

**UKRI AGM and LECTURE  
13th March 2002**

**Professor John Roulston OBE  
BAE Systems**

Joint Meeting with IEE at Savoy Place, London  
Lecture at 18:30 in the Faraday Room

## *Climbing the Complexity Spiral in Electronic Design*

**A century ago** the science of electronics began as an adjunct to the emerging understanding of the structure of matter. Accelerated by cycles of entertainment, communication, commerce and war, the modern science has become a prop of civilisation.

In this lecture I will examine how this has happened, illustrate the key developments that have driven the science forward, reflect on the qualities of the practitioners involved and outline the path of the future. In this illustrated odyssey we will note a trend of exponential growth in complexity, matched by ingenious adaptation of the science to keep implementation within practical bounds.

As we climb the complexity spiral we begin to note similarities between electronic systems and biological counterparts as if common laws of organisation prevail. Each specialist conference opens new vistas of processes, materials, automation and product ambition and the end is not in sight.

However, a few steps on the future path are recognisable and we use these to project the science of electronics into the second decade of the new century, asking where the limits may lie and seeking to paint a vision of tomorrow's electronic world.

### ***About the author:***

**John Roulston** was a schoolboy hobbyist in the age of vacuum tube electronics and started a career as an electronics circuit designer with Ferranti Ltd., Edinburgh, as the vacuum age gave way to transistors and integrated circuits. With a strong interest in mathematical modelling and a thirst for novelty he helped the company to define and realise some of the most complex radar projects undertaken in Britain. In the past twelve years as successive industrial rationalisations have changed the personality and emphases of the electronics industry in Britain, John Roulston has become responsible for all the avionic technology within the BAE SYSTEMS company, now incorporating the electronics legacy of Ferranti, Plessey and Marconi Electronic Systems.

John has a Bachelors degree in Electronics from Queens University, Belfast, a Masters degree in Communications and Control from Heriot Watt in Edinburgh and an Honorary Doctorate in Engineering also from Heriot Watt. He was awarded the O.B.E. in 1998 and holds the British Gold Medal of the Royal Aeronautical Society and the James Alfred Ewing Gold Medal of the Institute of Civil Engineers and the Royal Academy of Engineering. John Roulston is a Fellow of the Royal Society of Edinburgh and Industrial Professor of Electronics at Edinburgh University. He is married with two teenage daughters and lives in Edinburgh.