簡介

汪正平教授

汪正平教授為國際著名電子工程學學者，現任美國喬治亞理工學院董事教授及材料科學及工程學院查爾斯·史密斯高爾研究所(Charles Smithgall Institute)講座教授、香港中文大學電子工程學系榮休教授及香港科技大學機械及航空航天工程學系客座教授。

在香港完成小學、中學教育後，他留學美國取得普渡大學理學學士學位、賓夕法尼亞州立大學哲學博士學位，其後獲發博士後獎學金於史丹福大學跟隨諾貝爾獎得主亨利·陶布(Henry Taube)教授開展高級研究。

之後，他加入美國貝爾實驗室工作 19 年，研究取得突破性進展，並於 1992 年獲選為貝爾實驗室院士，這是該實驗室的最高專業獎項。其後他進入喬治亞理工學院繼續學術事業。在 2010 年，汪教授回到香港特別行政區，出任香港中文大學工程學院院長，於 2018 年卸任。

汪教授主要研究方向為聚合物電子材料、電子封裝及互連、介面結合、納米功能材料的合成及特性及納米複合材料，如定向碳納米管、石墨烯、無鉛合金、倒裝晶片底部填充材料、超高介電常數電容器複合材料及基於荷花效應的超疏水塗層材料。他從根本上改變了半導體封裝技術，開拓聚合物及納米技術等新材料，取得了巨大的成本效益。

他是塑封技術的開拓者之一。1977 年，他在貝爾實驗室創新地採用矽樹脂對柵控二極體交換機(GDX)進行封裝研究，實現利用聚合物材料對 GDX 結構的密封等效封裝，顯著提高封裝可靠性，此塑封技術克服了傳統陶瓷封裝重量大、工藝複雜、成本高等問題，被 AT&T、Intel、IBM 等公司廣泛採用，目前塑封技術佔世界集成電路封裝市場的 95%以上。

汪教授還解決了長期困擾封裝界的導電膠與器件界面接觸電阻不穩定問題，該導電膠創新技術已在漢高(Henkel)等公司中使用。他還在業界首次研發了無溶劑、玻璃轉化溫度(Tg)高的非流動性底部填充膠，簡化倒裝晶片封裝工藝，提高器件的性能和可靠性，被日立(Hitachi)等公司長期使用。此後，他帶領團隊研發了矽基碳納米管陣列轉移技術，為 3D 互連以及納米電子器件等領域奠定了堅實基礎。

汪教授發表超過 1,000 篇專業論文，撰寫及編輯 12 本專著，持有超過 65 項美國專利。

因其矚目成就，汪教授分別於 2000、2013 及 2015 年當選為美國國家工程院院士、中國工程院外籍院士及香港科學院創院院士。

汪教授為學界、工業界及社會做出巨大貢獻，因其革命性創新成就，被譽為“現代半導體封裝之父”。

Biography

Professor Ching-Ping Wong

Professor Ching-Ping Wong is a world-renowned scholar in the field of electronic engineering. He is Regents' Professor and Charles Smithgall Institute Endowed Chair in the School of Materials Science and Engineering at Georgia Institute of Technology in the United States. He is Emeritus Professor at the Department of Electronic Engineering of the Chinese University of Hong Kong, and an adjunct professor in the Department of Mechanical and Aerospace Engineering at the Hong Kong University of Science and Technology.

Professor Wong received his primary and secondary education in Hong Kong. He received his BS degree from Purdue University and his PhD degree from the Pennsylvania State University in the United States. After his doctoral study, he was awarded a postdoctoral fellowship to undertake advanced research under the supervision of Nobel laureate Prof. Henry Taube at Stanford University.

He later joined AT&T Bell Laboratories (Bell Labs) and served there for nineteen years. Professor Wong's research achievements at Bell Labs were ground-breaking, and he was awarded the title of AT&T Bell Laboratories Fellow in 1992 – the highest technical award bestowed by Bell Labs. Later, he went on to pursue an academic career at Georgia Institute of Technology. In 2010, Professor Wong returned to the Hong Kong SAR to assume the position of the Dean of Engineering at the Chinese University of Hong Kong (CUHK). He served in this capacity until 2018.

Professor Wong's research interests lies in the fields of polymeric materials, electronic packaging and interconnect, interfacial adhesions, nano-functional material syntheses and characterizations, nano-composites such as well-aligned carbon nanotubes, graphenes, lead-free alloys, flip chip underfill, ultra-high k capacitor composites and novel lotus effect coating materials. He changed the packaging technology for semiconductors fundamentally, pioneering the use of new materials ranging from polymers to nano-technologies and achieved substantial cost efficiency.

Professor Wong is one of the forerunners in the development of plastic packaging technology. In 1977, while working in Bell Labs, he pioneered the packaging of gate-switched diode switches (GDX) using silicone, enabling the use of polymer materials to seal the equivalent package of GDX structures, significantly improving the packaging reliability of GDX. Overcoming the problems of heavy weight, complicated process and high cost of traditional ceramic packaging, this new technology has been widely embraced by companies such as AT&T (American Telegraph and Telephone Company), Intel and IBM. At present, plastic packaging accounts for more than 95% of the world's integrated circuit packaging market.

He has also resolved the issue of unstable contact resistance between the conductive adhesive and the device interface which has long plagued the packaging industry. The conductive adhesive innovation technology has been used by Henkel and other companies. He also developed the first solvent-free, high-Tg non-flow underfill in the industry, simplifying the flip-chip packaging process and improving the device's performance and reliability. This non-flowing underfill technology has long been used by companies such as Hitachi. Since then, he has led the research team to develop silicon-based carbon nanotube array transfer technology, which has laid a solid foundation for 3D interconnects and nanoelectronic devices.

Professor Wong has published widely with over 1,000 technical papers, authored and edited 12 books. He holds over 65 US patents.

In recognition of his stellar achievements, Professor Wong was elected a Member of the US National Academy of Engineering in 2000, a Foreign Academician Member of the Chinese Academy of Engineering in 2013 and a Founding Member of the Hong Kong Academy of Sciences in 2015.

In summary, Professor Wong has made outstanding contributions to academia, industry and society. He is widely known as the Father of Modern Semiconductor Packaging for his revolutionary innovations.