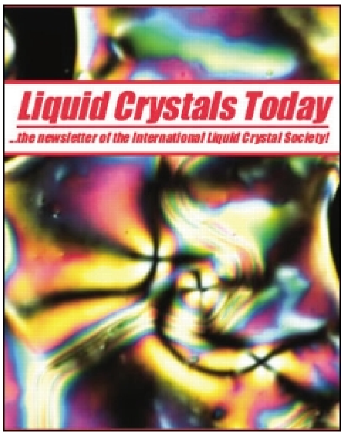
This article was downloaded by:
On: *16 January 2011*
Access details: *Access Details: Free Access*
Publisher *Taylor & Francis*
Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Liquid Crystals Today
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713681230

A New Beginning for *Liquid Crystals Today*

David Dunmur

To cite this Article Dunmur, David(1994) 'A New Beginning for *Liquid Crystals Today*', Liquid Crystals Today, 4: 3, 1
To link to this Article: DOI: 10.1080/13583149408628641
URL: http://dx.doi.org/10.1080/13583149408628641

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: http://www.informaworld.com/terms-and-conditions-of-access.pdf

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Newsletter of the International Liquid Crystal Society

LIQUID CRYSTALS Today

Vol. 4, No 3, December 1994

Downloaded At: 18:31 16 January 2011

A New Beginning for *Liquid Crystals Today*

Following discussions and negotiations over the past few months, the Board of Directors have agreed to transfer the publication of *Liquid Crystals Today* to publishers Taylor and Francis Ltd. The transfer is expected to take place early in 1995, and the first edition of the new *Liquid Crystals Today* is scheduled to appear in March 1995. Members of the ILCS will continue to receive their copies free, but publication costs will no longer be borne by the Society. The savings generated will enable the Society to develop new initiatives for the benefit of its members. *Liquid Crystals Today* will continue to be the official publication of the ILCS, but it is intended to expand its contents and coverage. The ILCS are in the process of establishing an Editorial Board, which will be responsible for the content of Liquid Crystals Today, and will guide the development of the Newsletter to serve the interests of members and liquid crystal scientists around the world.

Liquid crystal displays are now regarded as mature technology, but as this issue's feature article indicates, there are many other exciting possibilities to be exploited. There are also many remaining challenges in the basic science of liquid crystals, and *Liquid Crystals Today* will attempt to provide the interface between basic science and new applications. It is hoped that all those involved in liquid crystals will welcome the opportunities provided by the new *Liquid Crystals Today*, and will continue to support it.

David Dunmur, Editor

CONTENTS:

NEW APPLICATIONS FOR FERROELECTRIC LIQUID CRYSTALS

T D WILKINSON, W A CROSSLAND, S T WARR, T C B YU, A B DAVEY AND R J MEARS, Cambridge University Engineering Department, Trumpington Street, Cambridge CB2 1PZ, UK

Ferroelectric Liquid Crystal Spatial Light Modulators

The evolution of Ferroelectric Liquid Crystal (FLC) Spatial Light Modulators (SLM) has heralded a new era in optical computing. The FLC properties permit a wide range of non-display applications to be implemented, e.g. optical correlation with the Binary Phase Only Matched Filter (BPOMF), Computer Generated Holograms (CGH), and a variety of optical switching applications and optical neural networks. The development of VLSI (Very Large Scale Integration) backplane SLMs [1] allows architectures to be directly translated to exploitable commercial applications.

The FLC SLM can modulate the phase or intensity of light using the characteristic optical properties of the LC pixels. The liquid crystals used in FLC devices are in the chiral smectic C (tilted) phase, and when confined in a thin cell (several microns thick) the orientation direction of the liquid crystals (the director) is restricted to two allowed states, one of which is selected by appropriate alignment layers. Under these conditions the liquid crystal is a uniform optically uniaxial layer, and as there is a dipole moment associated with the liquid crystals, they can be switched electrically from one allowed state to the other. Applying a field across the FLC cell causes the molecules to 'flip' into their lowest energy state; reversing the field will select the other state. This is equivalent to rotating the optic axis through twice the tilt angle (2θ), and this rotation can be used to create amplitude or phase modulation. Figure 1 shows the structure of a single backplane SLM pixel: transparent electrodes are deposited onto the glass, and alignment layers over these. The ferroelectric liquid crystal material is sandwiched between the top electrode and an aluminium mirror deposited onto a silicon wafer; spacers control the FLC layer thickness, and VLSI circuitry controls the voltage across the pixel and decodes signals from the electronic interface.

(Continued over page)

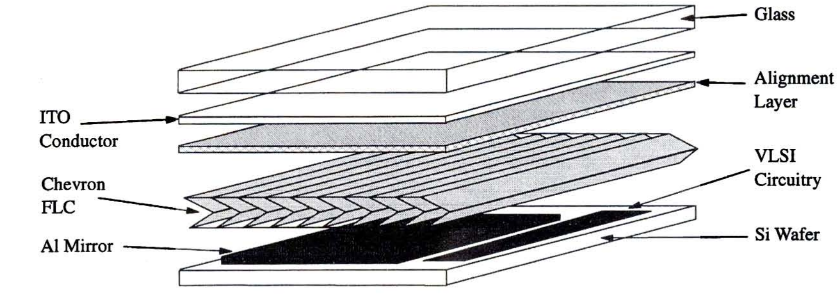


Figure 1. *A single FLC backplane SLM pixel structure*