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EDITORIAL

The 2014 Luckhurst–Samulski Prize

The *Luckhurst-Samulski Prize* was first announced in 2009 [1] and quickly became established as a major prize in our field. It is awarded annually to the best paper published in *Liquid Crystals* in that year,[2–6] and the first five recipients of the award are listed in Table 1.[7–11]

Best is a concept easily defined, but harder to recognize. The demanding challenge to the *Prize's* Selection Committee, consisting of the Editorial Board and myself as Editor, was how to select the best paper from over 200 papers published in 2014. The exhaustive selection process began with the referees who, as part of the reviewing process, can flag a paper as a worthy Prizewinner. These suggestions were brought to the attention of the Selection Committee tasked initially with compiling a long list from which the *Prize* was eventually chosen. Each member of the Selection Committee can nominate any number of papers at this stage, but the Referees' suggestions have to receive support from a member of the Selection Committee to be taken forward. These nominations are compiled into a long list and those receiving the most nominations form the short list. Each Selection Committee member then votes for what they consider to be the best paper from this shortlist. Any member of the Selection Committee having a shortlisted paper was exempted, of course, from this final stage of the selection process.

This was the fourth year in succession that the long list contained papers from all 12 issues of the *Journal* published during the year, reflecting the depth of quality of work appearing in *Liquid Crystals*. The 2013 *Prize* awarded to Pawel Pieranski and his colleagues [11] was selected from a shortlist containing seven other papers.[12–18] This year the shortlist comprised of nine papers, and any one of these would have made an outstanding winner of the *Prize*.

I am delighted to report that the 2014 *Luckhurst–Samulski Prize* has been awarded to Hideo Takezoe and Fumito Araoka for their paper entitled *Polar columnar liquid crystals*.[19] Geoffrey Luckhurst announced this decision and presented the *Prize* to Professor Takezoe at a ceremony held at the European Conference on Liquid Crystals held in Manchester, UK (Figure 1). This prizewinning paper overviews strategies to create a polar columnar phase with the polarity along the column axis. This is a demanding challenge as well as being one of significant technological significance. It is clear that the successes described have been based on ingenious molecular design, coupled with the elegant experimental design needed to reveal the Ising polarisation. It is also clear that these studies have come a long way, but the authors also describe the challenges still waiting to be solved. The Selection Committee considered that this outstanding review of a highly topical and relevant area will stimulate considerable activity aimed at overcoming these challenges.

The remaining eight articles making up the long list were highly commended by the Selection Committee, and these are, in strict chronological order of publication, first the paper by Kang and colleagues entitled *High-transmittance liquid-crystal displays using graphene conducting layers* [20] which describes the use of graphene films as alternative transparent conducting layers to ITO in LCD devices. The manuscript compares the optical and electro-optic performance of TN cells fabricated using monolayer and bilayer graphene films prepared on glass substrates with those of cells containing conventional ITO electrodes. The authors report improved values of optical transmittance for the cells containing graphene, although the sheet resistance of the graphene film is higher than that of ITO. The article concludes that graphene is an effective alternative to ITO in LCD devices, but there are still challenges to be overcome. The Selection Committee considered this paper to be an important step in realizing the application potential of graphene in LCD devices.

In the second of these papers, entitled *Orientation control over bent-core smectic liquid crystal phases*, [21] Yoon and colleagues review methods for controlling the macroscopic orientation of B phases composed of bent-core molecules, or their superstructures, and discuss several potential applications of B phases that have been fabricated according to these methods. The essential properties of the so-

Table 1. Previous winners of the *Luckhurst–Samulski Prize*.

Year	Authors	Title	Reference
2009	Goodby JW, Saez IM, Cowling SJ, Gasowska JS, MacDonald RA, Sia S, Watson P, Toyne KJ, Hird M, Lewis RA, Lee S-E, Vaschenko V.	Molecular complexity and the control of self-organising processes.	[7]
2010	Jakli A.	Electromechanical effects in liquid crystals.	[8]
2011	Skarabot M, Lokar Z, Gabrijelcic K, Wilkes D, Musevic I.	Atomic force microscope based method of measuring short cholesteric pitch in liquid crystals.	[9]
2012	Picken SJ, Dingemans TJ, Madsen LA, Francescangeli O, Samulski ET.	Uniaxial to biaxial nematic phase transition in a bent-core thermotropic liquid crystal by polarising microscopy.	[10]
2013	Pieranski P, Yang B, Burtz LJ, Camu A, Simonetti F.	Generation of umbilics by magnets and flows.	[11]

Figure 1. Geoffrey Luckhurst (left) presenting Hideo Takezoe (centre) with the 2014 *Luckhurst–Samulski Prize*, and the Editor, Corrie Imrie (right).

called B phases, especially their polarity and chirality, are described beautifully. The focus of the review is on the challenge to produce monodomain samples of the different phases which is especially difficult when they do not form nematic phases. The Selection Committee considered that this masterly state-of-the-art overview will have a significant impact on further developments in this highly topical area.

The third of these papers by Kimura and colleagues entitled *Study of electro-optical properties of liquid crystal/reactive mesogen-coated liquid crystal display fabricated by slit coater* [22] describes a pioneering study of the slit coater method for printable LCD devices. The Selection Committee considered this to be a key paper investigating a coating process with wide-ranging applicability to other liquid crystal-based films.

The fourth of these papers by Zhou and Zhang entitled *Dynamics of order reconstruction in nanoconfined twisted nematic cells with a topological defect* [23] reports a theoretical study of order reconstruction dynamics in nematics using numerical methods. Specifically, within the framework of Landau-de Gennes theory, a numerical study of the structure of $s = -1/2$ twisted disclinations in thin planar cells is described on decreasing the cell gap and shows that the defect eventually explodes into a biaxial layer. The force calculated using this approach agrees well with published experimental data. The Selection Committee considered this to be a novel and important contribution to the field.

The fifth paper by Lavrentovich and colleagues entitled *Properties of the broad-range nematic phase of a laterally linked H-shaped liquid crystal dimer* [24] reports detailed structural studies of the nematic phase shown by a new H-shaped dimer. These reveal the nematic phase to be uniaxial with embedded smectic nanoclusters which exist throughout the nematic range. In alignment studies, the dimer shows surface anchoring transitions in which the director changes its surface orientation from tangential to tilted. The authors suggest that H-shaped dimers containing odd-membered spacers may be candidates to exhibit the spay-bend nematic phase. The Selection Committee viewed this as an important study of the nematic phase shown by this class of

compounds which typically exhibit predominantly smectic behaviour, and considered this may serve to trigger considerable further work in the area, especially in the search for the splay-bend nematic phase.

The sixth paper by Igor Gvozdovskyy entitled *Influence of the anchoring energy on jumps of the period of stripes in thin planar cholesteric layers under the alternating electric field* [25] presents an extensive experimental study of the dependence of the cholesteric pitch in thin cells on the applied electric field, with a particular focus on the pitch jumps. The influence of the anchoring energy on the pitch jumps was also investigated and revealed that no jumps occur in cells with sufficiently weak anchoring. The hysteresis effect of the electric field was studied in detail. The Selection Committee viewed this work as being extremely important for both fundamental and technological reasons and provides experimental verification of previous theoretical studies.

The final two papers on the shortlist both involved Atsushi Yoshizawa. In the first of these, entitled *Flexible taper-shaped liquid crystal trimer exhibiting a modulated smectic phase*, Yoshizawa and colleagues [26] describe the synthesis and characterisation of a new class of taper-shaped liquid crystal trimers. These compounds show a layer-modulated SmC phase thought to arise from a competition between intercalated and monolayer structures. Head-to-tail electrostatic interactions between adjacent molecules were thought to be important in stabilising the phase structure. The Selection Committee considered this to be an important study on a new class of materials and which is likely to trigger much further study of taper-shaped trimers given the unusual and fascinating phase behaviour observed. In the second of the two papers, entitled *Effects of liquid crystallinity on anticancer activity of benzoate derivatives possessing a terminal hydroxyl group*, Yoshizawa and colleagues [27] report the synthesis and characterization of a group of new liquid crystals and study their anti-proliferative activity against cancer cells. The Selection Committee considered this an exciting application for liquid crystals, and a novel approach in the design of new anticancer drugs.

The 2014 Prizewinning paper and the eight highly commended articles comprise an outstanding and highly diverse collection of papers, and I would strongly encourage everybody, irrespective of their scientific background, to read these papers. I would like to thank all the authors who published their work in *Liquid Crystals* in 2014 and the Selection Committee for their hard work in choosing the winner of the 2014 *Luckhurst–Samulski Prize*. The *Journal* continues to thrive and I am particularly pleased to announce that for the sixth consecutive year the impact factor for *Liquid Crystals* increased. The 2014 impact factor is 2.486, an all time high. This is a tremendous outcome and I thank the whole liquid crystals community for its continued and enthusiastic support of the *Journal*.

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Disclosure statement

No potential conflict of interest was reported by the author.

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