

# Modeling and Simulation Challenges Involving Multi-Physics, Multi-Scale, Multi-Dimension and Multi-Signal Electromagnetics

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## ABSTRACT

In parallel with the chronological progress in computing technologies, field/circuit modeling and simulations (M&S) have been instrumental in the scientific discovery, engineering design and technological development of RF, wireless and microwaves over MHz-through-THz. Thanks to the on-going investigation and deployment of emerging functional materials, processing techniques, and wireless devices, our applied electromagnetic community is deemed to enjoy in the many years to come an undisputable R&D expansion. However, a change in M&S landscape is transpiring before us which can affect our capability in connection with future high-frequency scientific and engineering development. In this presentation, we will discuss challenges in multi-physics, multi-scale, multi-dimension and multi-signal M&S environment that could stagnate our further hardware R&D activities in the field. Nevertheless, we can mold these computational challenges to create unique opportunities for our community to excel and expand further into a multi-dimensional and multi-functional scientific and engineering exploration and exploitation. We need to get ourselves prepared for the dawn of a new age.

## BIOGRAPHY

**Dr. Ke Wu** is Professor of Electrical Engineering at Polytechnique Montreal (University of Montreal). He holds the NSERC-Huawei Industrial Research Chair in Future Wireless Technologies (the first Huawei-endowed Chair in the world). He has been the Director of the Poly-Grames Research Center. He was the Canada Research Chair (2002-2016) in RF and millimeter-wave engineering and the Founding Director (2008-2014) of the Center for Radiofrequency Electronics Research of Quebec. Dr. Wu is also with the School of Information Science and Engineering at Ningbo University, on leave from his home institution. He has authored/co-authored over 1300 referred papers, and a number of books/book chapters and more than 50 patents. Dr. Wu was the general chair of the 2012 IEEE MTT-S International Microwave Symposium (the largest IEEE annual conference). He was the 2016 President of the IEEE Microwave Theory and Techniques Society (MTT-S). He also serves as the inaugural North-American representative in the General Assembly of the European Microwave Association (EuMA). He was the recipient of many awards and prizes including the inaugural IEEE MTT-S Outstanding Young Engineer Award, the 2004 Fessenden Medal of the IEEE Canada, the 2009 Thomas W. Eadie Medal from the Royal Society of Canada (The Academies of Arts, Humanities and Sciences of Canada), the Queen Elizabeth II Diamond Jubilee Medal, the 2013 Award of Merit of Federation of Chinese Canadian Professionals, the 2014 IEEE MTT-S Microwave Application Award, the 2014 Marie-Victorin Prize (Prix du Québec – the highest distinction of Québec in the Natural Sciences and Engineering), the 2015 Prix d'Excellence en Recherche et Innovation of Polytechnique Montréal, the 2015 IEEE Montreal Section Gold Medal of Achievement and the 2019 IEEE MTT-S Microwave Prize. He is a Fellow of the IEEE, a Fellow of the Canadian Academy of Engineering (CAE) and a Fellow of the Royal Society of Canada. He was an IEEE MTT-S Distinguished Microwave Lecturer from Jan. 2009 to Dec. 2011.