

DOCTOR OF SCIENCE *honoris causa*

Professor Kun HUANG

Citation

Just mention “Born and Huang” to solid state physicists and they immediately recognize this as a synonym for the book *Dynamic Theory of Crystal Lattices*. Co-written by Nobel laureate Max Born and the renowned Chinese physicist Kun Huang, the book has been regarded as the bible on the subject among physics researchers worldwide for over 40 years. When Professor Huang finished this classic in Beijing in 1952, he was only 32 years old. At 36 he was elected a Member of the Chinese Academy of Sciences. He became a Foreign Member of the Royal Swedish Academy of Sciences in 1980, and a Fellow of the Third World Academy of Sciences in 1985.

During the tumultuous years of China’s war against Japanese invasion, Professor Huang studied at the National Southwest Associated University in Kunming under the supervision of Professor Ta-You Wu, one of the founders of contemporary physics research in China. Between 1945 and 1948, Professor Huang did research for his PhD at the University of Bristol in England under the distinguished solid state physicist and Nobel laureate Sir Neville Mott. During those years, Professor Huang put forward a theory predicting the diffuse scattering of X-rays due to crystalline defects. His theory was verified in the 1960s and was subsequently named “Huang’s diffuse scattering”.

Between 1947 and 1951, Professor Huang conducted postdoctoral research at the University of Liverpool and made three significant scientific contributions that have had a far-reaching influence on the subsequent development of solid state physics. The theory of multiphonon transition, characterized by what is now often referred to as the “Huang-Rhys factor”, was co-developed by Professor Huang and Avril Rhys, who later became his wife. He also put forth the important “Huang’s Equations” relating the optical displacements in crystals, and macroscopic electric field and polarization. They led to the important concept of coupled electromagnetic field and optical vibration modes, known as polariton.

Professor Huang returned to his beloved motherland in 1951 and became Professor of Physics at Peking University. In 1977 he was appointed Director of the

理學榮譽博士

黃昆教授

讚辭

“玻恩和黃”(Born and Huang), 是諾貝爾得獎者德國物理學家馬克斯·玻恩和中國物理學家黃昆合著的《晶格動力理論》一書的簡稱, 在固體物理學界人盡皆知。這本著作40多年來被世界各地的物理學研究者推崇備至, 奉若“聖經”一般。黃昆教授於1951年在北京完成這部經典名著時, 剛滿32歲。36歲時, 他當選為中國科學院最年輕的學部委員, 即院士。1980年, 黃教授被選為瑞典皇家科學院的外籍院士; 1985年當選為第三世界科學院院士。

在艱苦的抗日戰爭歲月, 黃教授修業於昆明西南聯大, 師從中國現代物理學奠基人之一吳大猷教授。1945-48年, 黃教授在英國布列斯托大學深造, 師從固體物理學大師, 另一位諾貝爾得獎者莫特爵士。莫特的治學風格對黃教授產生了重大影響, 形成了他專注於具體問題的嚴謹風格, 影響了他一代又一代的弟子。在攻讀博士學位期間, 黃教授就從理論上預言了與晶體中雜質相關的X光漫散射, 以後稱為“黃散射”; 這個理論在六十年代獲實驗證實。

1947-51年, 黃教授在英國利物浦大學進行博士後研究, 完成了三項他自認為畢生最有影響的科學工作。這三項工作在後來都以他的名字命名, 或公認為源於他的研究; 對推動固體物理的發展起了重要作用。其中一項是由黃教授和他後來的夫人里斯女士合作發展的多聲子躍遷理論, 以“黃-里斯因子”而著稱於世。另外兩項是描述晶體中光學位移、宏觀電場與電極化三者關係的“黃方程”, 和由此引出的電磁波與晶格振動的耦合, 即後來稱為極化激元的重要概念。

Institute of Semiconductors, Chinese Academy of Sciences. A pioneer in China's semiconductor science, Professor Huang led five major mainland universities to jointly run a program on semiconductors in 1956, which trained the first generation of semiconductor experts in China.

At the Institute of Semiconductors, Professor Huang created an active academic atmosphere that emphasized fundamental research. He himself also entered another phase of scientific breakthroughs. In 1983, Professor Huang solved a long-standing puzzle in non-radiative multiphonon transition theory by explaining the inappropriateness of the Condon approximation. From this he was able to show that the apparently unrelated adiabatic approximation theory and static coupling theory are actually equivalent. The superlattice optical phonon mode model and analytical expressions for the proper modes, recently proposed by Professor Huang and Professor Bang-fen Zhu, are now widely accepted by the international physics community as the "Huang-Zhu model".

Professor Huang's contribution as scientist and educator has been profound. The milestones he has reached in phonon physics throughout the decades have greatly benefited the human race and are the pride of the Chinese nation. He is highly respected not only for his academic achievements but also for his ideals and noble character.

Mr Pro-Chancellor, I have the honor to present to you, on behalf of the University, Professor Kun Huang, Member of the Chinese Academy of Sciences and Honorary Director of the Institute of Semiconductors, Chinese Academy of Sciences, for the degree of Doctor of Science *honoris causa*.

Read by Prof Richard HAYNES and translated from the Chinese citation written by Dr Weikun GE.

1951年底，黃教授滿腔熱誠地回到自己深愛的祖國，任北京大學物理系教授，直至1977年調任中國科學院半導體研究所所長。黃教授是中國半導體事業的開拓者，他於1956年領導由內地五所著名大學聯合開辦的半導體專門化，為中國培養了第一批半導體人才；這些人才繼而成為全國各地半導體事業發展的領袖。

黃教授為中科院半導體研究所帶來了重視基礎研究的新風尚，培養了一個理論與實驗結合、學術氣氛活躍的半導體物理研究群體。他本人也迎來了科學研究的第二春：針對國際上在多聲子無輻射躍遷理論中出現的疑難問題，黃教授於1983年證明了在消除康登近似帶來的不自恰性後，理論界兩種似乎互不相關的處理方法——即絕熱近似與靜態耦合——其實是等價的。他與朱邦芬教授提出計算超晶格光學聲子模式的模型及類體模的解析表達式，被國際物理學界廣泛接受，並稱之為“黃-朱模型”。

從“黃散射”到“黃方程”，從“黃-里斯因子”到“玻恩和黃”，以至“黃-朱模型”，黃教授在固體物理學發展史上建樹了一塊又一塊豐碑；他的貢獻是屬於全人類的，同時也為中國民族爭得了榮耀和尊敬。黃教授不僅是傑出的科學家和教育家，更是高風亮節的楷模。他的品德和學問同樣令人景仰！

副監督先生，本人謹代表香港科技大學，恭請閣下向中國科學院院士、中國科學院半導體研究所榮譽所長黃昆教授頒授理學榮譽博士學位。

中文讚辭由葛惟昆博士撰寫。