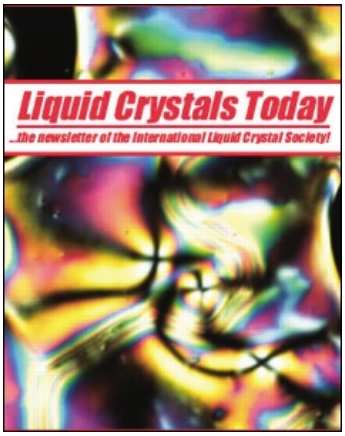

Liquid Crystals Today
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713681230

1996 Society For Information Display, 12-17 *May, San Diego, California*

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To cite this Article Crawford, Gregory P.(1996) '1996 Society For Information Display, 12-17 *May, San Diego, California*', Liquid Crystals Today, 6: 2, 14
To link to this Article: DOI: 10.1080/13583149608047647
URL: http://dx.doi.org/10.1080/13583149608047647

MEETING REPORT

1996 Society For Information Display

12–17 May, San Diego, California

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The annual Society for Information Display (SID) Conference was held in beautiful San Diego, California. The SID Symposia are certainly the best way for researchers and technologists to keep in touch with the ever changing and dynamic display arena. The 1996 SID Symposium was an exciting, highly informative, and entertaining event that made participants more knowledgeable, effective, and productive. I strongly encourage that more ILCS members take part in the SID Symposia in the future. The conference is heavily dominated by liquid crystal materials and displays. Although it is strongly focused towards electro-optic applications and displays, there is a lot of basic physics, chemistry, and engineering to be learned from the excellent papers and talks. The proceedings are published in a 1022 page volume entitled SID International Symposium Digest of Technical Papers, Volume XXVII (ISSN 0097-966X), edited by Jay Morreale, and it can be purchased from SID, 1526 Brookhollow Drive, Suite 82, Santa Ana, CA 92705-5421, USA.

The annual SID event is the premier international gathering of scientists, engineers, manufacturers, and users of flat panel displays where all aspects of information display are discussed, from surface anchoring and viewing angle, to human factors and ergonomic issues. The meeting provides access to a wide range of technology and applications from high-definition flat panel displays using both emissive and liquid crystal technology to the latest in CRT monitors and large area projection display systems. With the ongoing renaissance in flat panel displays, it is no wonder that the SID Symposium greatly expands every year. This year there was a record number of market display offerings which turned out to be the largest exhibition of electronic display products and equipment in North America.

It was a great pleasure this year to see our very own Professor George W.Gray receive the Karl Ferdinand Braun Prize for his outstanding contributions to the understanding of liquid crystal materials and the creation of stable compounds for use in LCDs. Congratulations George!

From the LCD perspective this year, there seemed to be three basic trends in which most papers and talks addressed: reflective displays; non-rubbed alignment layers; and solutions to the viewing angle problems in ordinary twisted-nematic displays.

Professor T. Uchida started off the Reflective Display session with an invited paper entitled 'Reflective LCDs for Low-Power Systems' in which he described all of the promising approaches to reflective LCDs. T. Sugiyama and co-workers demonstrated an amorphous aligned, chiral nematic, guest–host, LCD and its positive attributes such as its polarizer free operation, wide viewing angle, and small hysteresis. B. Taheri presented an interesting talk on the optical properties of cholesteric reflective displays demonstrating the pronounced effect of the helical axis distribution on the photometric and colorimetric properties. G. Crawford presented results on a full-colour, holographically formed polymer dispersed liquid crystal display using a colour additive scheme. This was followed by a very nice presentation by K. Sunohara and co-workers who demonstrated a three layer, guest–host, reflective colour display with very impressive performance parameters. M. Ozeki and co-workers demonstrated a single-layer, super-reflective mode LCD using electrically controlled birefringence technology. An exciting spin-off of reflective display technology was presented by L. Li and S. Faris in which they demonstrated a single layer, broad-band reflective polarizer based on a cholesteric liquid crystal material. J. Li and co-workers demonstrated a bistable liquid crystal device using polymer stabilization with very fast response times and T. Hatano and co-workers have developed a paper-white reflective display based on cholesteric liquid crystals. X.-Y. Huang reported on a new four-step driving scheme that allows faster addressing of cholesteric reflective displays. The reflective LCD component to the conference was very healthy this year.

There were many exciting poster presentations dedicated to reflective LCDs. A. Khan and co-workers showed a unique way to characterize the orientational distribution of the helical axis in the planar state of a cholesteric liquid crystal. Y. Ji demonstrated a very novel method to form polymer walls in high polymer content, bistable, reflective cholesteric displays to adhere the substrates and improve brightness and contrast. H. Seki reported on a new reflective-type guest–host display with high brightness using a light scattering mode. T. Uchida and co-workers impressed us with his very fast response and grey scale capable optically compensated bend liquid crystal display. S.Huttelmaier and co-workers presented a very impressive prototype of an active matrix polymer dispersed liquid crystal display and J. Neijzen and co-workers reported on the scattering behaviour of polymer dispersed liquid crystal films.

There was a lot of activity this year at the conference on liquid crystal alignment. V. N. Raja reported on the temperature dependence of the pretilt angle on side-chain-liquid-crystalline surfaces. S. Kohzaki and co-workers presented a director model for the axially symmetric aligned microcell mode. J. Chen and co-workers presented the methods to obtain four-domain alignment using low and high pretilt surfaces. Most of the alignment papers centred around the ways to fabricate non-rubbed surfaces using UV irradiation. The 'trick' is to obtain a pre-tilt, and,if possible, be able to pattern the substrates for two- and four-domain alignment. J. Chen and co-workers also presented a detailed study describing the underlying mechanisms for photo-induced alignment. K.-H. Lee reported on mechanisms responsible for pretilt in linear polarized UV irradiated surfaces and its application to two-domain configurations. T. Yamamoto and co-workers showed how to get pretilt by slantwise irradiation of non-polarized UV light on a polyimide layer. J. H. Kim demonstrated new photopolymers for photo-alignment of liquid crystals. X. Wang and co-workers presented four-domain configurations using high-pretilt photo-aligned polyimide surfaces. Y. Saitoh and co-workers presented data on the stability of two-domain wide viewing angle TFT panels.

T. Geelhaar and co-workers presented an exciting invited lecture on the trends in liquid crystal materials. From the viewing angle perspective, there was much interest in the in-plane switching technique which provides superior viewing angle performance as compared to conventional twisted nematic configurations. Several manufacturers of LCDs demonstrated fantastic viewing angle performance using the in-plane switching mode and promised that they will hit the market very soon. Lien and Chen presented a talk on 2-D simulations of the in-plane switching mode. T. Saitoh and co-workers took a different approach to the viewing angle problem showing homeotropically aligned nematics with dual subpixels which exhibit a very wide viewing angle.

On the ferroelectric front, M. Wand discussed the advances in ferroelectric liquid crystals for microdisplay applications. Funfschilling and Schadt presented very broad temperature range deformed helix materials for video LCDs. G. Cnossen reported on defect free alignment of the deformed helix. S. Kataoka and co-workers reported on polymer stabilized ferroelectrics with bistable and quasi-electroclinic behaviours. T. Saishu and co-workers presented the voltage holding properties of antiferroelectric liquid crystals driven by an active matrix.

There was certainly much more at the conference that I will not attempt to cover in this short report. It was clear from the conference focus that reflective liquid crystal displays will be the next major shift in display technology with colour reflective LCDs being the ultimate goal. Much of the viewing angle solutions, e.g. retardation films, dual-domain, in-plane switching, etc., are already being implemented into flat panel displays and are being introduced to the market.