

Curriculum Vitae **Joseph Edward Maclellan**

CONTACT INFORMATION

Condensed Matter Laboratory
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EDUCATION

1977–1980 : Rhodes University, Grahamstown, South Africa.
1979 *Bachelor of Science* in Physics with Electronics
and in Applied Mathematics (both with Distinction);
1980 *Bachelor of Science (Honours)* in Physics and Electronics
(with Distinction)
1981–1988 : University of Colorado, Boulder, Colorado, USA.
1983 *Master of Science* in Physics;
1988 *Ph.D.* in Physics
Thesis Title: “*Switching Dynamics and Structures of
Ferroelectric Liquid Crystals in the Surface-Stabilized Geometry*”
Advisor : Noel A. Clark

AWARDS

1980 *Basil Schonland Prize in Physics* (from Rhodes University);
1980 *Associated Electronics Prize* (from Rhodes University);
1980 *Doctor's (or Master's) Degree Scholarship* (from Rhodes University)
1988 *Humboldt Postdoctoral Fellowship*
1991 *NATO Collaborative Research Grant*
2007 *EU Erasmus Mundus Scholarship*

PRESENT POSITION

Professor Attendant Rank

Physics Department, University of Colorado at Boulder

EMPLOYMENT HISTORY

- 2002–2007 **Associate Professor Attendant Rank**
Physics Department, University of Colorado at Boulder;
- 1997–2002 **Assistant Professor Attendant Rank**
Physics Department, University of Colorado at Boulder;
- 1994–1997 **Senior Research Associate / Lecturer**
Physics Department, University of Colorado at Boulder;
- 1993 **Consultant** (part time), AT&T Bell Laboratories,
Murray Hill, New Jersey;
- 1990–1992 **Research Scientist**, Institute of Physical Chemistry,
University of Mainz, Federal Republic of Germany;
- 1988–1990 **Humboldt Postdoctoral Fellow** with Helmuth Möhwald
at the Institute of Physical Chemistry, University of Mainz
(initial 9 months with Joachim Bargon at the University of Bonn)
- 4–7 1988 **Research Assistant** (“Wissenschaftliche Hilfskraft”),
Institute of Physical Chemistry, University of Bonn, Germany;
- 1982–1988 **Research Assistant** in the Condensed Matter Laboratory,
Department of Physics, University of Colorado at Boulder;
- 1981–1982 **Graduate Teaching Assistant**,
Department of Physics, University of Colorado;
- 1981 **Scientist** in the Research Department of African Explosives
and Chemicals Industries (AECI), Johannesburg, South Africa;
- 1979 **Electronics Technician** at Siemens AG, Johannesburg (summer job);
- 1977, 1978 **Undergraduate Research Assistant** in geological and chemical research labora
at Rhodes University, South Africa (summer jobs).

PROFESSIONAL AND SERVICE ACTIVITIES

- Associate Director of Education and Outreach of the Soft Materials Research Center, the University of Colorado MRSEC (2005 – present)
- Physics Department Undergraduate Faculty Mentor (2016 –)
- Member of the Editorial Board of *Physical Review E* (2009 – 2011)
- Co-organizer of international Boulder Workshops on Banana-Shaped Liquid Crystals (2002), Directing Nanoscale Organization in Organic Photovoltaics: Liquid Crystals for Renewable Energy (2010), the Frontiers of Soft Matter Symposium (2012), and the Frontiers of Photoactive Soft Matter Workshop (2017).
- Co-organizer of Research Experience for Undergraduates (REU) program of the Soft Materials Research Center (2010–present)
- Scientific Secretary of 21st International Liquid Crystal Conference (Keystone 2006)
- Co-organizer of NSF-Research Experience for Teachers (RET) program at University of Colorado (2004–2007)
- Advisory Board of the International Liquid Crystal Society (2002–2012)
- Associate Editor *e-LC: Electronic Liquid Crystal Communications* (on-line journal) (2002–)
- creator and co-presenter annual Liquid Crystal Wizard Shows (1998–)
- Advisory Board of *LiqCryst*
(liquid crystal database project based in Germany)
- Member American Physical Society (1983–)
- Member International Liquid Crystal Society (1986–)
- Co-founder of Instec Inc. of Boulder (1986)
(precision microscope hotstage manufacturer)
- Fellow Soft Materials Research Center (1998–)
- Fellow Materials Science & Engineering Program (2012–)

CURRENT TEACHING & ADVISING ACTIVITIES

- Undergraduate Students: Ian Cadenhead (2016 –), Evan Dutch (2016–), Eric Minor (2017–)
- Doctoral Student Advising: Xi Chen (2017–), Adam Green (2016–), Rayshan Visvanathan (2016–), Michael Tuchband (2013–)
- Postdoctoral Student: Min Shuai (Research Associate, 2016–)

PAST TEACHING & ADVISING ACTIVITIES

- Classroom Instruction: Light and Color (Physics 1230) in Fall 2016 and Summer 2017; Junior Laboratory (Electronics for the Physical Sciences, Physics 3330) in Fall 2012; Light and Color (Physics 1230) in Spring 2009; Physics of Sound and Music (Physics 1240) in Fall 2003, Spring 2005 and Fall 2010; Introductory Physics Laboratory (Physics 1140) in Spring 2000 and Spring 2002; co-taught graduate Introduction to Liquid Crystal Physics (Physics 7810) in Fall 2000.
- Highschool Students: Karun Rao (Fairview High School, Spring 2011), Jesus Savala (Arrupe Jesuit High School, Denver, Spring 2010)
- Undergraduate Students: Kate Wachs (2013 –2014), Balazs Horanyi (2012–2013), Kyle Meienberg (2011–2013), Aaron Goldfain (2008–2011), Hons. *Summa cum Laude* (2012)), Sam McDowell (UROP 2009-2010), Markus Atkinson (UROP 2009-2010, Hons. *Summa cum Laude* (2010)), Ramsey Majzoub (2007–8), Jason Young (DLA 2007–8), Christopher Dodson (2006–7), Suzanne Lieber (Undergraduate Research Assistant, 2005–2006); Gabriel Price (Undergraduate Research Assistant, 2000–2004), Kimberley Cabbagestalk (WAESO, Fall 2002–Fall 2003); Eric Hoffman (REU, Summer 2002); Dorothy Wang (SMART, Summer 2001); Sarah Nagel (REU, Summer 2001); Joel Murray (REU, Summer 1999); and Olu Adesola (WAESO, Spring 1998)
- Independent Study Students: Evan Dutch (Fall 2017), Andy Bordon (Spring 2010), Kyllie Pobar (Physics, Spring 2009), Charles Adkison (Physics, Spring 1999), Gabriel Price (Physics, Fall 2001)
- Graduate Interns (from Strasbourg Technical University, France): Aurelien Fritz (2002–2003); Benjamin Mavel (2001–2002); Jerome Reysz (2000–2001); David Muller (1999–2000); Christophe Schneider (1998–1999); Fabien Durringer (1997–1998)
- Graduate Students: Yue Shi (PhD 2014), Yongqiang Shen (PhD 2013), Ali Alshomrany (PhD 2013); Dong Chen (PhD 2012); Duong Nguyen (PhD 2011); Chenhui Zhu (PhD 2009); Chris Jones (PhD 2007), Apichart Pattanaporkratana (PhD 2007); Guan-Jiu Fang (PhD 2007); Titular Advisor of Vishal Shah (NIST) (PhD 2006); Nattaporn Chattham (PhD 2004), Danielle Bundy (Graduate Research Assistant, 1998–2000); Darren Link (PhD 1999)
- Postdoctoral Students: Chenhui Zhu (2009–10), Michi Nakata (2004–2006), Daeseung Kang(1998–2000); Qi Jiang (1995–1997)

PUBLICATIONS

126. “New SmAP_F Mesogens Designed for Analog Electrooptics Applications,” E. Korblova, E. Guzman, J. E. Maclennan, M. A. Glaser, R. Shao, E. Garcia, Y. Shen, R. Visvanathan, N. A. Clark, and D. M. Walba, *Materials* **10** (11), 1284 (2017). DOI: 10.3390/ma10111284
125. “Two-Dimensional Island Emulsions in Ultrathin, Freely-Suspended Smectic Liquid Crystal Films,” S. P. Radzihovsky, C. Cranfill, Z. Nguyen, C. S. Park, J. E. Maclennan, M. A. Glaser, and N. A. Clark, *Soft Matter* **13** (37), 6314 (2017). DOI: 10.1039/C7SM01584D
124. “Effect of Conformational Chirality on Optical Activity Observed in a Smectic of Achiral, Bent-Core Molecules,” Y. Shi, Z. Sun, R. Chen, C. Zhu, R. K. Shoemaker, E. Tsai, D. M. Walba, M. A. Glaser, J. E. Maclennan, D. Chen, and N. A. Clark, *Journal of Physical Chemistry B* **121** (28), 6944–6950 (2017). DOI: 10.1021/acs.jpcc.7b04033
123. “The heliconical nematic twist-bend phase from ‘classic’ bent-core benzylideneanilines with oligomethylene cores,” A. N. Scarbrough, M. R. Tuchband, E. D. Korblova, R. Shao, Y. Shen, J. E. Maclennan, M. A. Glaser, N. A. Clark, and D. M. Walba, *Molecular Crystals and Liquid Crystals*, **647** (1), 430–438, (2017). DOI: 10.1080/15421406.2017.1290396
122. “Realization of hydrodynamic experiments on quasi-2D liquid crystal films in microgravity,” N. A. Clark, A. Eremin, M. A. Glaser, N. Hall, K. Harth, C. Klopp, J. E. Maclennan, C. S. Park, R. Stannarius, P. Tin, W. N. Thurmes, T. Trittel, *Advances in Space Research* **60**, 737–751 (2017). DOI: 10.1016/j.asr.2017.04.014
121. “Aggregation-driven, reentrant isotropic phase in a smectic liquid crystal material,” J. G. Fernsler, M. A. Glaser, R. Shao, D. A. Coleman, J. E. Maclennan, D. R. Link, C. Chang, K. Lanham, D. Walba, C. Boyer, J. A. Zasadzinski, and N. A. Clark, *Liquid Crystals* **44** (5), 769–783 (2017). DOI: 10.1080/02678292.2016.1240835
120. “Active microrheology of smectic membranes,” Z. Qi, K. Ferguson, Y. Sechrest, T. Munsat, C. S. Park, M. A. Glaser, J. E. Maclennan, N. A. Clark, T. Kuriabova and T. R. Powers, *Physical Review E* **95** (1), 022702 [9 pages] (2017). DOI: 10.1103/PhysRevE.95.022702
119. “Hydrodynamic Interactions in Freely Suspended Liquid Crystal Films,” T. Kuriabova, T. R. Powers, Z. Qi, A. Goldfain, C. S. Park, M. A. Glaser, J. E. Maclennan, and N. A. Clark, *Physical Review E* **94** (5), 052701 [14 pages] (2016). DOI: 10.1103/PhysRevE.94.052701
118. “Manipulating the twist sense of helical nanofilaments of bent-core liquid crystals using rod-shaped, chiral mesogenic dopants,” M. R. Tuchband, D. Chen, B. Horanyi, M. Shuai, Y. Shen, E. Korblova, D. M. Walba, N. Kapernaum, F. Giesselmann, M. A. Glaser, J. E. Maclennan, and N. A. Clark, *Liquid Crystals* **43** (8), 1083–1091 (2016). DOI: 10.1080/02678292.2016.1159345

117. "Resonant carbon K-edge soft x-ray scattering from lattice-free heliconical molecular ordering: soft dilative elasticity of the twist-bend liquid crystal phase," C. Zhu, M. R. Tuchband, A. Young, M. Shuai, A. Scarbrough, D. M. Walba, J. E. Maclennan, C. Wang, A. Hexemer, and N. A. Clark, *Physical Review Letters* **116** (14), 147803 [6 pages] (2016). DOI: 10.1103/PhysRevLett.116.147803
116. "Experimental realization of an incompressible Newtonian fluid in two dimensions," Z. Qi, C. S. Park, M. A. Glaser, J. E. Maclennan, and N. A. Clark, *Physical Review E* **93** (1), 012706 [7 pages] (2016). DOI: 10.1103/PhysRevE.93.012706
115. "Spontaneous Liquid Crystal and Ferromagnetic Ordering of Colloidal Magnetic Nanoplates," M. Shuai, A. Klittnick, Y. Shen, G. P. Smith, M. R. Tuchband, C. Zhu, R. G. Petschek, A. Mertelj, D. Lisjak, M. Čopič, J. E. Maclennan, M. A. Glaser, and N. A. Clark, *Nature Communications* **7**, 10394 [8 pages] (2016). DOI: 10.1038/ncomms10394
114. "Diastereomeric liquid crystal domains at the mesoscale," D. Chen, M. Tuchband, B. Horanyi, E. Korblova, D. M. Walba, M. A. Glaser, J. E. Maclennan, and N. A. Clark, *Nature Communications* **6**, 7763 [10 pages] (2015). DOI: 10.1038/ncomms8763
113. "Nanoparticle Aggregation and Fractal Growth in Fluid Smectic Membranes," K. Meienberg, T. Malinina, Z. Nguyen, C. S. Park, M. A. Glaser, N. A. Clark, and J. E. Maclennan, *Molecular Crystals and Liquid Crystals* **611**, 14–20 (2015). DOI:10.1080/15421406.2015.1027990
112. "Probing and controlling liquid crystal helical nanofilaments," C. Zhu, C. Wang, A. Young, F. Liu, I. Gunkel, D. Chen, D. Walba, J. Maclennan, N. Clark, and A. Hexemer, *Nano Letters* **15** (5), 3420-3424 (2015). DOI: 10.1021/acs.nanolett.5b00760
111. "Field alignment of bent-core smectic liquid crystals for analog optical phase modulation," Y. Shen, L. Goodhew, R. Shao, M. Moran, E. Korblova, D. Walba, N. A. Clark, J. E. Maclennan, and P. Rudquist, *Applied Physics Letters* **106** (19), 191101 (2015). DOI: 10.1063/1.4919805
110. "Chiral random grain boundary phase of achiral hockey-stick liquid crystals," D. Chen, H. Wang, M. Li, M. A. Glaser, J. E. Maclennan, and N. A. Clark, *Soft Matter* **10** (45), 9105–9109 (2014). DOI: 10.1039/c4sm01814a
109. "Mutual Diffusion of Inclusions in Freely Suspended Smectic Liquid Crystal Films," Z. Qi, Z. H. Nguyen, C. S. Park, M. A. Glaser, J. E. Maclennan, N. A. Clark, T. Kuriabova, and T. R. Powers, *Physical Review Letters* **113** (12), 128304 [5 pages] (2014). DOI: 10.1103/PhysRevLett.113.128304
108. "Phase Winding of a Nematic Liquid Crystal by Dynamic Localized Reorientation of an Azo-Based Self-Assembled Monolayer," Y. Shi, G. Fang, M. A. Glaser, J. E. Maclennan, E. Korblova, D. M. Walba, and N. A. Clark, *Langmuir* **30**, 9560-9566 (2014). DOI: 10.1021/la501983u

107. "Chiral Isotropic Sponge Phase of Hexatic Smectic Layers of Achiral Molecules," D. Chen, Y. Shen, J. Agüero, E. Korblova, D. M. Walba, N. Kapernaum, F. Gieselmann, J. Watanabe, J. E. MacLennan, M. A. Glaser, and N. A. Clark, *ChemPhysChem* **15** (7), 1502–1507 (2014). DOI: 10.1002/cphc.201300912
106. "Twist-bend heliconical chiral nematic liquid crystal phase of an achiral rigid bent-core mesogen", D. Chen, M. Nakata, R. Shao, M. R. Tuchband, M. Shuai, U. Baumeister, W. Weissflog, D. M. Walba, M. A. Glaser, J. E. MacLennan, and N. A. Clark, *Physical Review E* **89** (2), 022506 [5 pages] (2014). DOI: 10.1103/PhysRevE.89.022506
105. "Spiral layer undulation defects in B7 liquid crystals," D. Chen, D. K. Yoon, J. E. MacLennan, M. A. Glaser, E. Korblova, D. M. Walba, N. Gimeno, M. Blanca Ros, R. Deb, N. V. S. Rao, and N. A. Clark, *Soft Matter* **9**, 11303 (2013). DOI: 10.1039/c3sm51905h
104. "Generalized Langevin-Debye Model of the Field-Dependence of Tilt, Birefringence, and Polarization Current near the De Vries Smectic A*Smectic C* Liquid Crystal Phase Transition," Y. Shen, L. Wang, R. Shao, T. Gong, C. Zhu, H. Yang, J. E. MacLennan, D. M. Walba, and N. A. Clark, *Physical Review E* **88** (6), 062504 [10 pages] (2013). DOI: 10.1103/PhysRevE.88.062504
103. "Topography of bent-core liquid crystals at the air/liquid crystal interface," D. Chen, R. Shao, J. E. MacLennan, M. A. Glaser, E. Korblova, D. M. Walba, N. Gimeno, M. Blanca Ros, and N. A. Clark, *Liquid Crystals* **40** (12), 1730-1735 (2013). DOI: 10.1080/02678292.2013.839832
102. "Chiral heliconical ground state of nanoscale pitch in a nematic liquid crystal of achiral molecular dimers," D. Chen, J. H. Porada, J. B. Hooper, A. Klitnick, Y. Shen, M. R. Tuchband, E. Korblova, D. Bedrov, D. M. Walba, M. A. Glaser, J. E. MacLennan, and N. A. Clark, *PNAS* **110**, 15931-15936 (2013). DOI:10.1073/pnas.1314654110
101. "Nanoconfinement of guest materials by helical nanofilament networks of bent-core mesogens," D. Chen, C. Zhu, H. Wang, J. E. MacLennan, M. A. Glaser, E. Korblova, D. M. Walba, J. A. Rego, E. A. Soto-Bustamante, and N. A. Clark, *Soft Matter* **9**, 462–471 (2013).
100. "Athermal photofluidization of glasses," G. J. Fang, J. E. MacLennan, Y. Yi, M. A. Glaser, M. Farrow, E. Korblova, D. M. Walba, T. E. Furtak, and N. A. Clark, *Nature Communications* **4**, 1521 [10 pages] (2013). DOI: 10.1038/ncomms2483
99. "Transitions between paraelectric and ferroelectric phases of bent-core smectic liquid crystals in the bulk and in thin freely suspended films," A. Eremin, M. Floegel, U. Kornek, S. Stern, R. Stannarius, H. Nádasi, W. Weissflog, C. Zhu, Y. Shen, C. S. Park, J. MacLennan, and N. Clark, *Physical Review E* **86** (5), 051701 (2012).
98. "Orientational Order Parameters of a de Vries-type Ferroelectric Liquid Crystal obtained by Polarized Raman Spectroscopy and X-ray Diffraction," A. Sanchez-Castillo, M. A. Osipov, S. Jagiella, Z. H. Nguyen, M. Kašpar, V. Hamplová,

- J. Maclennan, and F. Giesselmann *Physical Review E* **85**, 061703 [18 pages] (2012). DOI: 10.1103/PhysRevE.85.061703
97. “Topological Ferroelectric Bistability in a Polarization-Modulated Orthogonal Smectic Liquid Crystal,” C. Zhu, R. Shao, R. A. Reddy, D. Chen, Y. Shen, T. Gong, M. A. Glaser, E. Korblova, P. Rudquist, J. E. Maclennan, D. M. Walba, and N. A. Clark, *Journal of the American Chemical Society*, 9681-9687 **134**, 9681–9687 (2012). DOI: 10.1021/ja3009314
96. “Electro-Optic Response of the Anticlinic, Antiferroelectric Liquid Crystal Phase of a Biaxial Bent-Core Molecule with Tilt Angle near 45° ,” M. Nakata, D. Chen, R. Shao, E. Korblova, J. E. Maclennan, D. M. Walba, and N. A. Clark, *Physical Review E* **85**, 031704 (2012). DOI: 10.1103/PhysRevE.85.031704
95. “Structure of the B4 Liquid Crystal Phase near a Glass Surface,” D. Chen, M-S. Heberling, M. Nakata, L. E. Hough, J. E. Maclennan, M. A. Glaser, E. Korblova, D. M. Walba, J. Watanabe, and N. A. Clark, *ChemPhysChem* **15**, 155–159 (2012). DOI: 10.1002/cphc.201100589
94. “Two-dimensional Microrheology of Freely-Suspended Liquid Crystal Films,” A. Eremin, S. Baumgarten, K. Harth, R. Stannarius, Z. H. Nguyen, A. Goldfain, C. S. Park, J. E. Maclennan, M. A. Glaser, and N. A. Clark, *Physical Review Letters* **107** (26), 268301 (2011). DOI: 10.1103/PhysRevLett.107.268301
93. “Direct Observation of Two-Dimensional Nematic and Smectic Ordering in Freely Suspended Films of a Bolaamphiphilic Liquid Crystal,” N. Chattham, X. H. Cheng, J. Limtrakul, C. Tschierske, J. E. Maclennan, and N. A. Clark, *Soft Matter* **7** (21), 9978–9982 (2011). DOI: 10.1039/c1sm05873h
92. “Chirality-Preserving Growth of Helical Filaments in the B4 Phase of Bent-Core Liquid Crystals,” D. Chen, J. E. Maclennan, R. Shao, D. K. Yoon, H. Wang, E. Korblova, D. M. Walba, M. A. Glaser, and N. A. Clark, *Journal of the American Chemical Society* **133**, 12656–12663 (2011). DOI: 10.1021/ja203522
91. “Design and synthesis of an achiral ferroelectric smectic liquid crystal,” E. Korblova, D. Walba, T. Gong, A. Reddy, C. Zhu, R. Shao, J. Maclennan, M. Glaser, and N. Clark, *Proc. SPIE* **8114**, (1), 81140X [9 pages] (2011). DOI: 10.1117/12.894152
90. “Photodegradation of Azobenzene-Based Self-assembled Monolayers Characterized by In-Plane Birefringence,” G. Fang, Y. Shi, J. E. Maclennan, D. M. Walba, and N. A. Clark, *Langmuir* **27**, 10407-10411 (2011). DOI: 10.1021/la201306a
89. “Effect of Concentration on the Photo-Orientation and Relaxation Dynamics of Self-Assembled Monolayers of Mixtures of an Azobenzene-Based Triethoxysilane with Octyltriethoxysilane,” G. Fang, N. Koral, C. Zhu, Y. Yi, M. A. Glaser, J. E. Maclennan, N. A. Clark, E. Korblova, and D. M. Walba, *Langmuir* **27**, 3336–3342 (2011). DOI: 10.1021/la104457v
88. “Effective conductivity due to continuous polarization reorientation in fluid ferroelectrics,” Y. Shen, T. Gong, R. Shao, E. Korblova, J. E. Maclennan, D. M. Walba, and N. A. Clark, *Physical Review E* **84**, 020701(R) (2011). DOI: 10.1103/PhysRevE.84.020701

87. “Cooperative Liquid-Crystal Alignment Patterns Generated by Overlaid Topography,” Y. Yi, J. E. Maclennan, and N. A. Clark, *Physical Review E* **83**, 051708 (2011). DOI: 10.1103/PhysRevE.83.051708
86. “Dynamics of cis isomers in highly sensitive amino-azobenzene monolayers: the effect of slow relaxation on photo-induced anisotropy,” Y. Yi, G. Fang, J. E. Maclennan, N. A. Clark, J. Dahdah, T. E. Furtak, K. Kim, M. J. Farrow, E. Korblova, and D. M. Walba, *Journal of Applied Physics* **109**, 103521 (2011). DOI: 10.1063/1.3587572
85. “Interface Structure of the Dark Conglomerate Phase,” D. Chen, Y. Shen, C. Zhu, L. E. Hough, N. Gimeno, M. A. Glaser, J. E. Maclennan, M. Blanca Ros, and N. A. Clark, *Soft Matter* **7**, 1879–1883 (2011). DOI: 10.1039/c0sm01009j
84. “Spontaneous Ferroelectric Order in a Bent-Core Liquid Crystal of Fluid Orthorhombic Smectic Layers,” R. A. Reddy, C. Zhu, R. Shao, E. Korblova, T. Gong, Y. Shen, E. Garcia, M. A. Glaser, J. E. Maclennan, D. M. Walba, and N. A. Clark, *Science* **332** (6025), 72–77 (2011). DOI: 10.1126/science.1197248
83. “Crossover between 2D and 3D fluid dynamics in the diffusion of islands in ultrathin freely suspended smectic films,” Z. H. Nguyen, M. Atkinson, C. S. Park, J. E. Maclennan, M. A. Glaser, and N. A. Clark, *Physical Review Letters* **105** (26), 268304 (2010). DOI: 10.1103/PhysRevLett.105.268304
82. “Photo-Reversible Liquid Crystal Alignment using Azobenzene-Based Self-Assembled Monolayers: Comparison of the Bare Monolayer and Liquid Crystal Reorientation Dynamics,” G. Fang, Y. Shi, J. E. Maclennan, N. A. Clark, M. J. Farrow, and D. M. Walba, *Langmuir* **26**, 17482–17488 (2011). DOI: 10.1021/la102788j
81. “Pre-transitional orientational ordering of a calamitic liquid crystal by helical nanofilaments of a bent-core mesogen,” D. Chen, C. Zhu, R. Shoemaker, E. Korblova, D. Walba, M. Glaser, J. Maclennan, and N. Clark, *Langmuir* **26**, 15541–15545 (2010). DOI: 10.1021/la101849h
80. “High Extinction Polarimeter for Precision Measurement of the In-Plane Birefringence of Molecular Monolayers,” G. Fang, J. Maclennan, and N. Clark, *Langmuir* **26**, 11686–11689 (2010). DOI: 10.1021/la101117n
79. “Triclinic Fluid Order,” N. Chattham, E. Korblova, R. Shao, D. M. Walba, J. E. Maclennan, and N. A. Clark, *Physical Review Letters* **104** (6), 067801 (2010). DOI: 10.1103/PhysRevLett.104.067801
78. “Nanophase segregation in binary mixtures of a bent-core and a rodlike liquid-crystal molecule,” C. Zhu, D. Chen, Y. Shen, C. D. Jones, M. A. Glaser, J. E. Maclennan, and N. A. Clark, *Physical Review E* **81**, 011704 (2010). DOI: 10.1103/PhysRevE.81.011704
77. “De Gennes’ Triclinic Smectics - Not So Far-fetched After All,” N. Chattham, R. Shao, E. Korblova, D. M. Walba, J. E. Maclennan, and N. A. Clark, *Liquid Crystals* **36** (10–11), 1309–1317 (2009). DOI: 10.1080/02678290903306458

76. "Modeling dipolar and quadrupolar defect structures generated by chiral islands in freely suspended liquid crystal films," N. M. Silvestre, P. Patrício, M. M. Telo da Gama, A. Pattanaporkratana, C. S. Park, J. E. MacLennan, and N. A. Clark, *Physical Review E* **80** (4), 041708 (2009). DOI: 10.1103/PhysRevE.80.041708
75. "Chiral Isotropic Liquids from Achiral Molecules," L. E. Hough, M. Spannuth, M. Nakata, D. A. Coleman, C. D. Jones, G. Dantlgraber, C. Tschierske, J. Watanabe, E. Körblova, D. M. Walba, J. E. MacLennan, M. A. Glaser, and N. A. Clark, *Science* **325**, 452–456 (2009). DOI: 10.1126/science.1170028
74. "Topographic-pattern-induced homeotropic alignment of liquid crystals," Y. Yi, G. Lombardo, N. Ashby, R. Barberi, J. E. MacLennan, and N. A. Clark, *Physical Review E* **79**, 041701 (2009). DOI: 10.1103/PhysRevE.79.041701
73. "Organization of liquid crystals on submicron scale topographic patterns with fourfold symmetry prepared by thiolene photopolymerization-based nanoimprint lithography," Y. W. Yi, V. Khire, C. N. Bowman, J. E. MacLennan, and N. A. Clark, *Journal of Applied Physics* **103**, 093518 (2008). DOI: 10.1063/1.2913317
72. "Method for characterizing self-assembled monolayers as antirelaxation wall coatings for alkali vapor cells," Y. W. Yi, H. G. Robinson, S. Knappe, J. E. MacLennan, C. D. Jones, C. Zhu, N. A. Clark, and J. Kitching, *Journal of Applied Physics* **104**, 023534 (2008). DOI: 10.1063/1.2958329
71. "V-shaped switching ferroelectric liquid crystal structure stabilized by dielectric surface layers," A. Hammarquist, K. D'Havé, M. Matuszczyk, N. A. Clark, J. E. MacLennan, and P. Rudquist, *Physical Review E* **77**, 031707 (2008) (8 pages). DOI: 10.1103/PhysRevE.77.031707
70. "Self-Organization of Bouncing Oil Drops: Two-Dimensional Lattices and Spinning Clusters," S. I. Lieber, M. C. Hendershott, A. Pattanaporkratana, J. E. MacLennan, *Physical Review E* **75**, 056308 (2007) (5 pages). DOI: 10.1103/PhysRevE.75.056308
69. "Electric-Field-Driven Deracemization," A. Kane, R.-F. Shao, J. E. MacLennan, L. Wang, D. M. Walba, and N. A. Clark, *ChemPhysChem* **8**, 170–174 (2007). DOI: 10.1002/cphc.200600463
68. "Direct Measurement of Interaction Forces between Islands on Freely Suspended Smectic C Films using Multiple Optical Tweezers," A. Pattanaporkratana, C. S. Park, J. E. MacLennan, and N. A. Clark, *Ferroelectrics* **344**, 71 (2006), and in *www.e-lc.org*. DOI: 10.1080/00150190600966862
67. "Director Structures in Achiral Smectic C Liquid Crystal Cells: Field Induced Twist Domain Nucleation," C. D. Jones, R. -F. Shao, A. G. Rappaport, J. E. MacLennan, N. A. Clark, E. Körblova and D. M. Walba, *Liquid Crystals* **33**, 25–32 (2006). DOI: 10.1080/02678290500380567
66. "Electric Field Induced Chirality Flipping in Smectic Liquid Crystals," M. Nakata, R.-F. Shao, J. E. MacLennan, W. Weissflog, and N. A. Clark, *Physical Review Letters* **96**, 067802 (2006). DOI: 10.1103/PhysRevLett.96.067802

65. "Effect of High Spontaneous Polarization on Defect Structures and Orientational Dynamics of Tilted Chiral Smectic Freely Suspended Films," D. R. Link, N. Chattham, J. E. MacLennan, N. A. Clark, *Physical Review E* **71** (2), 021704 (2005)(9 pages). DOI: 10.1103/PhysRevE.71.021704
64. "Giant-block twist grain boundary smectic phases," J. Fernsler, L. Hough, R.-F. Shao, J. E. MacLennan, L. Navailles, M. Brunet, N. V. Madhusudana, O. Mondain-Monval, C. Boyer, J. Zasadzinski, J. A. Rego, D. M. Walba, and N. A. Clark, *PNAS* **40**, 14191-14196 (2005). DOI: 10.1073/pnas.0500664102
63. "Manipulation of Islands on Freely Suspended Smectic Films and Bubbles using Optical Tweezers," A. Pattanaporkratana, C. S. Park, J. E. MacLennan, and N. A. Clark, *Ferroelectrics* **310**, 275 (2004), and in *www.e-lc.org*. DOI: 10.1080/00150190490510537
62. "Field Control of the Surface Electroclinic Effect in Chiral Smectic-A Liquid Crystals," J. E. MacLennan, D. Muller, R.-F. Shao, D. Coleman, D. J. Dyer, D. M. Walba, and N. A. Clark, *Physical Review E* **69**, 061716 (2004) (6 pages). DOI: 10.1103/PhysRevE.69.061716
61. "Polarization-Modulated Smectic Liquid Crystal Phases," D. A. Coleman, J. Fernsler, N. Chattham, M. Nakata, Y. Takanishi, E. Korblova, D. R. Link, R.-F. Shao, W. G. Jang, J. E. MacLennan, O. Mondainn-Monval, C. Boyer, W. Weissflog, G. Pelzl, L.-C. Chien, J. Zasadzinski, J. Watanabe, D. M. Walba, H. Takezoe, and N. A. Clark, *Science* **301**, 1204–1211 (2003). DOI: 10.1126/science.1084956
60. "Control of Molecular Orientation in Electrostatically Stabilized Ferroelectric Liquid Crystals," D. Coleman, D. Mueller, N. A. Clark, J. E. MacLennan, R. F. Shao, S. Bardon, and D. M. Walba, *Physical Review Letters* **91**, 175505 (2003) (4 pages). DOI: 10.1103/PhysRevLett.91.175505
59. "Novel Thickness-Dependent Thermal Behavior and Anticlinic Coupling in Chiral Smectic Free-Standing Liquid Crystal Films," P. J. Wu, C. Y. Chao, C. R. Lo, M. Veum, D. R. Link, J. E. MacLennan, and N. A. Clark, *Ferroelectrics* **277**, 511–520 (2002). DOI: 10.1080/00150190190027276
58. "Transition Moment Orientation and Rotational Bias of Three Carbonyl Groups in Large-Polarization FLCs Observed by Polarized FT-IR," J. Matsushima, Y. Takanishi, K. Ishikawa, H. Takezoe, A. Fukuda, C. S. Park, W. G. Jang, K. H. Kim, J. E. MacLennan, M. A. Glaser, N. A. Clark, and K. Takanashi, *Liquid Crystals*, **29** 27–37 (2002). DOI: 10.1080/02678290110039525
57. "Structure and Dynamics of Ferroelectric Liquid Crystal Cells Exhibiting Thresholdless Switching," M. Čopič, J. E. MacLennan, and N. A. Clark, *Physical Review E* **65**, 021708 (2002) (9 pages). DOI: 10.1103/PhysRevE.65.021708
56. "Electro-Optic Characteristics of de Vries Tilted Smectic Liquid Crystals: Analog Behavior in the Smectic A* and Smectic C* Phases," N. A. Clark, T. Bellini, R.-F. Shao, D. Coleman, S. Bardon, D. R. Link, J. E. MacLennan, X.-H. Chen, M. D. Wand, D. M. Walba, P. Rudquist and S. T. Lagerwall, *Applied Physics Letters* **80**, 4097–4099 (2002). DOI: 10.1063/1.1480472

55. "A Molecular Dynamics Simulation Study of the Switching Dynamics of a Nematic Liquid Crystal under an Applied Electrical Field," P. Tian, D. Bedrov, G. D. Smith, M. Glaser, and J. E. Maclennan, *Journal of Chemical Physics* **117**, 9452–9459 (2002). DOI: 10.1063/1.1516190
54. "Unusual Layer Number Dependent Thermal Behavior and Tilt Ordering in Freely Suspended Films of a Chiral Smectic," C. Y. Chao, C. R. Lo, P. J. Wu, Y. H. Liu, D. R. Link, J. E. Maclennan, N. A. Clark, M. Veum, C. C. Huang, and J. T. Ho, *Physical Review Letters* **86**, 4048–4051 (2001). DOI: 10.1103/PhysRevLett.86.4048
53. "Giant surface electroclinic effect in a chiral smectic A liquid crystal," R.-F. Shao, J. E. Maclennan, N. A. Clark, D. J. Dyer, and D. M. Walba, *Liquid Crystals* **28**, 117–123 (2001).
52. "Spontaneous Formation of Horizontal Chevrons in Smectic-C* Liquid Crystals," G. Strangi, D. A. Coleman, J. E. Maclennan, M. Čopič, and N. A. Clark, *Applied Physics Letters* **78**, 1532–1534 (2001). DOI: 10.1063/1.1352661
51. "Influence of Ions on the 'V-Shaped' Electro-Optic Response of Ferroelectric Liquid Crystals," M. Čopič, J. E. Maclennan, and N. A. Clark, *Physical Review E* **63**, 031703 (5 pages) (2001). DOI: 10.1103/PhysRevE.63.031703
50. "Electro-Optic Behavior of Liquid Crystal-filled Silica Opal Photonic Crystals," D. Kang, J. E. Maclennan, N. A. Clark, A. A. Zakhidov, and R. Baughman, *Physical Review Letters* **86**, 4052–4055 (2001). DOI: 10.1103/PhysRevLett.86.4052
49. "Design of Smectic Liquid Crystal Phases using Layer Interface Clinicity," D. M. Walba, E. Korblova, R. F. Shao, J.E. Maclennan, D. R. Link, M. A. Glaser, and N. A. Clark, in *Anisotropic Organic Materials - Approaches to Polar Order*, R. Glaser and P. Kaszynski, Eds., American Chemical Society (Washington, 2001) pp. 268–281.
48. "Biaxial Model of the Surface Anchoring of Bent-Core Smectic Liquid Crystals," J.E. Maclennan, N. A. Clark, and D. M. Walba, *Physical Review E* **64**, 031706 (2001) (6 pages). DOI: 10.1103/PhysRevE.64.031706
47. "Ring Pattern Dynamics in Smectic-C* and Smectic-C_A* Freely Suspended Liquid Crystal Films," D. R. Link, L. Radzihovsky, G. Natale, J. E. Maclennan, N. A. Clark, M. Walsh, S. S. Keast, and M. E. Neubert, *Physical Review Letters* **84**, 5772–5775 (2000). DOI: 10.1103/PhysRevLett.84.5772
46. "Electrostatics and the Electro-Optic behavior of Chiral Smectics C: 'Block' Polarization Screening of Applied Voltage and 'V-Shaped' Switching," N. A. Clark, D. Coleman, and J. E. Maclennan, *Liquid Crystals* **27**, 985–990 (2000).
45. "Symmetric Thresholdless Electro-Optic Effects in Liquid Crystals," S. T. Lagerwall, P. Rudquist, N. A. Clark, and J. E. Maclennan, *Digest of Technical Papers of the Society for Information Display International Symposium*, 59–63 (2000).

44. "A Ferroelectric Liquid Crystal Conglomerate Composed of Racemic Molecules," D. M. Walba, E. Körblova, R. Shao, J. E. MacLennan, D. R. Link, M. A. Glaser, and N. A. Clark, *Science* **288**, 2181 (2000). DOI: 10.1126/science.288.5474.2181
43. "Supermolecular Stereochemistry in Ferroelectric Liquid Crystals," D. M. Walba, E. Körblova, R. Shao, J. E. MacLennan, D.R. Link, M. A. Glaser, and N. A. Clark, *Journal of Physical Organic Chemistry* **13**, 830–836 (2000).
42. "The Hysteretic Behavior of 'V-Shaped Switching' Smectic Materials," P. Rudquist, D. Krüerke, S. T. Lagerwall, J. E. MacLennan, N. A. Clark, and D. M. Walba, *Ferroelectrics* **246**, 21–33 (2000).
41. "Anticlinic Smectic-*C* Surfaces on Smectic-*A* Freely-Suspended Liquid-Crystal Films," D. R. Link, G. Natale, N. A. Clark, J. E. MacLennan, M. Walsh, S. S. Keast, and M. E. Neubert, *Physical Review Letters* **82**, 2508–2511 (1999). DOI: 10.1103/PhysRevLett.82.2508
40. "Orientation Field Fracture in a Liquid Crystal: Metastable Anticlinic Molecular Tilt in Adjacent Layers in Smectic C DOBAMBC and TFMHPOBC," D. R. Link, G. Natale, J. E. MacLennan, N. A. Clark, M. Walsh, S. S. Keast, and M. E. Neubert, *Physical Review Letters* **83**, 3665–3668 (1999). DOI: 10.1103/PhysRevLett.83.3665
39. "Unraveling the Mystery of Thresholdless Antiferroelectricity: High Contrast Analog Electrooptic Effects in Chiral Smectics C," P. Rudquist, J. P. F. Lagerwall, M. Buivydas, F. Gouda, S. T. Lagerwall, R. Shao, D. A. Coleman, S. Bardon, D. R. Link, T. Bellini, J. E. MacLennan, D. M. Walba, N. A. Clark, and X.-H. Chen, *Digest of Technical Papers of the Society for Information Display International Symposium*, 409-411 (1999).
38. "The Thresholdless Switching Mode in Chiral Smectic Liquid Crystals," S. T. Lagerwall, P. Rudquist, N. A. Clark, J. E. MacLennan, D. M. Walba. *Proceedings of the Nineteenth International Display Research Conference of the Society for Information Display*, Berlin, Germany, 409-413 (1999).
37. "Antiferroelectric Liquid Crystals from Achiral Molecules and a Liquid Conglomerate," D. M. Walba, E. Körblova, R. F. Shao, J. E. MacLennan, D. R. Link, and N. A. Clark, *Materials Research Society Symposium Proceedings* **559**, 3-14 (1999).
36. "V-Shaped Switching in Ferroelectric Liquid Crystals," J.E. MacLennan, P. Rudquist, R. Shao, D.R. Link, D.M. Walba, N.A. Clark, and S.T. Lagerwall, *Proceedings of the Society of Photo-optical Instrumentation Engineers* **3800**, 136-139 (1999).
35. "The Case of Thresholdless Antiferroelectricity: Polarization-Stabilized Twisted SmC* Liquid Crystals give V-Shaped Electro-Optic Response," P. Rudquist, J. P. F. Lagerwall, M. Buivydas, F. Gouda, S. T. Lagerwall, N. A. Clark, J. E. MacLennan, R. Shao, D. A. Coleman, S. Bardon, T. Bellini, D. R. Link, G. Natale, M. A. Glaser, D. M. Walba, M. D. Wand, X.-H. Chen, *Journal of Materials Chemistry* **9**, 1257–1261 (1999). DOI: 10.1039/a900991d

34. "Polar Electro-Optic Switching in Droplets of an Achiral Nematic Liquid Crystal," P. Rudquist, E. Körblova, D. M. Walba, R. Shao, N. A. Clark, and J. E. Maclennan, *Liquid Crystals* **26**, 1555–1561 (1999).
33. "Antiferroelectric liquid crystals from achiral molecules and a liquid conglomerate," D. M. Walba, E. Körblova, R. Shao, J. E. Maclennan, D. R. Link, N. A. Clark, in *Liquid Crystal Materials and Devices*, T. Bunning, et al., Eds., Proc. MRS **559**, 3-14 (1999).
32. "Ferroelectric smectic liquid crystals in the bent-core family: Alignment for V-shaped analog switching," D. M. Walba, E. Körblova, R. F. Shao, J. E. Maclennan, D. R. Link, N. A. Clark, in *Liquid Crystals III*, I. C. Khoo, Ed., Proc. SPIE **3800**, 21-28 (1999).
31. "V-Shaped Switching in Ferroelectric Liquid Crystals," J. E. Maclennan, P. Rudquist, R. Shao, D. R. Link, D. M. Walba, N. A. Clark, and S. T. Lagerwall, *Liquid Crystals III*, I. C. Khoo, Ed., Proc. SPIE **3800**, 136–139 (1999).
30. "Sub 100 Nanosecond Pretilted Planar-to-Homeotropic Reorientation of Nematic Liquid Crystals under High Electric Field," H. Takanashi, J. E. Maclennan, and N. A. Clark, *Japanese Journal of Applied Physics* **37**, 2587–2589 (1998). DOI: 10.1143/JJAP.37.2587
29. "Phase Behavior of Liquid Crystal Films exhibiting the Surface Smectic-L Phase," C. Y. Chao, J. E. Maclennan, J. Z. Pang, S. W. Hui, and J. T. Ho, *Physical Review E* **57**, 6757 (1998). DOI: 10.1103/PhysRevE.57.6757
28. "Relating Domain Shape to Growth Velocity Anisotropy: Inherent Symmetry of the Wulff Construction," Q. Jiang, J. E. Maclennan, and N. A. Clark, *Physical Review E* **56**, 1833–1837 (1997). DOI: 10.1103/PhysRevE.56.1833
27. "Spontaneous Formation of Macroscopic Chiral Domains in a Fluid Smectic Phase of Achiral Molecules," D. R. Link, G. Natale, R. Shao, J. E. Maclennan, N. A. Clark, E. Körblova, and D. M. Walba, *Science* **278** (5345), 1924–1927 (1997). DOI: 10.1126/science.278.5345.1924
26. "Surface-freezing Transitions and Novel Tilted Hexatic Phases in Smectic Liquid Crystal Films," C. Y. Chao, S. W. Hui, J. E. Maclennan, C. F. Chou, and J. T. Ho, *Physical Review Letters* **78**, 2581–2584 (1997). DOI: 10.1103/PhysRevLett.78.2581
25. "Liquid Crystal Outreach: the Human Nematic Experiment," J. E. Maclennan, *Liquid Crystals Today* **7**, 11 (1997).
24. "Generalized Dynamic Domain Shape Calculation in Ferroelectric Liquid Crystals," Q. Jiang, J. E. Maclennan, and N. A. Clark, *Physical Review E* **53**, 6074–6079 (1996). DOI: 10.1103/PhysRevE.53.6074
23. "Orientational Bias of Carbonyl Groups in the Chiral Smectic C Phase," W. G. Jang, C. S. Park, J. E. Maclennan, K. H. Kim, and N. A. Clark, *Ferroelectrics* **180**, 213–225 (1996).

22. "Simultaneous Observation of Electric Field Coupling to Longitudinal and Transverse Ferroelectricity in a Chiral Liquid Crystal," D. R. Link, J. E. Maclennan, and N. A. Clark, *Physical Review Letters* **77**, 2237–2240 (1996). DOI: 10.1103/PhysRevLett.77.2237
21. "Ferroelectric Liquid Crystals," J. E. Maclennan, N. A. Clark, and D. M. Walba, a chapter contributed to the CD ROM book *Liquid Crystals*, (LCI Publishers, Kent, 1996).
20. "Computer Simulation of Domain Growth in Ferroelectric Liquid Crystals," J. E. Maclennan, Q. Jiang, and N. A. Clark, *Physical Review* **E52**, 3904–3914 (1995). DOI: 10.1103/PhysRevE.52.3904
19. "Textures in Hexatic Films of Non-Chiral Liquid Crystals: Symmetry Breaking and Modulated Phases," J. E. Maclennan, U. Sohling, N. A. Clark, and M. Seul, *Physical Review E* **49** (4), 3207–3224 (1994). DOI: 10.1103/PhysRevE.49.3207
18. "Creation and Structural Comparison of Ultrathin Film Assemblies: Transferred Freely-Suspended Films and Langmuir-Blodgett Films of Liquid Crystals," G. Decher, J. Maclennan, U. Sohling, and J. Reibel, *Thin Solid Films* **210/211**, 504–507 (1992). DOI: 10.1016/0040-6090(92)90325-6
17. "Novel Stripe Textures in Non-Chiral Hexatic Liquid Crystal Films," J. E. Maclennan and M. Seul, *Physical Review Letters* **69** (14), 2082–2085 (1992). DOI: 10.1103/PhysRevLett.69.2082
16. "Solitary Waves in Ferroelectric Liquid Crystals," J. E. Maclennan, N. A. Clark, and M. A. Handschy, invited book chapter in *Solitons in Liquid Crystals*, Lui Lam and Jacques Prost, Editors, (Springer-Verlag, New York, 1992).
15. "Freely Suspended Liquid Crystal Film Transfer: A New Method of Creating Thin Smectic Films on Solid Substrates," J. Maclennan, G. Decher, and U. Sohling, *Applied Physics Letters* **59**, 917–919 (1991). DOI: 10.1063/1.106300
14. "New Amphiphilic Terphenyl Liquid Crystals for the Preparation of Highly Ordered Ultrathin Films," G. Decher, J. Maclennan, M. Straus, and U. Sohling, *Makromol. Chem., Macromol. Symp.* **46**, 313–319 (1991). DOI: 10.1002/masy.19910460144
13. "Preparation and Thermal Behavior of Freely-Suspended and Transferred Films Composed of a Single Compound, the Liquid Crystal 7O7PP," G. Decher, J. Maclennan, and J. Reibel, *Ber. Bunsenges. Physikal. Chem.* **95** 1520–1525 (1991).
12. "Highly-Ordered Ultrathin LC Multilayer Films on Solid Substrates," G. Decher, J. Maclennan, J. Reibel, and U. Sohling, *Advanced Materials* **3**, 617–619 (1991). DOI: 10.1002/adma.19910031211
11. "Visible Polarized Light Transmission Spectroscopy of the Electro-Optic Switching Behaviour of Surface Stabilized Ferroelectric Liquid Crystal Cells," Z. Zhuang, N. A. Clark, and J. E. Maclennan, *Liquid Crystals* **10**, L409–417 (1991). DOI: 10.1080/02678299108026287

10. “Thermal Fluctuation Effects in Ferroelectric Liquid Crystal Polarization Reversal: Light Scattering from a Transient Domain Wall Foam,” J. E. Maclennan and N. A. Clark, *Physical Review A* **44**, 2543–2557 (1991). DOI: 10.1103/PhysRevA.44.2543
 9. “Spontaneous Director Rotation in Freely-Suspended Films of Ferroelectric Liquid Crystal,” J. E. Maclennan, *Europhysics Letters* **13**, 435–440 (1990). DOI: 10.1209/0295-5075/13/5/010
 8. “Director Orientation in Chevron SSFLC Cells : verification of Orientational Binding at the Chevron Interface using Visible Polarized Light Transmission Spectroscopy,” J. E. Maclennan, N. A. Clark, M. A. Handschy, and M. R. Meadows, *Liquid Crystals* **7**, 753–785 (1990). DOI: 10.1080/02678299008033839
 7. “Director Reorientation Dynamics in Chevron Ferroelectric Liquid Crystal Cells,” J. E. Maclennan, M. A. Handschy, and N. A. Clark, *Liquid Crystals* **7**, 787–796 (1990). DOI: 10.1080/02678299008033840
 6. “Optical Symmetry of Ferroelectric Liquid Crystal Cells,” Z. Zhuang, N. A. Clark, and J. E. Maclennan, *Japanese Journal of Applied Physics* **29**, L2239–2242 (1990).
 5. “Device Applications of Ferroelectric Liquid Crystals: Importance of Polarization Charge Interactions,” Z. Zhuang, J. E. Maclennan, and N. A. Clark, *Liquid Crystal Chemistry, Physics, and Applications*, J. William Doane and Zvi Yaniv, Editors, Proc. SPIE **1080**, 110–114 (1989).
 4. “Director and Layer Structure of SSFLC Cells,” N. A. Clark, T. P. Rieker, and J. E. Maclennan, *Ferroelectrics* **85**, 79–97 (1988).
 3. “Switching Dynamics and Structures of Ferroelectric Liquid Crystals in the Surface Stabilized Geometry,” J. E. Maclennan and N. A. Clark, *International Conference on Raman and Luminescence Spectroscopy in Technology*, James E. Griffiths and Fran Adar, Editors, Proc. SPIE **822**, 47–51 (1987).
 2. “Solitary Waves in Ferroelectric Liquid Crystals,” J. E. Maclennan, M. A. Handschy, and N. A. Clark, *Physical Review A* **34**, 3554–3557 (1986). DOI: 10.1103/PhysRevA.34.3554
 1. “Personal-computer-based Programmable Temperature Controller for General Laboratory Applications,” J. E. Maclennan, M. R. Meadows, M. A. Handschy, N. A. Clark, *Review of Scientific Instruments* **56**, 775 (1985). DOI: 10.1063/1.1138174
- Education and Outreach :
- P1 Website created for the CU Boulder liquid crystal physics group (1995)
(at <https://bly.colorado.edu>)
- P2 Website created for the Soft Materials Research Center at the University of Colorado (1997)
(at <https://smrc.colorado.edu>)
- (updated February 1, 2018)