2009 to 2013. His primary research interests are plasma-liquid interaction and non-equilibrium plasma kinetics and chemistry applied to plasma processes for environmental, biomedical and renewable energy technologies.

Professor Bruggeman received several awards including the 2012 Hershkowitz Early Career Award, the 2013 IUPAP Young Scientist Medal and Prize in Plasma Physics and the 2016 US Department of Energy Early Career Award. He is section editor for Plasmas and Plasma-Surface Interactions of the Journal of Physics D: Applied Physics and an elected member of the board of directors of the International Society of Plasma Chemistry. Professor Bruggeman is also the elected chair of the 2018 Gordon Research Conference on Plasma Processing Science and organized the conference "Frontiers in Low Temperature Plasma Diagnostics X" in 2013 in the Netherlands.

Professor Bruggeman published over 90 papers in peer-reviewed journals of which 11 have been selected as journal highlights. He has delivered invited and keynote lectures at over 60 international meetings and was a lecturer at several summer schools in Germany, USA, Canada and Brazil.