



## CARES Visiting Scientists Seminar Series:

### Unexpected outcomes from Curiosity and Technology driven Science

#### In the field of polymeric materials and process engineering

Emeritus Professor Malcolm Mackley, University of Cambridge

Thursday 7th Dec, 5.00pm - 6.00pm

CREATE Theatrette, Level 2, CREATE Tower



**Abstract:** Both curiosity and technology driven scientific discoveries have and continue to play a major part in all our lives and this presentation will overview areas where initial curiosity driven science and process innovation has resulted for most cases in significant technological application. The examples are drawn from direct experience and cover a period of nearly 40 years where aspects of polymer and process innovation is involved. An early example concerns the fundamental study of polymer morphology at Bristol University by the Late Prof Andrew Keller and Sir Charles Frank where their work resulted in the eventual discovery of a key membrane element for modern batteries and also High Modulus Polyethylene (HMP) fibres and recently films. Further examples will be given where a blend of curiosity and technology driven science resulted in the invention of a continuous Oscillatory Flow Mixing technology (OFM), a Multi Pass Rheometer (MPR) and novel plastic Micro Capillary Film (MCF). Finally a fast filament stretching apparatus initially designed for ink jet printing science will be described which provides general understanding of droplet and surface tension related technologies. In all cases described the underlying theme will be that “good science”, whether curiosity or technology driven, will invariably eventually find useful application, although often not in the initially intended area.



**Biography:** Malcolm Mackley graduated in Physics from the University of Leicester in 1969. He then obtained his PhD at Bristol University working in the field of Flow induced Polymer crystallization under the guidance of the late Sir Charles Frank and Andrew Keller. After a brief period as lecturer in Material Science at Sussex University he joined in 1979 the Department of Chemical Engineering at the University of Cambridge.

Malcolm is a scientist an engineer and an inventor and his Polymer Fluids Group scientific contributions involved mainly rheology and polymer processing. He is the inventor of a number of scientific apparatus and in terms of process innovation he has invented a novel chocolate extrusion process, a different way of mixing using oscillatory flow and a more recent plastic Microcapillary Film (MCF) that contains continuous arrays of 100 micron hollow capillaries. He has lectured extensively at Cambridge in the fields of polymers, process innovation and rheology and has given many conference presentations throughout the world. He is a Fellow of the Royal Academy of Engineering and an Emeritus Fellow of Robinson College Cambridge.