

Professor Sir Fraser STODDART

Chair Professor of Contemporary Chemistry, the Department of Chemistry, Faculty of Science 理學院化學系講座教授

A distinguished chemist and Nobel Laureate, Professor Stoddart was a Board of Trustees Professor of Chemistry at Northwestern University for 16 years before joining HKU in 2023. He is also the Dean of the Stoddart Institute of Molecular Science at Zhejiang University and a Visiting Professor of Chemistry at both Northwestern University and the University of New South Wales. Stoddart's groundbreaking research has transformed the understanding of chemical bonding by introducing the concept of the mechanical bond. He is currently working on the fabrication of molecular pumps and electric molecular motors, and his research spans the fields of chemistry, materials science, and molecular nanotechnology. In addition to the 2016 Nobel Prize in Chemistry, he is a recipient of the Centenary Prize from the Royal Society of Chemistry and the 2007 King Faisal International Prize in Science. He has been named Highly Cited Researcher for 11 consecutive years, and is a Fellow of the National Academy of Sciences, USA, the Royal Society of London, UK, and a foreign member of the Chinese Academy of Sciences.

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Stoddart 教授在化學、材料科學和分子納米技術等領域擁有豐富的閱歷和知識。他在過去 16 年一直擔任美國西北大學董事會教授。Stoddart 教授的變革性研究源於一種嶄新的化學鍵 – 機械鍵的構建。這項研究成果更新了人們對化學鍵的認知。利用分子識別，Stoddart 教授開發出高效合成機械互鎖分子拓撲結構的方法，例如索烴（catenanes）和輪烷（rotaxanes）等。他進一步展示了這些機械互鎖分子的雙穩性（bistability），並利用這一獨特性質開發了可整合於納米電子設備和納米機電系統（NEMS）中的分子開關。Stoddart 教授近期的研究致力於分子泵和電動分子馬達的開發。通過剖析和理解動力學不對稱性和軌跡熱力學，他設計了泵送盒（pumping cassettes），並實現了機械互鎖分子組分的單向運動。由於泵送盒的運動可被精準調控，人們可以合成具有指定環數的分子聚輪烷。這些新興的聚合物展示了獨特的刺激響應性。Stoddart 教授的突破性研究為他贏得無數的榮譽和獎項，除了在 2016 年憑藉對分子機器的設計和合成的開創性研究，與 Bernard L. Feringa 和 Jean-Pierre Sauvage 一同獲頒諾貝爾化學獎，他在 2007 年獲頒費薩爾國王國際科學獎，以及連續 11 年被戴科睿唯安（Clarivate）評為高被引科學家；此外，他是美國國家科學院院士、英國皇家學會院士以及中國科學院外籍院士。