

News Release

Dr. Jennie Hwang & Dr. George Karniadakis to address "Artificial Intelligence – Opportunities, Challenges & Possibilities" (PDC 16) at International Symposium on Microelectronics of IMAPS on Monday, October 2 in San Diego, CA; Dr. Hwang also to instruct the course on: "High Reliability – Role of Intermetallic Compound & Tin Whisker" (PDC 4).

PDC 16: “Artificial Intelligence – Opportunities, Challenges & Possibilities”

As moving into Artificial Intelligence (AI) era, the explosion of new AI tools and platforms is remaking our daily lives and every aspect of workplace including research, engineering, design, manufacturing, and management across all industries from semiconductor and printed circuit board design to life sciences and new material design. Even not being an AI technologist, staying in the core knowledge zone is a viable strategy to remain proficient and competitive in the workplace.

In light of the transformative potential of AI technologies, this short course offers a holistic overview of AI with the goal to spur innovative ideas and inspire new vistas to capitalize the sound benefits of AI and maximize on-job efficiency and effectiveness.

The recent emergence of OpenAI's GPT, Generative AI and conversational AI makes the awareness of the development of AI-related products, use cases and “possible” future become more crucial to the on-job performance. All industry sectors are expected to reorient around AI; the ability to balance between the AI's omnipotent power and its downsides is key to leveraging AI as virtuous tools. Businesses will distinguish themselves by how well they use the tools and how reliable and safe the designed tools can deliver. This course will map out AI landscape including manifold perspectives on the current and future of AI development and deployment. The key components behind the AI technologies including machine learning (ML), deep learning (DL), Neural Networks (NN), Internet of Things (IoT), digital twins, predictive modeling and ChatGPT-led AI boom will be outlined. AI with justified confidence and trust will also be highlighted.

Topics:

1. Background & diverse perspectives on AI
2. Current state of AI
3. AI – justified confidence
4. AI – machine learning, deep learning, digital twin, IoT and use cases
5. Generative AI, OpenAI - ChatGPT
6. Diffusion models, how transformers work
7. Scientific Machine Learning and examples in Industry applications
8. Modeling / simulation, digital twin – use cases
9. Deep learning NN architectures and expressive programming frameworks
10. AI - Uncertainty Quantification
11. New technologies – SNN, dynamic reasoning, continual learning (multitasking)

12. Global leaders & competitiveness - examples
13. AGI - Artificial General Intelligence
14. Brain, mind, and intelligence
15. Future of AI
16. Concluding remarks.

Who Will Benefit:

Co-speakers, Dr. Jennie Hwang (Chair of AI Committee of the National Academies and External Review Panel member of NSF National AI Institutes, as well as a pioneer and long-standing leader in Surface Mount Technology/Manufacturing and lead-free electronics implementation) and Dr. George Karniadakis (a top authority on digital twin, AI and physics-informed neural networks), bring broad-based knowledge and deep predictive modeling expertise to this course.

The course provides working knowledge and integrated overview to help make informed decisions about how to navigate into the future of AI, suitable to all who are interested in staying in the knowledge zone for professional fulfillment including designers, researchers, managers, production, quality and reliability professionals, executives, and business decision makers; also designed for those who desire broad-based information with holistic perspectives on AI.

PDC 4: “High Reliability Electronics – Role of Intermetallic Compound and Tin Whisker”

To ensure the long-term performance and reliability of microelectronic/electronic products serving defense, aerospace, automotive, medical, and other high reliability end-use products, intermetallic Compounds (IMCs) and tin whisker play increasingly critical roles at the chip level, package level and board level of packaging and assembly.

This course covers the relevant and important aspects of IMCs ranging from scientific fundamentals to practical application scenarios. IMCs before and during the formation of solder interconnection, and during the product service life will be examined. Intermetallic at-interface and in-bulk, as well as the effects of IC and passive component surface finishes in relation to IMCs, in turn, to reliability will be discussed. The difference between SnPb and Pb-free solder joint in terms of intermetallic compounds, which affects production-floor yield and the actual field failure, will be outlined.

From practical perspectives, tin whisker with emphasis on risk mitigation through understanding of the physical phenomena, causes, concerns and impact will be illustrated by real-world product failure case studies. The factors that affect tin whisker growth and its testing challenges will be outlined. The practical criteria of tin whisker and the relative effectiveness of mitigating measures will be ranked.

The course provides a working knowledge to all who are concerned with or interested in tin whisker and IMC issues in microelectronic/electronic packages and assemblies including researchers, designers, engineers, managers and business decision makers; also is designed for those who desire a broad-based understanding of the subject.

Attendees are welcome to bring their own selected systems for deliberation.

About the Instructor

Dr. Jennie Hwang brings deep knowledge and comprehensive experience to this course through both hands-on and advisory capacities. She has provided solutions to most challenging issues in mission-critical high reliability products, covering commercial and military applications. An International Hall of Famer of Women in Technology and a member of National Academy of Engineering, she is author and

co-author of ten internationally-used textbooks and 675+ publications/editorials; a featured speaker in innumerable international and national events; has received numerous honors and awards; on Board of NYSE Fortune 500 companies and on various civic/government/university boards and committees
Further Info: www.JennieHwang.com