

ME DEPARTMENTAL SEMINAR

Friday, November 17, 2006

2:00pm – 3:00pm

2211 GG BROWN

**Professor Chris R. Calladine
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University of Cambridge
Cambridge, UK**

“DNA: An Engineering Perspective”

Abstract:

In this talk I shall describe several "mechanical" studies of DNA, made in order to understand features of its behaviour, observed in crystallographic assays and "wet" biochemistry. Most of the work was done in collaboration with Horace Drew, and has been described in our book *Understanding DNA* (Academic press/Elsevier 1992, 1997, 2004).

Here are some of my topics:

- Why is double-stranded DNA helical?
- What is the nature of the "switch" between the well-characterised "A" and "B" forms of DNA?
- Single-crystal x-ray structures of specific DNA oligomers in the 1980s showed much less regular geometry than in the "classical" structures obtained previously by x-ray diffraction of DNA fibres. How do such perturbations come about?
- What is the nature of the observed sequence-dependent *flexibility* and *intrinsic curvature* of DNA?
- Does DNA possess a "second code", in addition to its standard 3-letter code for amino acids?
- How can we understand the anomalous slow-running of repeat-sequence DNA in electrophoretic gels?

Bio:

Chris Calladine is Emeritus Professor of Structural Mechanics in the University of Cambridge, and Emeritus Fellow of Peterhouse. He is a Fellow of the Royal Society, and of the Royal Academy of Engineering. He was on the faculty of the Engineering Department at Cambridge from 1960 to 2002. In addition to researching many aspects of structural engineering, he has applied the methods of structural mechanics to the study of bacterial flagella and DNA.