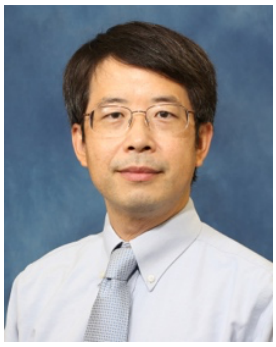

# Computational Electromagnetics (CEM) for Electromagnetic Compatibility (EMC) – Applying Mathematical Physics in Complex Electromagnetic Environments



**Dr. Lijun Jiang**
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**Monday, September 30, 9:55 am – 11 am Central Time**

**Zoom:** https://uh-edu-cougarnet.zoom.us/j/9762699678?pwd=RUp5ZmN3cHUyQ1FvUExVQjVsc1hVUT09
Meeting ID: 976 269 9678
Passcode: K91Bwy

## LECTURE ABSTRACT

With the rise of faster signal speeds and ultra-wide bandwidths, designing integrated circuits and electronic systems has become exceptionally challenging, particularly in terms of their EMC/EMI and SI/PI characteristics. In today's industrial project management process, simulation-based optimization and verification have become crucial for new designs. Computational Electromagnetics (CEM) technologies, which offer deep physical insights and modeling solutions for complex electromagnetic environments, have become essential in modern EDA systems. They are among enabling technologies to achieve the integration density target in both 2D and 3D. Additionally, advancements in machine learning are both driver and consumer of new electromagnetic modeling technologies.

This presentation will highlight our efforts to develop innovative numerical methods for complex electromagnetic systems using insights from physics, particularly in the areas of EMC/EMI/SI/PI analysis. We will discuss how the interplay between physics and mathematics has been pivotal in solving key challenges such as bandwidth limitations, efficiency, and inhomogeneity. In response to the advancements in machine learning, we are exploring ways to innovate our methods from algorithmic to application levels. Our recent progresses in machine learning and data-driven approaches for EMC/SI/PI research will be introduced, including our current and future expectations for large language model (LLM) tools in practical engineering applications.

## SPEAKER BIOSKETCH

**Lijun Jiang** (Fellow, IEEE) received his Bachelor Degree in electrical engineering from the Beijing University of Aeronautics and Astronautics in 1993, Master Degree from the Tsinghua University in 1996, and Ph.D from the University of Illinois at Urbana-Champaign (UIUC) in 2004. From 2004 to 2009, he has been a Postdoc, Research Staff Member, and Senior Engineer at IBM T.J. Watson Research Center, New York. He was the Associate

Professor from Dec. 2009 and then the Honorable Associate Professor at the Department of EEE, the University of Hong Kong (HKU), where he received tenure in 2014. From Sept. 2022, he was a full professor at the Dept. of EE, the Chinese University of Hong Kong and the Associate Director of Center for Intelligent Electromagnetic Systems (CiEMS). Since Sept. 2023, he has been the Kummer Endowed Professor at EMC Laboratory, Dept. of ECE, Missouri University of Science and Technology. He also worked at Hewlett-Packard and Teradyne as Tech Lead and Manager for high frequency measurement technologies and ASIC package designs.

He is an IEEE Fellow and ACES Fellow since 2019. He has received the IEEE Technical Achievement Award, IBM Research Technical Achievement Award, UIUC Y.T.Lo Outstanding Research Award, HP STAR Award, etc. He is the Chair of APEMC International Steering Committee and the Chair of IEEE (HK) EMC Chapter. He was the Associate Editor or Guest Associate Editor for IEEE Trans. on AP, Proceeding of IEEE, and IEEE Trans. on MTT. He was the member of IEEE AP Society Award Selection Committee from 2020 to 2022, and the award committee member of many international conferences.

His multidisciplinary research activities have resulted in leading research outputs over 190 peer-reviewed journal publications, many international and regional awards, multiple patents, and books/book chapters. His research interests include heterogeneous electromagnetic modeling methodologies, high speed electronic physical design and EDA solutions, machine learning for SI/PI and EMC/EMI, microwave technologies for material engineering, and optics, etc.

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