

Sir Harold W. Kroto

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Sir Harold Kroto - Nobel Prize for Chemistry 1996, Francis Eppes Professor, Department of Chemistry and Biochemistry, Florida State University - obtained his BSc in Chemistry in 1961 and PhD in Molecular Spectroscopy in 1964 at the University of Sheffield. After post-doctoral work at the National Research Council in Ottawa from 1964 to 1966 he spent a year at the Murray Hill Bell Laboratories and in 1967 he started his academic career at the University of Sussex in Brighton.

By 1970 he had carried out research in the electronic spectroscopy of gas phase free radicals, rotational microwave spectroscopy of semi-stable molecules, laser-Raman studies of liquid phase interactions and quantum chemistry. In 1974 he finally obtained a much-awaited Hewlett Packard microwave spectrometer and the first molecule studied was the first long carbon chain species, HC₅N. Laboratory and radioastronomy studies on this linear chain molecule and its even longer analogues led to the surprising discovery that they are present in interstellar space as well as the expanding gaseous envelopes that surround red giant stars. Laboratory experiments with co-workers at Rice University in 1985, designed to simulate the chemical reactions in the atmospheres of such stars, showed that they were indeed present, as expected, but also serendipitously uncovered the existence of the C₆₀ molecule – a completely unexpected discovery. The C₆₀ molecule has an elegant structure with the same geometric pattern as the modern soccer ball which consists of 12 pentagonal faces and 20 hexagonal ones. Kroto called it Buckminsterfullerene after the American architect who had developed the application of this fundamental structural concept in order to create the geodesic domes which are now ubiquitously used to span and cover huge areas.

The discovery of C₆₀ caused Kroto to shelve his dream of setting up a graphic design studio which had been since University a semi-professional occupation. The unique properties of this molecule and other related cage species – the Fullerene family caused him to focus his efforts on probing the fundamental consequences of the C₆₀ concept and to exploit the synthetic chemistry and material sciences applications. In 1991 he was awarded a Royal Society Research Professorship which enabled him to concentrate on this research programme. From 1990 to 2000 he was chairman of the editorial board of the Chemical Society Reviews. In 1995 he inaugurated the Vega Science Trust (www.vega.org.uk) to create science films of sufficient high quality for network (BBC) television broadcast. He has now initiated a Global Educational Outreach (GEO) programme to create a network of Internet sites (gateway site www.geoSET.info) aimed at enabling scientists to create and broadcast their own scientific programmes on the web

and in particular help teachers to teach Science, Engineering and Technology (SET) as well as possible by giving them access to the best SET material worldwide. In 1996 he was knighted for his contributions to chemistry and later that year awarded the Nobel Prize for Chemistry, together with Robert Curl and Richard Smalley. He has received honorary degrees from many universities in the UK and abroad, as well as numerous awards including: the Royal Society of Chemistry Tilden Lectureship 1981, the Italgas Prize for Innovation in Chemistry (1992), the Royal Society of Chemistry Longstaff Medal (1993) as well the Faraday Award for Public Understanding of Science (2001) and the Copley Medal (2004) of the Royal Society. In 1990 he was elected a fellow of the Royal Society (London) and in 2007 a Foreign Associate of the American Academy of Sciences. From 2002 to 2004 he was President of the Royal Society of Chemistry (UK). His first major award was not for science but for graphics when in 1964 he won the Sunday Times prize for Book Jacket Design and in 1994 he won the LVMH "Science pour l'Art" prize.