

# Integration of photonics and electronics for optical communication systems and 3D displays

## Spatial light modulation for data distribution and energy saving

Professor Daping Chu is the Head of the Photonics & Sensors Group at Cambridge, with a research focus embracing photonic and sensing devices, functional materials and their integration at system level. The P & S Group aims to address future societal needs with new system functionalities through invention of novel device architectures based on in-depth understanding of basic material properties.

Some of our recent research progress includes:

**Space light modulation using phase-only holography** - Development of next generation colour-free reconfigurable optical add-drop multiplexers (ROADMs) with multi-casting capability for telecommunication, and a world leading 3D display demonstrator with full parallax and occlusion effects.

**High brightness multi-stable trans-reflective displays and applications** - The world's first reflective multi-colour demonstrator based on Smectic A liquid crystal (SmA LC) materials, and radiation control panels for energy saving in the built environment.

As well as conducting highly focused studies, we also specialise in the development of demonstrators for business exploitation and commercialisation. This is facilitated by multi-disciplinary expertise within the group and by our highly experienced team approach. Some of the outcomes from the group have been successfully transferred to our industrial collaborators for production.

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

- Phase-only holography for telecoms and 3D displays
- High brightness and flexible colour trans-reflective displays
- Tunable dielectric materials and modules for GHz/THz
- Phase only liquid crystal on silicon (LCOS) device
- Novel bio-sensors



Professor Daping Chu  
Head of Photonics & Sensors

Supported by EPSRC

### Applicable to:

- Display and light control
- Telecommunications



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