

## Next generation liquid crystal display and laser devices

### Simultaneous multi-wavelength liquid crystal laser devices

Professor Harry Coles is Director of the Centre of Molecular Materials for Photonics and Electronics. His research includes work on the optical, nonlinear optical, electrical and magnetic properties of a wide range of liquid crystals. The centre, which was officially opened in 2003 by Lord Sainsbury of Turville, combines research scientists from a number of different disciplines including organic chemistry, physics, and engineering. This enables fundamental research to be carried out in the design and synthesis of organic materials for the next generation of photonic and electronic applications.

Recently, a new breed of laser, the organic laser, has attracted a great deal of attention from the science community. Liquid crystal lasers, in particular, have been the focus of intense research at CMMPE over the past few years under the direction of Prof. Coles. These organic lasers are of significant interest for a number of reasons:

*They form self-organising periodic structures; exhibit a low energy threshold; have a large coherence area; the dimensions of the laser are of the order of micrometers; the emission wavelength is tunable; single mode; high output powers are potentially achievable.*

**Other technologies that Prof Coles is currently working on:** Fast-switching high contrast liquid crystal displays and blue phase liquid crystals.

#### Prof Coles's areas of expertise include:

- Liquid Crystal Physics
- Linear and Nonlinear Optics
- Photonic Devices and Displays
- Ferroelectrics
- Flexoelectricity
- Photochromics
- Diffractive and Holographic Elements
- Waveguide couplers
- Quasi and Adaptive Optics
- Raman and Correlation Spectroscopy
- X-Ray Scattering
- Electro-optics and Dielectric Studies
- New materials



Professor Harry Coles  
Director, CMMPE

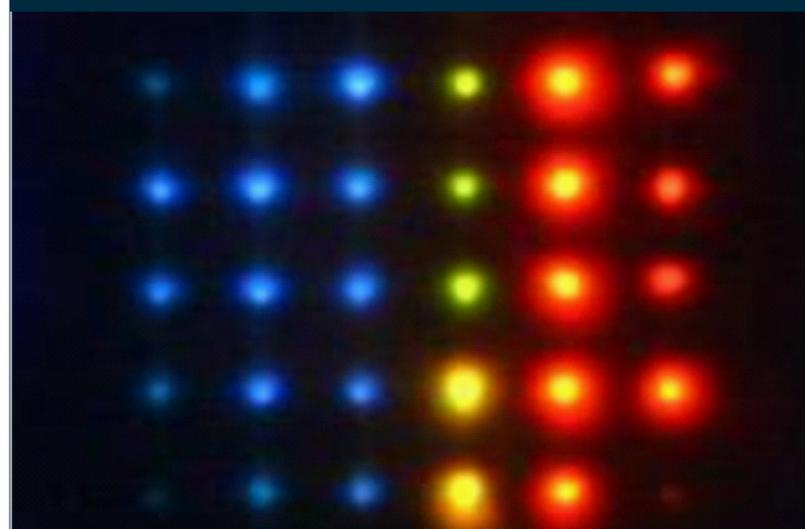
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#### Applicable to:

- Displays
- Telecommunications

#### Partner Companies:

- LG Display



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