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# Fraser Stoddart

## Two-Page Curriculum Vitae

Board of Trustees Professor of Chemistry

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### EDUCATION

University of Edinburgh	DSc	Chemistry	1980
University of Edinburgh	PhD	Chemistry	1966
University of Edinburgh	BSc	Chemistry	1964

### PROFESSIONAL ACTIVITIES

2008-	Board of Trustees Professor of Chemistry at Northwestern University
2003-2007	Fred Kavli Chair in NanoSystems Sciences at University of California, Los Angeles
1997-2003	Saul Winstein Chair in Organic Chemistry at University of California, Los Angeles
1993-1997	Head of School of Chemistry at University of Birmingham, UK
1990-1997	Professor of Organic Chemistry at University of Birmingham, UK
1981-1990	Reader in Chemistry at University of Sheffield, UK
1978-1981	On secondment to ICI Corporate Laboratory, Runcorn, UK
1970-1978	Lecturer in Chemistry at University of Sheffield, UK

### AWARD AND HONORS / SELECTED SINCE 1994

2021	Corresponding Member of the Australian Academy of Science
2020	Chemistry Europe Fellowship
2019	Fellowship of the American Chemical Society
2019	Membership of the National Academy of Inventors, USA
2019	Science and Technology Cooperative Award (Chinese Government)
2018	Foreign Membership of the Chinese Academy of Sciences
2017	Membership of the EU Academy of Sciences
2016	Nobel Prize in Chemistry (Royal Swedish Academy of Sciences)
2014	Membership of the National Academy of Sciences, USA
2012	Fellowship of the American Academy of Arts and Sciences, USA
2011	Honorary Fellowship of the Royal Society of Chemistry, UK
2010	Royal Medal of the Royal Society of Edinburgh (Prince Philip, Duke of Edinburgh)
2008	Davy Medal of the Royal Society of London
2008	Arthur C Cope Award (American Chemical Society)
2008	Honorary Fellowship of the Royal Society of Edinburgh, UK
2007	King Faisal International Prize in Science
2007	Appointed Knight Bachelor by HM Queen Elizabeth II
2007	Feynman Prize in Nanotechnology (Experimental)
2007	Albert Einstein World Prize in Science
2007	Tetrahedron Prize for Creativity in Organic Chemistry
2006	Membership of the Royal Netherlands Academy of Arts and Sciences
2004	Nagoya Gold Medal in Organic Chemistry
1999	Fellowship of the German Academy (Leopoldina) of Natural Sciences
1994	Fellowship of the Royal Society of London, UK

## SCIENTIFIC PUBLICATIONS / SELECTED SINCE 2010 / Radical Chemistry / Molecular Machines

1. Radically enhanced molecular recognition (A. Trabolsi, N. Khashab, A.C. Fahrenbach, D.C. Friedman, M.T. Colvin, K.K. Cotí, D. Benítez, E. Tkatchouk, J.-C. Olsen, M.E. Belowich, R. Carmieli, H.A. Khatib, W.A. Goddard III, M.R. Wasielewski, J.F. Stoddart), *Nature Chem.* **2010**, *2*, 42-49.
2. Mechanical bond formation by radical templation (H. Li, A.C. Fahrenbach, S.V. Dey, S. Basu, A.Trabolsi, Z. Zhu, Y.Y. Botros, J.F. Stoddart), *Angew. Chem. Int. Ed.* **2010**, *49*, 8260-8265.
3. Great Expectations: Can artificial molecular machines deliver on their promise? (A. Coskun, M. Banaszak, R.D. Astumian, J.F. Stoddart, B.A. Grzybowski), *Chem. Soc. Rev.* **2012**, *41*, 19-30.
4. A radically configurable six-state compound (J.C. Barnes, A.C. Fahrenbach, D. Cao, S.M. Dyar, M. Frasconi, M.A. Giesener, D. Benítez, E. Tkatchouk, O. Chernyashevskyy, W.H. Shin, H. Li, C.L. Stern, A.A. Sarjeant, K.J. Hartlieb, Z. Liu, R. Carmieli, Y.Y. Botros, J.W. Choi, A.M.Z. Slawin, J.B. Ketterson, M.R. Wasielewski, W.A. Goddard III, J.F. Stoddart), *Science* **2013**, *339*, 429-433.
5. Relative unidirectional translation in an artificial molecular assembly fueled by light (H. Li, C. Cheng, P.R. McGonigal, A.C. Fahrenbach, M. Frasconi, W.-G. Liu, Z. Zhu, Y. Zhao, C. Ke, J. Lei, R.M. Young, S.M. Dyar, D.T. Co, Y.-W. Yang, Y.Y. Botros, W.A. Goddard III, M.R. Wasielewski, R.D. Astumian, J.F. Stoddart), *J. Am. Chem. Soc.* **2013**, *135*, 18609-18620.
6. An artificial molecular pump (C. Cheng, P.R. McGonigal, S.T. Schneebeli, H. Li, N.A. Vermeulen, C. Ke, J.F. Stoddart), *Nature Nanotech.* **2015**, *10*, 547-553.
7. Design and synthesis of non-equilibrium systems (C. Cheng, P.R. McGonigal, J.F. Stoddart, R.D. Astumian), *ACS Nano* **2015**, *9*, 8672-8688.
8. Mastering the non-equilibrium assembly and operation of molecular machines (C. Pezzato, C. Cheng, J. F. Stoddart, R. D. Astumian), *Chem. Soc. Rev.* **2017**, *46*, 5491-5507.
9. An efficient artificial molecular pump (C. Pezzato, M.T. Nguyen, C. Cheng, D.J. Kim, M.T. Otley, J.F. Stoddart), *Tetrahedron* **2017**, *73*, 4849-4857.
10. A molecular dual pump, (Y. Qiu, L. Zhang, C. Pezzato, Y. Feng, W. Li, M. T. Nguyen, C. Cheng, D. Shen, Q.-H. Guo, Y. Shi, K. Cai, F. M. Alsubaie, R. D. Astumian, J. F. Stoddart), *J. Am. Chem. Soc.* **2019**, *141*, 17472-17476.
11. A precise polyrotaxane synthesizer (Y. Qiu, B. Song, C. Pezzato, D. Shen, W. Liu, L. Zhang, Y. Feng, Q.-H. Guo, K. Cai, W. Li, H. Chen, M.T. Nguyen, Y. Shi, C. Cheng, R.D. Astumian, X. Li, J.F. Stoddart), *Science* **2020**, *368*, 1247-1253.
12. Electron-catalysed molecular recognition, (Y. Jiao, Y. Qiu, L. Zhang, W.-G. Liu, H. Mao, H. Chen, Y. Feng, K. Cai, D. Shen, B. Song, X.-Y. Chen, X. Li, X. Zhao, R. M. Young, C. L. Stern, M. R. Wasielewski, R. D. Astumian, W. A. Goddard III, J. F. Stoddart), *Nature* **2022**, *603*, 265-270.

## RESEARCH INTERESTS

Analytical Chemistry / Batteries / Biological Chemistry / Bistable Systems / Carbohydrate Chemistry / Catalysis / Catenanes / Chemical Topology / Chirality / Circular Dichroism / Coordination Chemistry / Crown Ethers / Crystallography / Cucurbiturils / Cyclodextrins / Dendrimers / Drug Delivery Systems / Dynamic Covalent Chemistry / Electrochemistry / Emergent Behavior / Flashing Energy Ratchets / Gold Chemistry / Hydrogen Bonding / Inorganic Chemistry / Information Ratchets / Isothermal Titration Calorimetry / Liquid Crystals / Macrocyclic Chemistry / Macromolecular Chemistry / Mass Spectrometry / Materials Chemistry / Mechanical Bonds / Mechanically Interlocked Molecules / Mechanostereochemistry / Mesoporous Silica Nanoparticles / Metal-Organic Frameworks / Molecular Belts / Molecular Borromean Rings / Molecular Boxes / Molecular Cages / Molecular Knots / Molecular Mechanics / Molecular Machines / Molecular Motors / Molecular Nanotechnology / Molecular Pumps / Molecular Recognition / Molecular Shuttles / Molecular Solomon Knots / Molecular Switches / Noncovalent Bonding Interactions / Nuclear Magnetic Resonance Spectroscopy / Out-of-Equilibrium Systems / Photochemistry / Physical Chemistry / Physical Organic Chemistry / Polymer Chemistry / Radical Chemistry / Rotaxanes / Second-Sphere Coordination / Self-Assembled Monolayers / Self-Assembly / Self-Replication / Stereoelectronic Effects / Stereochemistry / Structure-Directed Synthesis / Supramolecular Chemistry / Supramolecular Polymers / Template-Directed Synthesis / Synthetic Chemistry / Unnatural Product Synthesis.