CURRICULUM VITAE

MARK DAVID HOLLINGSWORTH
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EDUCATION:

Ph.D., ORGANIC CHEMISTRY (1986)
YALE UNIVERSITY, NEW HAVEN, CT. 06511

BACHELOR OF ARTS IN CHEMISTRY (1979)
CARLETON COLLEGE, NORTHFIELD, MN 55057

FELLOWSHIPS AND AWARDS:

ALFRED P. SLOAN RESEARCH FELLOWSHIP (1991-3)

DISTINGUISHED DISSERTATION AWARD (IN PHYSICAL SCIENCES AND ENGINEERING, 1983-1987)
NORTHEASTERN ASSOCIATION OF GRADUATE SCHOOLS

1987 NOBEL LAUREATE SIGNATURE AWARD FOR GRADUATE EDUCATION IN CHEMISTRY (AMERICAN CHEMICAL SOCIETY)

RICHARD WOLFGANG MEMORIAL PRIZE
YALE UNIVERSITY (MAY, 1986)

NSF-NATO POSTDOCTORAL FELLOWSHIP
UNIV. OF CAMBRIDGE (1986-1987)

S.E.R.C. POSTDOCTORAL RESEARCH ASSISTANTSHIP
UNIV. OF CAMBRIDGE (1985-1986)

DOX FELLOWSHIP FOR RESEARCH IN ORGANIC CHEMISTRY
YALE UNIVERSITY (SUMMER, 1983)

MEMBERSHIPS:

SIGMA XI
KING'S COLLEGE, CAMBRIDGE
AMERICAN CHEMICAL SOCIETY
AMERICAN CRYSTALLOGRAPHIC ASSOCIATION
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

POSITIONS AND RESEARCH EXPERIENCE:

6-2006 TO 7-2006	VISITING PROFESSOR, DEPT. OF CHEMISTRY, UNIV. BORDEAUX
7-2001, 7-2002, 3-2005, 6-2006, 5-2007	VISITING PROFESSOR, DEPT. OF PHYSICS, UNIV. OF RENNES
8-98 TO PRESENT	ASSOC. PROF., CHEMISTRY DEPT., KANSAS STATE UNIV.
9-91 TO 8-98	ASST. PROF., CHEMISTRY DEPT., INDIANA UNIVERSITY
10-87 TO 8-91	ASST. PROF., CHEMISTRY DEPT., UNIVERSITY OF ALBERTA
11-85 TO 8-87	POSTDOCTORAL RESEARCH ASSISTANT AND FELLOW DEPT. OF PHYSICAL CHEMISTRY, UNIV. OF CAMBRIDGE
5-80 TO 10-85	GRADUATE STUDENT, CHEMISTRY DEPT., YALE UNIVERSITY
1-78 TO 3-79	UNDERGRADUATE, CARLETON COLLEGE

RESEARCH EXPERIENCE

CURRENT WORK AT KANSAS STATE UNIVERSITY

Research in solid-state organic chemistry with emphasis on dynamic and structural phenomena and on cooperative interactions in solid-state processes. During recent years, this work has focused on series of ferroelastic and ferroelectric inclusion compounds and salts that we have developed and on the generation of a scale of functional group interaction energies through the measurement of solid-state NMR spectra of inclusion compounds. Our work includes mechanistic studies of crystal growth and domain switching in organic single crystals and on phase transitions, and it emphasizes crystal engineering, microscopy, spectroscopy and crystallography of organic solids with specific chemical and physical properties.

UNIVERSITY OF CAMBRIDGE, 11-85 TO 8-87 (POSTDOCTORAL)

Research in solid state photochemistry emphasizing structural and dynamic characterization of reactive intermediates generated from organic molecules trapped in zeolites and inclusion compounds. I used radical pair EPR spectroscopy to study the effects of long-range stress and intra- and intermolecular substituents on solid state reactions, but I also worked solid-state photochemistry/EPR spectroscopy of acridizinium halides and X-ray crystallography.

YALE UNIVERSITY, 1980-1985 (GRADUATE)

Dissertation: Infrared Studies of CO_2 Dimers as a Probe of Local Stress in Solid State Peroxide Reactions. In this research I used the asymmetric stretching mode of CO_2 to study the structure and dynamics of CO_2 dimers photogenerated in single crystals of diacyl peroxides. This work demonstrates that motion of the intermediates is controlled by anisotropic stresses equivalent to 20-30 kbar or more. Polarized IR studies of oriented crystals and analysis of intermolecular resonant coupling were used to determine the orientations of the CO_2 molecules, while substituent and intra- and intermolecular isotope effects helped elucidate the reaction pathways.

Single crystal radical pair ESR of the ground state of the benzoyloxyl radical: This study, which built upon earlier work in our group on the ^{17}O-hyperfine anisotropy of the benzoyloxyl radical, involved measurement of the ^{13}C hfs constants of this radical in ^{13}C-1-labeled acetyl benzoyl peroxide. The ^{13}C hfs constants corroborated the earlier claim of a $^2B_2$ ground state.

Synthesis directed toward ESR studies of the norbornenyl-nortricyclyl radical rearrangement in the solid state: This project involved design and synthesis of compounds that yield spectroscopically suitable radical pairs upon photolysis. It included the development of an "all-purpose counter-radical," which has been used in the study of several different interesting radicals.

CARLETON COLLEGE, 1978-79 (UNDERGRADUATE)

With two Carleton professors, C.E. Buchwald (geologist) and J.R. Mohrig (chemist) I conducted a yearlong study of the Cannon River at Northfield, Minn. I was mainly concerned with very accurate measurement of the river's dissolved oxygen content, to see if the local sewage treatment plant's methods were in any way deficient.

CARLETON COLLEGE, 1978 (UNDERGRADUATE)

Organic chemistry research with Prof. N.S. Mills on "Y-aromaticity" of the dianion of 2-methyl- 2-butene. This research included synthesis, quenching and NMR spectroscopy of these dianions.

PUBLICATIONS:

35. B. Toudic, P. Garcia, C. Odin, P. Rabiller, C. Ecolivet, E. Collet, P. Bourges, G. J. McIntyre, M. D. Hollingsworth, T. Breczewski, "Hidden Degrees of Freedom in Aperiodic Materials," *Science*, **319**, 69-71 (Jan. 4 2008). See also P. Coppens, "A Phase Transition Hidden in Higher Dimensions (*Science*, **319**, 41-42, Jan. 4, 2008) and S. Hurtley and P. Szuromi "Motion in a Higher Plane," (*Science*, **319**, 11, Jan. 4, 2008).

34. M. D. Hollingsworth, "Molecular Recognition within One-dimensional Channels," in *Turning Points in Solid-state, Materials and Surface Science: A Book in Celebration of the Life and Work of Sir John Meurig Thomas*," K. D. M Harris, P. P. Edwards, Eds., The Royal Society of Chemistry, Cambridge, 2007, pp. 346-361.

33. M. D. Hollingsworth, J. A. Swift, B. Kahr, "J. Michael McBride at 65 - An Appreciation," *Cryst. Growth Des.*, **5**, 2022-2035 (2005). A Perspective with 103 references for the Special Issue in honor of J. Michael McBride.

32. M. D. Hollingsworth, M. L. Peterson, J. R. Rush, M. E. Brown, M. J. Abel, A. A. Black, M. Dudley, B. Raghothamachar, U. Werner-Zwanziger, E. J. Still, J. A. Vanecko, "Memory and Perfection in Ferroelastic Inclusion Compounds," *Cryst. Growth Des.*, **5**, 2100-2116 (2005).

31. M. D. Hollingsworth and M. L. Peterson, "Twinning, Epitaxy, and Domain Switching in Ferroelastic Inclusion Compounds," *Proceedings of the NASA Microgravity Materials Science Conference 2002*, D. Gillies, N. Ramachandran, K. Murphy, D. McCauley, N. Bennett, eds., 283-288, Feb. 2003.

30. M. D. Hollingsworth, "Crystal Engineering: from Structure to Function," an invited Viewpoint for *Science*, **295**, 2410-2413 (March 29, 2002). (See also the cover of this issue.)

29. M. D. Hollingsworth, M. E. Brown, M. Dudley, H. Chung, M. L. Peterson and A. C. Hillier, "Template Effects, Asymmetry and Twinning in Helical Inclusion Compounds," *Angew. Chem. Int. Ed. Engl.*, **41**, 965-969 (2002).

28. M. D. Hollingsworth, M. L. Peterson, K. L. Pate, B. Dinkelmeyer and M. E. Brown, "Unanticipated Guest Motion During a Phase Transition in a Ferroelastic Inclusion Compound," *J. Am. Chem. Soc.* **124**, 2094-2095 (2002).

27. M. D. Hollingsworth, U.Werner-Zwanziger, M. E. Brown, J. D. Chaney, J. C. Huffman, K. D. M. Harris and S. P. Smart, "Spring-loading at the Molecular Level: Relaxation of Guest-Induced Strain in Channel Inclusion Compounds," *J. Am. Chem. Soc.*, **121**, 9732-9733 (1999).

26. U. Werner-Zwanziger, M. E. Brown, J. D. Chaney, E. J. Still, M. D. Hollingsworth, "Deuterium NMR Studies of Guest Motions in Urea Inclusion Compounds of 1,6-Dibromohexane with Analytical Evaluation of Spectra in the Fast Motion Limit," *Appl. Magn. Reson.*, 17(2-3), 265-281 (1999).

25. P. Girard, A. E. Aliev, F. Guillaume, K. D. M. Harris, M. D. Hollingsworth, A.-J. Dianoux, P. Jonsen, "Dynamic Properties of Dioctanoyl Peroxide Guest Molecules within the Urea Tunnel Structure: Incoherent Quasielastic Neutron Scattering and Solid State ^{2}H NMR Investigations," *J. Chem. Phys.*, **109**, 4078-4089 (1998).

24. P. Girard, A. E. Aliev, F. Guillaume, K. D. M. Harris, M. D. Hollingsworth, A.-J. Dianoux, P. Jonsen, "Reorientational Motions of Dioctanoyl Peroxide Guest Molecules within the Urea Tunnel Structure: Assessment of Two-site Jump Models," *Physica B* (Amsterdam), **234-236**, 112-114 (1997).

23. J. D. Chaney, C. R. Goss, K. Folting, B. D. Santarsiero and M. D. Hollingsworth, "Formyl C-H¨¨O Hydrogen Bonding in Crystalline Bis-Formamides?" *J. Am. Chem. Soc.*, **118**, 9432-3 (1996).

22. M. D. Hollingsworth, M. E. Brown, A. C. Hillier, B. D. Santarsiero and J. D. Chaney, "Superstructure Control in the Crystal Growth and Ordering of Urea Inclusion Compounds," *Science*, **273**, 1355-1359 (1996). (Research Article)

21. M. E. Brown, J. D. Chaney, B. D. Santarsiero, M. D. Hollingsworth, "Superstructure Topologies and Host-Guest Interactions in Commensurate Inclusion Compounds of Urea with Bis(methylketone)s," *Chem. Mater.*, **8**, 1588-1591 (1996).

20. H. Chung, M. Dudley, M. E. Brown and M. D. Hollingsworth, "Synchrotron White Beam X-ray Topography Characterization of Defect Structures in 2,10-Undecanedione/Urea Inclusion Compounds," *Mol. Cryst. Liq. Cryst.*, **276**, 203-212 (1996).

19. M. D. Hollingsworth and K. D. M. Harris, "Urea, Thiourea and Selenourea," *Comprehensive Supramolecular Chemistry* (Vol. 6; Solid State Supramolecular Chemistry: Crystal Engineering), Atwood, J. L., Davies, J. E. D., MacNicol, D. D. and Vogtle, F., eds., pp. 177-237 (1996).

18. M. E. Brown and M. D. Hollingsworth, "Stress-induced Domain Reorientation in Urea Inclusion Compounds," *Nature (London)*, **376**, 323-327 (1995). (See also the cover of this issue.)

17. M. D. Hollingsworth, M. E. Brown, B. D. Santarsiero, J. C. Huffman and C. R. Goss, "Template Directed Synthesis of 1:1 Layered Complexes of α,ω-Dinitriles and Urea: Packing Efficiency versus Specific Functional Group Interactions," *Chem. Mater.*, **6**, 1227-1244 (1994).

16. M. D. Hollingsworth, B. D. Santarsiero and K. D. M. Harris, "Zig-Zag Channels in the Structure of Sebaconitrile/Urea," *Angew. Chem. Int'l Ed. Engl.*, **33**, 649-652 (1994).

15. M. D. Hollingsworth and A. R. Palmer, "Toward a Scale of Functional Group Interaction Energies. Equilibrium Control of Functional Group Recognition in Channel Inclusion Compounds of Perhydrotriphenylene," *J. Am. Chem. Soc.*, **115**, 5881-5882 (1993).

14. M. D. Hollingsworth and C. R. Goss, "Dipole Organization in a Commensurate Phase of 5-Undecanone/urea: An X-ray Diffraction Study," *Mol. Cryst. Liq. Cryst.*, **219**,43-62 (1992).

13. K. D. M. Harris, S. P. Smart and M. D. Hollingsworth, "Structural Properties of α,ω-Dibromoalkane/Urea Inclusion Compounds: A New Type of Interchannel Guest Molecule Ordering," *J. Chem. Soc., Faraday Transactions*, **87**, 3423-3429 (1991).

12. M. D. Hollingsworth, B. D. Santarsiero, H. Oumar-Mahamat and C. J. Nichols, "New Series of 1:1 Layered Complexes of α,ω-Dinitriles and Urea, "*Chem. Mater.*, **3**, 23-25 (1991).

11. K. D. M. Harris and M. D. Hollingsworth, "Structural Properties of the Guest Species in Diacyl Peroxide/Urea Inclusion Compounds: An X-ray Diffraction Investigation," *Proc. Roy. Soc. London A,* **431**, 245-269 (1990).

10. M. D. Hollingsworth and N. Cyr, "Solid-State NMR Studies of Functional Group Recognition in Channel Inclusion Compound Formation," *Mol. Cryst. Liq. Cryst.,* **187**, 135-144 (1990).

9. M. D. Hollingsworth and N. Cyr, "High Resolution Solid-State NMR Spectra of Leucine: A Re-examination, "*J. Chem. Soc. Chem. Commun.*, 578-80, 1990.

8. M. D. Hollingsworth and J. M. McBride, "Photochemical Mechanism in Single Crystals: FTIR Studies of Diacyl Peroxides," *Advances in Photochemistry*, Vol. 15, D. Volman, G. Hammond, K. Gollnick, Eds., John Wiley and Sons, Inc. (1990), pp. 279-379.

7. M. D. Hollingsworth and J. M. McBride, "Infrared Studies of Long-Range Stress in Solid-State Peroxide Photoreactions," *Mol. Cryst. Liq. Cryst. Inc. Nonlin. Opt.*, **161**, 25-41 (1988).

6. M. D. Hollingsworth, K. D. M. Harris, W. Jones and J. M. Thomas, "ESR and X-ray Diffraction Studies of Diacyl Peroxides in Urea and Aluminosilicate Hosts," *J. Inclus. Phenom.*, **5**, 273-277 (1987).

5. M. D. Hollingsworth and J. M. McBride, "Coupling of CO_2 Asymmetric Stretching in Dimers Photogenerated Within Long-Chain Diacyl Peroxide Single Crystals," *Chem. Phys. Lett.*, **130**, 259-264 (1986).

4. J. M. McBride, B. E. Segmuller, M. D. Hollingsworth, D. E. Mills and B. A. Weber, "Mechanical Stress and Reactivity in Organic Solids," *Science*, **234**, 830-835 (1986) (Research Article)

3. M. D. Hollingsworth, "Infrared Studies of CO_2 Dimers as a Probe of Stress in Solid State Peroxide Reactions," Ph. D. Dissertation, Yale University, Nov. 1985, 1106 pp.

2. M. D. Hollingsworth and J. M. McBride, "Specific Long-Range Effects on Relaxation of Local Stress during a Solid-State Reaction," *J. Am. Chem. Soc.*, **107**, 1792-1793 (1985).

1. N. S. Mills, J. Shapiro and M. D. Hollingsworth, "Dianions of 2-Methyl-2-butene: Evidence for the Stability of a "Y-Aromatic" Species, *J. Am. Chem. Soc.*, **103**, 1263-1264 (1981).

PUBLICATIONS IN PREPARATION:

M. D. Hollingsworth, J. R. Rush, M. L. Peterson, M. Dudley, B. Raghothamachar, "X-ray Diffraction Investigations on Interfacial Effects in Ferroelastic Inclusion Compounds Exhibiting Rubber-like Behavior," in preparation for *Nature Materials*.

M. D. Hollingsworth, M. E. Brown, M. L. Peterson, J. R. Rush, E. J. Still, K. L. Pate, J. A. Desper, "Ferroelastic and Ferroelectric Domain Switching in Organic Inclusion Compounds," in preparation for *Science*.

M. D. Hollingsworth, "Crystal Growth and Domain Switching in Organic Inclusion Compounds," invited article in preparation for *Accts. Chem. Res.*

M. D. Hollingsworth, U. Werner-Zwanziger, K. L. Pate, M. L. Peterson, M. E. Brown, B. D. Dinkelmeyer, J. C. Huffman, B. L. Champion, J. R. Rush, "Substituent Effects on Phase Transitions and Domain Switching in Urea Inclusion Compounds Adopting a Non-helical Host Topology," in preparation as a full paper for *Chemistry of Materials*.

M. D. Hollingsworth, M. E. Brown, F. Guillaume, J. R. Rush, J. Bacsa, "Template Effects and Static and Dynamic Surface Roughening in the Crystal Growth of Channel Inclusion Compounds," in preparation as a full paper for *J. Am. Chem. Soc.*

M. L. Peterson, J. R. Rush, J. A. Desper, S. Zakjevski, M. D. Hollingsworth, "Oriented Aromatic Dyes in Thiourea," in preparation as a full paper for *Crystal Growth and Design*.

M. L. Peterson, J. R. Rush, M. D. Hollingsworth, "A Crystal Engineering Train Wreck: Anomalous Crystal Packing in 1,7-Dichloro-4-heptanone/urea," in preparation for *Crystal Growth and Design*.

U. Werner-Zwanziger, M. E. Brown, M. D. Hollingsworth, "End for End Exchange versus Reptation in Channel Inclusion Compounds of Perhydrotriphenylene," in preparation for *Adv. Mater*.

M. D. Hollingsworth, M. E. Brown, M. L. Peterson, "Helical Wheels: Predictive Tools for Designing Channel Inclusion Compounds of Urea," in prep. as a full paper for *J. Am. Chem. Soc.*

OTHER PUBLICATIONS

M. D. Hollingsworth, "Inclusion Compounds," *Current Opinion in Solid State and Materials Science*, **1**, 514-521 (1996) - invited review concerning the state of the field

M. E. Brown, M. D. Hollingsworth and B. D. Santarsiero, "Small Molecule Diffraction Studies with the R-Axis Area Detector - Structural Aspects of a Class of Urea Inclusion Compounds, *The Rigaku Journal*, **11**, 4-8 (1994).

M. D. Hollingsworth and M. D. Ward, "Margaret Cairns (Peggy) Etter 1943-1992," *Chem. Mater.*, **6**, 1087-1089 (1994).

M. D. Ward and M. D. Hollingsworth, "Preface to the Special Issue," *Chem. Mater.*, **6**, 1093 (1994).

M. D. Hollingsworth, "Triphosgene Warning," Chemical and Engineering News, July 13, 1992, p. 4 - letter to the editor.

K. D. M. Harris and M. D. Hollingsworth, "Losing Symmetry by Design," *Nature*, **341**, 19 (Sept. 7, 1989) - invited News and Views article.

CONTRIBUTIONS TO CONFERENCES AND SYMPOSIA (INCLUDES FORTHCOMING EVENTS)

72. Contributed Lecture: M. D. Hollingsworth, M. L. Peterson, D. S. Kesselring, A. G. Butenhoff, D. A. Higgins, G. Springer, F. Guillaume, "A New Family of Ferroelastic and Ferroelectric Calixarenes," Nineteenth Midwest Organic Solid State Chemistry Symposium, Manhattan, KS, June 2008.

71. Invited Lecture/Panel Discussion: M. D. Hollingsworth, "Design and Control of Structure and Function of Molecular Crystals and Solid-State Supramolecular Assemblies," Chemistry for the 21st Century, Yale Alumni Chemistry Reunion, Yale University, Nov. 2-4, 2007.

70. Invited Lecture: M. D. Hollingsworth, M. L. Peterson, J. R. Rush, M. J. Abel, A. A. Black, " Memory and Perfection in Ferroelastic Inclusion Compounds," 42nd Congress of the Mexican Chemical Society, Guadalahara, Mexico, Sept. 2007.

69. Plenary Lecture: M. D. Hollingsworth, J. R. Rush, J. Bacsa, F. Guillaume, A. Desmedt, M. J. Abel, and A. A. Black, "Supramolecular Stereochemistry and Crystal Growth in Channel Inclusion Compounds," 18th International Conference on the Chemistry of the Organic Solid State, Merida, Venezuela, July 8-13, 2007. I also gave a lecture entitled, "Venezuela Birds - A Great National Heritage" as the last talk of the conference.

68. Invited Lecture: M. D. Hollingsworth, "Molecular Recognition in Channel Inclusion Compounds - Or Not!" School on Materials Applications of the Organic Solid State, Merida, Venezuela, July 2-7, 2007.

68. Invited Lecture: M. D. Hollingsworth, "Ferroelastic and Ferroelectric Materials - Properties and Design," School on Materials Applications of the Organic Solid State, Merida, Venezuela, July 2-7, 2007.

68. Invited Lecture: M. D. Hollingsworth, "The Role of Local and Long-range Stress in Solid State Photoreactions," School on Materials Applications of the Organic Solid State, Merida, Venezuela, July 2-7, 2007.

67. Invited Lecture: M. D. Hollingsworth, J. R. Rush, J. Bacsa, F. Guillaume, A. Desmedt, M. J. Abel, and A. A. Black," Supramolecular Stereochemistry and Crystal Growth in Channel Inclusion Compounds," XIth International Seminar on Inclusion Compounds (ISIC–11), Kyiv, Ukraine, June 10 - 15, 2007.

66. Contributed Lecture: M. D. Hollingsworth, J. R. Rush, M. L. Peterson, M. J. Abel, A. A. Black, D. S. Kesselring, A. G. Butenhoff, M. Dudley, B. Raghothamachar, "Memory and Perfection in Domain Switching Processes," 11th International Meeting on Ferroelectricity, Iguassu Falls, Brazil, Sept. 5-9, 2005.

65. Invited Lecture: M. D. Hollingsworth, "Memory and Perfection in Domain Switching Processes," Summer School on Stereochemical Aspects of Novel Materials, International Center for Materials Research, UCSB, Santa Barbara, CA., August 14-26, 2005.

64. Invited Lecture: M. D. Hollingsworth, "Supramolecular Stereochemistry and Crystal Growth in Channel Inclusion Compounds," Summer School on Stereochemical Aspects of Novel Materials, International Center for Materials Research, UCSB, Santa Barbara, CA., August 14-26, 2005.

63. Contributed Lecture: M. D. Hollingsworth, J. R. Rush, M. L. Peterson, M. J. Abel, A. A. Black, D. S. Kesselring, A. G. Butenhoff, "Memory and Perfection in Domain Switching Processes," 17th International Conference on the Chemistry of the Organic Solid State, UCLA, Los Angeles, CA, July 24-29, 2005.

62. Invited Lecture: M. D. Hollingsworth, J. R. Rush, J. Bacsa, F. Guillaume, A. Desmedt, M. J. Abel, and A. A. Black, "Static versus Dynamic Surface Roughening in the Crystal Growth of Channel Inclusion Compounds," 2005 American Conference on Crystal Growth and Epitaxy, Big Sky, MT, July 2005

61. Invited Lecture: M. D. Hollingsworth, J. R. Rush, M. L. Peterson, M. J. Abel, A. A. Black, D. A. Kesselring, A. G. Butenhoff, "Crystal Engineering, Crystal Growth and Memory Effects in

Ferroelastics and Ferroelectrics," Workshop on Designing Non-Traditional Materials Based on Geometrical Principles Hanover, Germany, June 20-22, 2005.

60. Invited Lecture: M. D. Hollingsworth, J. R. Rush, M. L. Peterson, M. Dudley, B. Ragothamachar, M, J. Abel, A. A. Black, "Memory, Perfection and Rubber-like Behavior in Ferroelastic and Ferroelectric Inclusion Compounds," American Crystallographic Association National Meeting, Orlando, FL, May 2005.

59. Contributed Lecture: M. D. Hollingsworth, M. L. Peterson, J. R. Rush, M. J. Abel, A. A. Black, D. A. Kesselring, A. G. Butenhoff, K. L. Pate, and J. A. Cooper, "From Ferroelastics to Ferroelectrics," Midwest Regional ACS Meeting, Manhattan, KS Oct. 2004.

58. Invited Lecture: M. D. Hollingsworth, M. L. Peterson, J. R. Rush, M. J. Abel, A. A. Black, D. A. Kesselring and A. G. Butenhoff, "From Ferroelastics to Ferroelectrics," 39th Congress of the Mexican Chemical Society, Merida, Mexico, Oct. 2004.

57. Contributed Lecture: M. D. Hollingsworth, J. Bacsa, C. F. Campana and M. L. Peterson, "Translational Disorder and Crystal Growth Mechanisms in Channel Inclusion Compounds," American Crystallographic Association National Meeting, Chicago, IL, July 2004

56. Plenary Lecture: M. D. Hollingsworth, J. R. Rush, M. L. Peterson, B. L Champion, M. J. Abel, and A. A. Black, "Symmetry Reduction in Ferroelastics: A General Approach to New Ferroelectric Materials?" Sixteenth International Conference on the Chemistry of the Organic Solid State, Sydney, Australia, July 13-18, 2003.

55. Poster: M. D. Hollingsworth, J. R. Rush, J. Bacsa, F. Guillaume, A. Desmedt, E. Elisabeth, M. J. Abel, and A. A. Black, "Static versus Dynamic Surface Roughening in the Crystal Growth of Channel Inclusion Compounds," Sixteenth International Conference on the Chemistry of the Organic Solid State, Sydney, Australia, July 13-18, 2003.

54. Invited Lecture: M. D. Hollingsworth, M. L. Peterson, M. J. Abel, A. A. Black, D. A. Higgins, G. Springer, J. C. Desper, J. Bacsa, M. Dudley, B. Ragothamachar, "Ferroelastic and Ferroelectric Domain Switching in Organic Inclusion Compounds," XIIth International Symposium on Supramolecular Chemistry, Oct. 6-11, 2002, Eilat, Israel.

53. Contributed Lecture: Hollingsworth, M. D., Peterson, M. L., Bacsa, J., Dudley, M., and Ragothamachar, B., "Twinning, Epitaxy, and Domain Switching in Ferroelastic Inclusion Compounds," NASA Microgravity Materials Science Conference, Huntsville, AL, June 25-27, 2002.

52. Invited Lecture: Hollingsworth, M. D., Peterson, M. L., Bacsa, J., Champion, B. L., Cooper, J. A. "New Tools for Studying Ferroelastic and Ferroelectric Domain Switching," American Conference on Crystal Growth/West, Lake Tahoe, CA, June 2002.

51. Invited Lecture: Hollingsworth, M. D., Peterson, M. L., Bacsa, J., Champion, B. L., "New Tools for Studying Ferroelastic and Ferroelectric Domain Switching," American Crystallographic Association National Meeting, San Antonio, TX, May 2002.

50. Contributed Lecture: Hollingsworth, M. D., Peterson, M. L., Kesselring, D. S., Butenhoff, A. G., Higgins, D. A., Springer, G., "A New Family of Ferroelastic and Ferroelectric Calixarenes," Fifteenth International Conference on the Chemistry of the Organic Solid State, Mainz, Germany, July 29 - August 3, 2001.

49. Poster: Pate, K. L., Peterson, M. L., Dinkelmeyer, B. D., Brown, M. E., Hollingsworth, M. D. "Failure of the topochemical postulate during a phase transition in a ferroelastic inclusion compound," poster presented at the Fifteenth International Conference on the Chemistry of the Organic Solid State, Mainz, Germany, July 29 - August 3, 2001.

48. Poster: Peterson, M. L., Hollingsworth, M. D., Dudley, M. and Ragothamachar, B. "Synchrotron white beam X-ray topography of domain switching in ferroelastic inclusion compounds," poster presented at the Fifteenth International Conference on the Chemistry of the Organic Solid State, Mainz, Germany, July 29 - August 3, 2001.

47. Invited Lecture: Hollingsworth, M. D.; Peterson, M. L., Geiger, T. A., Pate, K. L., Kesselring, D. S. and Butenhoff, A. G. "Ferroelastic and Ferroelectric Domain Switching in Organic Inclusion Compounds." Southwest-Southeast Regional ACS meeting, New Orleans, LA, Dec. 6-8, 2000.

46. Invited Lecture: Hollingsworth, M. D., Peterson. M. L., Dinkelmeyer, B., Kesselring, D. S., Butenhoff, A. G., "Ferroelastic and Ferroelectric Domain Switching in Organic Inclusion Compounds," Dynamics and Transformations of Molecular Materials (Eighth Polish-French Chemistry Seminar), Czocha Castle, Poland, Sept. 13-17, 2000.

45. Poster: Hollingsworth, M. D., Peterson, M. L., Dudley, M., Ragothamachar, B. "Synchrotron White Beam X-ray Topography Studies of Cooperativity and Impurity Control in Ferroelastic Domain Switching Processes." Dynamics and Transformations of Molecular Materials (Eighth Polish-French Chemistry Seminar), Czocha Castle, Poland, Sept. 13-17, 2000.

44. Invited Lecture: Hollingsworth, M. D., "Ferroelastic and Ferroelectric Domain Switching in Organic Inclusion Compounds," Gordon Conference on "Organic Structures and Properties: Extended Systems," Connecticut College, June 17-22, 2000.

43. Poster: Peterson, M. L., Hollingsworth, M. D., Brown, M. E., Dudley, M., Raghothamachar, B., "Tailor-made Impurity Control of Elastic Versus Plastic Domain Switching in Ferroelastic Inclusion Compounds," Gordon Conference on "Organic Structures and Properties: Extended Systems," Connecticut College, June 17-22, 2000.

42. Poster: Hollingsworth, M. D., Brown, M. E., Peterson, M. L., Dudley, M., Raghothamachar, B., "Tailor-made Impurity Control of Elastic Versus Plastic Domain Switching in Ferroelastic Inclusion Compounds," NASA Microgravity Materials Science Conference, Huntsville, AL June 5-8, 2000.

41. Poster: Hollingsworth, M. D., Brown, M. E., Dudley, M., Chung, H., "Synchrotron White Beam X-ray Topography of Domain Switching and Twinning in Organic Inclusion Compounds," Minisymposium on Physical and Biophysical Chemistry, Kansas State University, Manhattan, KS, Oct. 30, 1999.

40. Poster: Hollingsworth, M. D.; Brown, M. E.; Werner-Zwanziger, U.; Chaney, J. D. "Spring-loaded Phase Transitions in Urea Inclusion Compounds," Fourteenth International Conference on the Chemistry of the Organic Solid State, Cambridge, U.K., July 25-30, 1999.

39. Contributed Lecture: Hollingsworth, M. D., Kesselring, D., Dinkelmeyer, B., Brown, M. E., "Crystal Growth, Domain Switching and the Search for Ferroelectric Behavior in Calixarene Solid Solutions," Fourteenth International Conference on the Chemistry of the Organic Solid State, Cambridge, U.K., July 25-30, 1999.

38. Invited Lecture: Hollingsworth, M. D., U. Werner-Zwanziger, J. D. Chaney, and M. E. Brown, "Domain Switching and Phase Transitions as Models for Solid State Reactions," US-Japan workshop on Solid State Chemistry, Lake Arrowhead, CA, Dec. 6-10, 1998.

37. Invited Lecture: Hollingsworth, M. D., J. D. Chaney, M. E. Brown, U. Werner-Zwanziger, "Domain and Phase Growth in Organic Inclusion Compounds," American Crystallographic Society, Annual Meeting, symposium on "Crystal Growth: Techniques and Mechanisms," July 24-28, 1998.

36. Invited Lecture: Hollingsworth, M. D. and co-workers, "Domain Switching as a Model for Solid State Reactions," 27th Reactions Mechanisms Conference, Asilomar Conference Center, Carmel, CA, June 28-July 3, 1998.

35. Plenary Lecture: Hollingsworth, M. D. "Cooperative Processes and Domain Switching in Organic Inclusion Compounds," Organic Crystal Chemistry Symposium (OCC97), Rydzyna, Poland, 17-21 August 1997.

34. Plenary Lecture: Hollingsworth, M. D., "Crystal Growth and Domain Switching in Organic Inclusion Compounds," Thirteenth International Conference on the Chemistry of the Organic Solid State, Stony Brook, NY, July 13-18, 1997.

33. Poster: U. Werner-Zwanziger, J.D. Chaney, M.E. Brown, E.J. Still, and M.D. Hollingsworth, ^{2}H NMR Studies of Guest-Induced Strain in Commensurate Inclusion Compounds of Urea," Thirteenth International Conference on the Chemistry of the Organic Solid State, Stony Brook, NY, July 13-18, 1997.

32. Poster: J. D. Chaney, H. Chung, M. E. Brown, M. D. Hollingsworth, and M. Dudley, "Synchrotron White Beam X-ray Topography and X-ray Crystallographic Studies of Domains and Domain Switching in Channel Inclusion Compounds," Thirteenth International Conference on the Chemistry of the Organic Solid State, Stony Brook, NY, July 13-18, 1997.

31. Invited lecture: M. D. Hollingsworth and co-workers, "Design and Growth of Ferroelastic Inclusion Crystals" Gordon Conference on Physical Organic Chemistry, Holderness School, New Hampshire, June 1997.

30. Invited lecture: M. D. Hollingsworth and co-workers, "Ferroelastic Domain Switching as a Model for Solid State Reactivity," symposium on "Modification of Chemical Behavior by Use of Supramolecular Assemblies" at the 1997 Canadian Society for Chemistry National Meeting, Windsor, ON, June 1-5, 1997

29. Invited lecture: M. D. Hollingsworth, Michael E. Brown, Jason D. Chaney, Ulrike Werner-Zwanziger and Elizabeth A. Crane, "Topology, Architecture and Tailor-made Impurities in Ferroelastic Inclusion Compounds, symposium on "Molecular Design for Self-Assembled Structures: Principles and Applications," at the Central Regional ACS Meeting, Midland, MI, May 28-30, 1997.

28. Invited lecture: M. D. Hollingsworth, "Superstructure Control of Shape and Ferroelasticity of Urea Inclusion Compounds," 4th NSF-Sponsored Materials Chemistry Workshop, Philadelphia, PA, Oct. 17-20, 1996.

27. Invited lecture: M. D. Hollingsworth, M. E. Brown, U. Werner-Zwanziger, J. D. Chaney, E. A. Crane and E. J. Still, "Superstructure Control of Crystal Growth and Ferroelasticity in Urea

Inclusion Compounds," Ninth International Symposium on Molecular Recognition and Inclusion, Lyon, France, Sept. 7-12, 1996

26. Poster: M. D. Hollingsworth, M. E. Brown, J. D. Chaney, U. Werner-Zwanziger, E. J. Still, J. A. Vanecko, "Cooperative Mechanisms in Ferroelastic Inclusion Compounds," 26th Reaction Mechanisms Conference, Stony Brook, NY, June 7-12, 1996.

25. Invited lecture: M. D. Hollingsworth, M. E. Brown, J. D. Chaney, U. Werner-Zwanziger, E. J. Still, J. A. Vanecko, "Superstructure Control of Shape and Elasticity of Urea Inclusion Compounds," NATO Advanced Research Workshop, Self-Assembly in Synthetic Chemistry, Val Morin, Quebec, May 16-21, 1996.

24. Invited lecture: M. D. Hollingsworth, U. Werner-Zwanziger and M. E. Brown, "Spectroscopic and Structural Studies of Functional Group Pairs in Channel Inclusion Compounds," International Congress of Pacific Basin Societies (PACIFICHEM '95), Honolulu, HI, Dec. 17-22, 1995 (Symposium on Role of Spectroscopic Methods in Modern Inorganic Chemistry).

23: Invited short talk: M. D. Hollingsworth, "Crystal Growth and Ferroelasticity in Organic Inclusion Compounds," NATO Advanced Research Workshop, Crystals: Supramolecular Materials," Sestri Levante, Italy, August 1995.

22. Poster: M. E. Brown and M. D. Hollingsworth, "The Role of Superstructures in the Crystal Growth and Ordering of Urea Inclusion Compounds," NATO Advanced Research Workshop, Crystals: Supramolecular Materials," Sestri Levante, Italy, August 1995.

21. Contributed lecture: M. D. Hollingsworth, M. E. Brown and A. D. Hillier, "The Role of Superstructures in the Crystal Growth and Ordering of Supramolecular Assemblies," Third International Workshop on Crystal Growth of Organic Materials, Washington, D. C. August 1995.

20. Poster: M. D. Hollingsworth and M. E. Brown, "The Role of Superstructures in the Crystal Growth and Ordering of Supramolecular Assemblies," 8th International Symposium on Molecular Recognition and Inclusion, Carleton University, Ottawa, Ontario, August 1994.

19. Poster: M. D. Hollingsworth, M. E. Brown, A. E. Aliev and K. D. M. Harris, "Crystallographic and Magnetic Resonance Anomalies in n-Alkanone/Urea Inclusion Compounds," Eleventh International Conference on the Chemistry of the Organic Solid State, Jerusalem, Israel, July 1993.

18. Poster: M. D. Hollingsworth, C. R. Goss and K. Folting, "Crystal Packing and Interactions in Primary N-Alkyl Formamides," Eleventh International Conference on the Chemistry of the Organic Solid State, Jerusalem, Israel, July 1993.

17. Plenary Lecture: Hollingsworth, M. D., Brown, M. E., John C. Huffman and O. H. Han, "Functional Group Recognition in Channel Inclusion Compounds," Eleventh International Conference on the Chemistry of the Organic Solid State, Jerusalem, Israel, July 1993.

16. Invited Lecture: Hollingsworth, M. D., "Functional Group Recognition in Channel Inclusion Compounds," Gordon Conference on Physical Organic Chemistry, June 1993, The Holderness School, NH.

15. Invited Lecture: Hollingsworth, M. D., Twelfth NSF Workshop on Reactive Intermediates, June 1993, Lake Tahoe, CA.

14. Contributed lecture: Hollingsworth, M. D., J. C. Huffman, S. P. Smart and K. D. M. Harris, "Functional Group Recognition and Non-recognition in Channel Inclusion Compounds," American Crystallographic Association National Meeting, Pittsburgh, PA, August 1992

13. Contributed Lecture: Hollingsworth, M. D., B. D. Santarsiero, J. C. Huffman, C. R. Goss, K. Folting, H.O. Mahamat and L. Di, "Packing Efficiency and Interactions in Channels and Layers," 4th Midwest Organic Solid State Chemistry Symposium, Lincoln, Nebraska, June 1992.

12. Poster: Hollingsworth, M. D., Goss, C. R, Harris, K. D. M., Santarsiero, B. D., "Long Range Dipole Organization and Crystal Habits of n-Alkanone/Urea Inclusion Compounds," Tenth International Conference on the Chemistry of the Organic Solid State, Vancouver, B.C., July 1991.

11. Poster: Hollingsworth, M. D., K. D. M. Harris, C. R. Goss, C. M. Bigam and A. R. Palmer, "Toward a Scale of Functional Group Interaction Energies: Equilibrium Control of Guest Orientations in Channel Inclusion Compounds of Perhydrotriphenylene," Sixth International Symposium on Molecular Recognition and Inclusion, Berlin, Federal Republic of Germany, Sept. 10-14, 1990.

10. Poster: M. D. Hollingsworth, N. Cyr, J. Huang, S. B. Rusch and C. J. Nichols, "Functional Group Recognition in Channel Inclusion Complex Formation," Ninth International Conference on the Chemistry of the Organic Solid State, Como, Italy, July 2-7, 1989.

9. Invited keynote lecture: M. D. Hollingsworth, "Cooperativity and Molecular Recognition in Crystals," Second Annual Midwest Organic Solid State Chemistry Symposium, Minneapolis, MN, June 10-11, 1989.

8. Invited Lecture: M. D. Hollingsworth, J. Huang, K.D.M. Harris and N. Cyr, "Studying Substituent Effects in Channels," 72nd Canadian Chemical Conference and Exhibition, Victoria, B.C., June 4-8, 1989.

7. Awards Address: M. D. Hollingsworth, "Infrared Studies of CO_2 Dimers as a Probe of Local Stress in Solid State Peroxide Reactions," for receipt of the Distinguished Dissertation Award (Physical Sciences and Engineering, 1982-1986), Annual Meeting of the Northeastern Association of Graduate Schools, State College, PA, April 1988.

6. Plenary Lecture: M. D. Hollingsworth, "Radical Reactions in Crystalline Hosts," Eighth International Congress on the Chemistry of the Organic Solid State, Lyon-Villeurbanne, France, July 1987.

5. Awards address: Hollingsworth, M. D. and J. M. McBride, "Local Stress and Mechanism in Solid State Photochemistry," for receipt of the 1987 Nobel Laureate Signature Award for Graduate Education in Chemistry, 193rd ACS National Meeting, Denver, Colo., April 1987

4. Poster: Hollingsworth, M. D. and J. M. McBride, "Infrared Studies of Long-Range Stress in Solid-State Peroxide Photoreactions, The Eighth International Congress on the Chemistry of the Organic Solid State, Lyon-Villeurbanne, France, July 1987.

3. Poster: Hollingsworth, M. D. and J. M. McBride, "Infrared Studies of Photoreactions within Crystalline Acetyl Benzoyl Peroxide, The Eighth International Congress on the Chemistry of the Organic Solid State, Lyon-Villeurbanne, France, July 1987.

2. Poster: Harris, K. D. M., M. D. Hollingsworth, W. Jones and J. M. Thomas, "Structure and Reactivity of Diacyl Peroxide/Urea Inclusion Complexes, The Eighth International Congress on the Chemistry of the Organic Solid State, Lyon-Villeurbanne, France, July 1987.

1. Poster: Harris, K. D. M., M. D. Hollingsworth, W. Jones, J. M. Thomas and W.-N. Wang, "A Comparison of Photoreactivity of Diacyl Peroxides in Urea and Aluminosilicate Hosts," 4th International Symposium on Inclusion Phenomena, Lancaster, U. K. July 1986.

CONTRIBUTIONS TO CONFERENCES BY STUDENTS AND COLLABORATORS

29. Poster: B. Toudic, P. Rabiller, C. Odin, L. Bourgeois, C. Ecolivet, P. Garcia, F. Le Gac, P. Bourges, F. Guillaume, T. Brewczewski, M.D. Hollingsworth, "New Crystallographic Features in Aperiodic Supramolecular Crystals" XX Congress of the International Union of Crystallography, Florence, Italy, August 23-31, 2005.

28. Contributed Talk: J. R. Rush, M. D. Hollingsworth and M. J. Abel, "Polar Ordering and Electric Field-Induced Domain Reorientation in Ferroelastic Channel Inclusion Compounds," Midwest Regional ACS Meeting, Manhattan, KS Oct. 2004.

27. Contributed Talk: J. R. Rush, M. D. Hollingsworth and M. J. Abel, "Polar Ordering and Electric Field-Induced Domain Reorientation in Ferroelastic Channel Inclusion Compounds," American Crystallographic Association National Meeting, Chicago, IL, July 2004.

26. Contributed Talk: J. R. Rush, M. D. Hollingsworth and M. J. Abel, "Polar Ordering and Electric Field-Induced Domain Reorientation in Channel Inclusion Compounds," Fifteenth Midwest Organic Solid State Chemistry Symposium, Carbondale, IL June 2004.

25. Contributed Talk: J. R. Rush, M. J. Abel, A. A. Black and M. D. Hollingsworth, "Symmetry Reduction and Ordering in Urea Inclusion Compounds," Fourteenth Midwest Organic Solid State Chemistry Symposium, Minneapolis, MN, June 2003.

24. Contributed Talk: Abel, M. J., Black, A. A., Hollingsworth, M. D., "Factors Affecting Domain Reorientation in Ferroelastic Inclusion Compounds," Fourteenth Midwest Organic Solid State Chemistry Symposium, Minneapolis, MN, June 2003.

23. Contributed Talk: Pate, K. L., Hollingsworth, M. D., Peterson, M. L., Dinkelmeyer, B. D., Brown, M. E. "Nontopochemical motion during a phase transition in a ferroelastic inclusion compound," Twelfth Midwest Organic Solid State Chemistry Symposium, Lincoln, NE, June 2001.

22. Contributed Talk: Peterson, M. L., Hollingsworth, M. D., Brown, M. E., Butenhoff, A. G., "Ferroelectric 4-tert-Butylcalix[4]arene Inclusion Crystals," Twelfth Midwest Organic Solid State Chemistry Symposium, Lincoln, NE, June 2001.

21. Contributed Talk: Dinkelmeyer, B., Hollingsworth, M. D., Brown, M. E., "Mechanism and Control of Ferroelastic Phase Transitions in Urea Inclusion Compounds Containing α,ω-Disubstituted Hexanes," Eleventh Midwest Organic Solid State Chemistry Symposium, West Lafayette, IN, June 9-10, 2000.

20. Contributed Talk: Peterson, M. L., Hollingsworth, M. D., Brown, M. E., Dudley, M., Raghothamachar, B., Dhanaraj, G., "Tailor-made Impurity Control of Elastic Versus Plastic Domain Switching in Ferroelastic Inclusion Compounds," Eleventh Midwest Organic Solid State Chemistry Symposium, West Lafayette, IN, June 9-10, 2000.

19. Contributed talk: Michael E. Brown, Ulrike Werner-Zwanziger, Jason D. Chaney, Ezra J. Still, and Mark D. Hollingsworth, "Spring-loaded Phase Transitions in Channel Inclusion Compounds of Urea," Tenth Midwest Organic Solid State Chemistry Symposium, Indianapolis, IN, June 4-5, 1999.

18. Poster: U. Werner-Zwanziger, M. E. Brown, J. D. Chaney, E. J. Still, and M. D. Hollingsworth, "Guest Motions in Dihalohexane/Urea Inclusion Compounds studied by ^{2}H NMR," 29th AMPERE - 13th International Conference on Magnetic Resonance and Related Phenomena, Berlin, Germany, August 2-7, 1998.

17. Contributed lecture: M. E. Brown, J. D. Chaney, M. D. Hollingsworth, "Hydrogen-bonded Urea Inclusion Compounds and their Ferroelastic Phase Transitions," Ninth Midwest Organic Solid State Chemistry Symposium, Kansas State University, Manhattan, KS, June 12-13, 1998.

16. Poster: U. Werner-Zwanziger, M. E. Brown, J. D. Chaney, E. J. Still, and M. D. Hollingsworth, "Guest Motions in Dihalohexane/Urea Inclusion Compounds studied by ^{2}H NMR," 39th Experimental Nuclear Magnetic Resonance Conference, Pacific Grove, CA March 22-27, 1998.

15. Poster: U. Werner-Zwanziger, M. E. Brown, J. D. Chaney, E. J. Still, and M. D. Hollingsworth, "^{2}H NMR Studies of Dihalohexane/Urea Inclusion Compounds," Gordon Research Conference on Magnetic Resonance, Henniker, NH, June 22-27, 1997.

14. Poster: U. Werner-Zwanziger, M. E. Brown, J. D. Chaney, E. J. Still, and M. D. Hollingsworth, ^{2}H NMR Studies of Commensurate Dihalohexane/Urea Inclusion Compounds," 38th Experimental Nuclear Magnetic Resonance Conference, Orlando, Florida, March 23-27, 1997.

13. Contributed lecture: U. Werner-Zwanziger, M. E. Brown, J. D. Chaney, E. J. Still, J. A. Vanecko and M. D. Hollingsworth, "Deuterium NMR Studies of Commensurate Urea Inclusion Compounds," Chicago Area NMR Discussion Group, Nov. 2, 1996.

12. Contributed lecture: M. E. Brown, J. D. Chaney, E. J. Still, E. A. Crane, J. A. Vanecko and M. D. Hollingsworth, "Designing Urea Inclusion Compounds," Eighth Midwest Organic Solid State Chemistry Symposium, Lincoln, NE, June 1996.

11. Contributed lecture: U. Werner-Zwanziger, J. D. Chaney, E. J. Still, E. A. Crane, J. A. Vanecko and M. D. Hollingsworth, "NMR Studies of Urea Inclusion Compounds," Eighth Midwest Organic Solid State Chemistry Symposium, Lincoln, NE, June 1996.

10. Poster: H. Chung, M. Dudley, M. E. Brown and M. D. Hollingsworth, "Synchrotron White Beam X-ray Topography Characterization of Defect Structures in 2,10-Undecanedione/urea Inclusion Compounds," Twelfth International Conference on the Chemistry of the Organic Solid State, Matsuyama, Japan, July 9-14, 1995 (Chung and Dudley in attendance).

9. Contributed lecture: M. E. Brown and M. D. Hollingsworth, "Ferroelastic Inclusion Compounds," Seventh Midwest Organic Solid State Chemistry Symposium, Bloomington, IN, June, 1995

8. Contributed lecture: J. D. Chaney, M. D. Hollingsworth, K. Folting and C. R. Goss, "C-H---O Hydrogen Bonding at Work: Crystal Packing Patterns of Even-Chain bis-Formamides," Seventh Midwest Organic Solid State Chemistry Symposium, Bloomington, IN, June 1995.

7. Contributed lecture: U. Werner-Zwanziger, M. E. Brown and M. D. Hollingsworth, "Incommensurate Inclusion Compounds: Ideal Hosts for Studies of Functional Group Interactions," Seventh Midwest Organic Solid State Chemistry Symposium, Bloomington, IN, June 1995.

6. Paper: U. Werner-Zwanziger, M. E. Brown and M. D. Hollingsworth, "NMR Studies of Functional Group Interactions in Incommensurate Channel Inclusion Compounds," 1994 Chicago Area NMR Discussion Group, Nov. 12, 1994.

5. Poster: U. Werner-Zwanziger, M. E. Brown and M. D. Hollingsworth, "Incommensurate Inclusion Compounds: Ideal Systems for Studies of Functional Group Interactions," XXVII Congress Ampere, Kazan, Russian Federation, Aug. 21, 1994.

4. Poster: U. Werner-Zwanziger, M. E. Brown and M. D. Hollingsworth, "Incommensurate Inclusion Compounds: Ideal Systems for Studies of Functional Group Interactions," Gordon Research Conference of Order/Disorder in Solids, New London, New Hampshire, Aug. 7, 1994.

3. Contributed Lecture: M. E. Brown and M. D. Hollingsworth, "The Role of Superstructures in the Ordering and Crystal Growth of Supramolecular Assemblies" 6th Midwest Solid State Organic Chemistry Symposium, Minneapolis, MN, June 11, 1994.

2. Contributed Lecture: M. D. Hollingsworth, M. E. Brown, A. E. Aliev and K. D. M. Harris, "The 2-Undecanone/Urea Conundrum," Fifth Midwest Organic Solid State Chemistry Conference, Purdue University, West Lafayette, IN, June 1993.

1. Poster: Harris, K. D. M., S. P. Smart and M. D. Hollingsworth, "Interchannel Ordering of Guest Molecules in Urea Inclusion Compounds," International Union of Crystallography Congress, Bordeaux, France, July 1990.

GRANTS AND AWARDS FOR RESEARCH

Investigator, dates	Agency, Type, Grant Title	Amount
M. D. Hollingsworth 7-1-08 to 6-30-11	National Science Foundation (Division of Chemistry), "Synthesis and Mechanistic Studies of New Series of Ferroelastic and Ferroelectric Crystals"	$390,000
M. D. Hollingsworth 10-8-2003 to present	Unrestricted funds from Pharmascience, Inc., Apotex, Inc., and Ranbaxy Pharmaceuticals, Ltd.	$133,052
M. D. Hollingsworth 1-1-2006 to 8-31-2008	American Chemical Society (PRF, Type AC "Crystal Growth, Polar Ordering and Domain Switching in Ferroelastoelectric Inclusion Compounds"	$80,000
M.D. Hollingsworth 4-1-00 to 11-30-04	National Aeronautics and Space Administration (Microgravity Materials Science Initiative - Research and Flight Experiment Opportunities), "Crystal Growth of New Families of Ferroelastic Materials"	$310,000
M. D. Hollingsworth	Department of Energy (Intense Pulsed Neutron	~10 days

Jan.-June, 2003	Source, Argonne National Laboratories), " "Neutron Diffraction of Formyl C-H---O Interactions"	of beam time
M. D. Hollingsworth Jan.-June, 2000	Department of Energy (Intense Pulsed Neutron Source, Argonne National Laboratories), " "Neutron Diffraction of Ferroelectric and Ferroelastic Calixarene Crystals"	~10 days of beam time
F. Guillaume M. D. Hollingsworth B. Toudic, C. Odin August 13-18, 2001	Berlin Experimental Neutron Scattering Center, "Molecular Dynamics in the Incommensurate 2-Decanone/urea crystal	6 days of beam time
M. D. Hollingsworth, and four co-PIs 8-1-00 to 7-31-01	National Science Foundation, Division of Materials Research, "Acquisition of a Scanning Probe Microscope for Materials Research and Education,"	$100,000
M. D. Hollingsworth 4-1-97 to 3-31-01	National Science Foundation (Division of Materials Research), "Cooperative Phenomena and Domain Switching Processes in Organic Inclusion Compounds"	$243,500
M. D. Hollingsworth 6-1-95 to 5-31-00	National Science Foundation (Division of Materials Research), "Energetic and Structural Studies of Functional Group Pairs for Materials Research"	$300,000
M. D. Hollingsworth 4-23-96 to 4-22-97	Research Corporation, "Stereomicroscope for Studies of Organic Crystals and Inclusion Compounds"	$15,000 (+$7,500 match from IU)
M. D. Hollingsworth 7-1-95 to 8-31-97	American Chemical Society (Petroleum Research Fund, Type AC), "Crystal Engineering and Ordering in One, Two and Three Dimensions"	$50,000
M. D. Hollingsworth 7-1-95 to 5-31-96	National Science Foundation (Chemistry Division), "Equipment Supplement for CHE-9423726: Solid State NMR Console"	$37,450 (+$26,000 match from IU)
M. D. Hollingsworth 1993-1995	Cambridge Isotope Laboratories, "^{13}C Labeled Compounds for Spectroscopic Studies of Functional Group Interactions"	$3,000 in labeled compounds
M. D. Hollingsworth Summer, 1992	Indiana University, Summer Faculty Fellowship "Structural Studies of Functional Group Pairs in Channel Inclusion Compounds"	$4,500
M. D. Hollingsworth 9-15-91 to 9-14-93	Alfred P. Sloan Foundation - Sloan Research Fellowship	$30,000
M. D. Hollingsworth 9-1-91 to 8-31-93	Petroleum Research Fund (Type AC) "A Scale of Functional Group Interaction Energies"	$40,000

M. D. Hollingsworth 1991-1993 (terminated 9-91)	NSERC, Operating, "Functional Group Interactions in Organic Crystals and Inclusion Compounds"	CAN$24,000
M. D. Hollingsworth 1989-1991	NSERC, Operating, "Inclusion Phenomena, Molecular Recognition and Intermolecular Forces"	CAN $46,980
M. D. Hollingsworth 1990	Univ. of Alberta, Central Research Fund Operating, "Solid-state NMR Studies in Colorado and Scotland"	CAN $1,600
M. D. Hollingsworth 1989	Univ. of Alberta, Central Research Fund, Operating, "Solid-state NMR Studies"	CAN $2,000
M. D. Hollingsworth 1988	Univ. of Alberta, Central Research Fund, Operating, "Spectroscopic and Mechanistic Studies of Reactions in Organic Solids"	CAN $4,000
M. D. Hollingsworth 1986-1987	NSF-NATO Postdoctoral Fellowship for research at the University of Cambridge	$23,600

GRANTS IN SUPPORT OF CONFERENCES

M. D. Hollingsworth and J. R. Scheffer April, 1991	Petroleum Research Fund (Type SE), "Tenth International Conference on the Chemistry of the Organic Solid State	$2,000
M. D. Hollingsworth and J. R. Scheffer April, 1991	NSERC, Canada (Conference Grant) "Tenth International Conference on the Chemistry of the Organic Solid State"	CAN$2,000

In 1995, I raised $500 from Eli Lilly, Inc. for the Midwest Organic Solid State Chemistry Symposium. This year, I raised $500 from TransForm Pharmaceuticals and $500 from Ipharma for the 19th Midwest Organic Solid State Chemistry Symposium. In 1991, I also raised money from the following companies for the Tenth International Conference on the Chemistry of the Organic Solid State: Bruker Spectrospin Canada: Can$500, Chemagnetics, Inc.: $250, Doty Scientific, Inc.: $500, GTE Laboratories: $1000.

OTHER EXPERIENCE:

GROW WORKSHOPS FOR MIDDLE SCHOOL GIRLS: In the summers of 2005, 2007 and 2008, I have conducted GROW (Girls Researching Our World) workshops ("This View of Crystals") on growth of ferroelastic crystals, ferroelastic domain switching of urea inclusion compounds and crystal optics. This very successful workshop was part of a larger effort of the Women in Engineering and Science Program (WESP) at KSU to attract 11-13 year old girls to careers in science. I continue to advise the WESP coordinators on new workshop activities.

CO-CHAIR: Nineteenth Midwest Organic Solid State Chemistry Symposium, Manhattan, KS, June 13-14, 2008.

GUEST PROFESSOR: In the summer of 2005, I was a guest lecturer at a "Summer School" on "Stereochemical Aspects of Novel Materials," for U.S. and Latin American scholars at the Santa

Barbara International Center for Materials Research. The course was held on the UCSB campus and was attended by students from UCSB, UCLA and Latin America.

GUEST EDITOR (with Profs. Bart Kahr and Jennifer Swift) of a special issue of *Crystal Growth and Design* in honor of the 65th year of Prof. J. Michael McBride. This issue appeared in Nov. 2005.

VISITING PROFESSORSHIPS: During the summers of 2000 and 2001, 2006, 2007 and in the spring and summer of 2005, I have been a Visiting Professor in the Condensed Matter and Materials Group in the Department of Physics at the University of Rennes in Rennes, France. I have also been a Visiting Professor in the Department of Chemistry at the University of Bordeaux in July of 2006. I will be a Visiting Professor in Rennes this autumn.

CHAIR – COLLEGE ENVIRONMENTAL HEALTH AND SAFETY COMMITTEE: In 2005, I chaired a committee of six faculty members that initiated and oversaw a waste audit that was mandated by the EPA as part of a consent agreement to reduce a substantial fine from KSU for violations of the Resource Conservation and Recovery Act. This very successful audit covered almost every room in the College of Arts and Sciences.

RHODES/MARSHALL SELECTION COMMITTEE: At Kansas State University, I have been serving on the Rhodes/Marshall Scholar selection and advisory committee (2002-present).

INFORMATION RESOURCE MANAGEMENT COUNCIL, KANSAS STATE UNIVERSITY: This committee advises the Provost on policies regarding all aspects of technology in dissemination, storage and retrieval of information at the university (2005 to present).

WOMEN IN ENGINEERING AND SCIENCE ADVISORY COMMITTEE: I served on the search committee for the Director of the Women in Engineering and Science Program at Kansas State University and subsequently on the advisory committee for that office (1999-2003).

GEOLOGY AND PHYSICS FACULTY SEARCH COMMITTEE: In addition to serving on numerous search committees in chemistry, I have been the outside member of a search committee for a mineralogist/petrologist in the Geology Dept. and a nanobiophysicist in the Physics Dept.

EXPERT CONSULTANT: During the past several years, I have been retained as an expert consultant and expert witness for pharmaceutical companies on several patent cases involving polymorphism and pseudomorphism of crystalline pharmaceuticals and the reactions used to make them. I have also served as an expert consultant for TransForm Pharmaceuticals.

CO-CHAIR: Seventh Midwest Organic Solid State Chemistry Symposium, Bloomington, IN, June 9-10, 1995.

SPECIAL ISSUE OF CHEMISTRY OF MATERIALS - With Michael D. Ward (University of Minnesota), I instigated and coordinated a special issue of *Chemistry of Materials* in honor of the late Margaret C. (Peggy) Etter. Prof. Ward and I selected authors for review articles, refereed a large number of the papers, wrote the introductory material for the issue and sequenced the articles, reviews and communications. This was an extremely successful issue that received wide attention.

GUEST EDITOR (with John Scheffer) of a two-volume (~650 page) issue of *Molecular Crystals and Liquid Crystals:* The Proceedings of the Tenth International Conference on the Chemistry of the Organic Solid State

FACULTY SALARIES AND PROMOTIONS COMMITTEE (FACULTY OF SCIENCE, UNIVERSITY OF ALBERTA) 1989-91. Evaluated approximately 300 faculty dossiers each year for salaries and promotion.

CO-CHAIR: Tenth International Conference on the Chemistry of the Organic Solid State (ICCOSS X), Vancouver, B. C., July 1991.

INTERNATIONAL SCIENTIFIC COMMITTEE: International Conference on the Chemistry of the Organic Solid State: (ICCOSS IX), Como, Italy, July, 1989; (ICCOSS X), Vancouver, British Columbia, July, 1991; (ICCOSS XI), Jerusalem, Israel, July, 1993; Matsuyama, Japan, July 1995, (ICCOSS XII); Stony Brook, New York, July, 1997 (ICCOSS XIII); Cambridge, U.K, July 1999 (ICCOSS XIV); Mainz, Germany, July, 2001 (ICCOSS XV); Sydney, Australia,

July, 2003 (ICCOSS XVI); Los Angeles, CA, July 2005 (ICCOSS XVII), Merida, Venezuela, July 2007 (ICCOSS XVII).

REFEREEING - I have done extensive refereeing for scientific journals (including Science, Nature, Journal of the American Chemical Society, Angewandte Chemie, Chemical Communications, Chemistry of Materials, Journal of Pharmaceutical Sciences, Journal of Inclusion Phenomena and Macrocyclic Chemistry, Organometallics, Tetrahedron Letters, Inorganic Chemistry, Journal of Materials Chemistry, Chemical Reviews, Proceedings of the Royal Society, Section A (Math and Phys. Sci.), Journal of Physical Chemistry, Journal of Organic Chemistry, Acta Crystallographica, Tetrahedron, Journal of Physical Organic Chemistry, Macromolecules, Molecular Crystals and Liquid Crystals, Crystal Growth and Design, Organic Letters, Advanced Functional Materials, Journal of Computational Chemistry, Journal of Solid State Chemistry) and for granting agencies (including the National Science Foundation, Petroleum Research Fund, United States-Israel Binational Science Foundation, Department of Energy, Alzheimer's Association, and the Research Corporation). As part of the latter, I have been a panelist for the Major Research Instrumentation program at the National Science Foundation. (This was under the Chemistry Research Instrumentation and Facilities program and focused on high field NMR proposals.)

TEACHING: At the University of Alberta, I taught introductory organic chemistry to freshmen and a graduate course in organic structural analysis. At Indiana University, I taught a graduate/undergraduate course in spectroscopic methods of structure determination, a graduate course in physical organic chemistry, introductory organic chemistry, first semester organic laboratory, second semester organic laboratory, and honors organic chemistry I and II. At Kansas State University, I have taught a freshman tutorial program, Physical Methods in Inorganic Chemistry, Organic Chemistry I and II, Organic Chemistry Laboratory, General Organic Chemistry, Advanced Organic Chemistry Laboratory, Advanced Organic Chemistry, Physical Organic Chemistry, Organic Spectroscopy, six lectures on tensorial properties of crystals for a team-taught course on Materials Chemistry and the departmental Ethics Seminar for incoming graduate students.

CHEMICAL WEAPONS RISK ASSESSMENT: Because of my calculations and assessment of the public health risk of open-air testing of nerve gases at Defence Research Establishment Suffield in 1988, the Canadian government all but suspended further outdoor testing of these agents.

THE NERVE CENTER: As a graduate student, I helped set up a disarmament organization that focused on disseminating information about chemical and biological weapons. When I moved to England as a postdoctoral student, I continued this work with The Working Party on Chemical and Biological Weapons, a London based defense information/disarmament group.

YALE RECYCLING: Played a major role in the initiation and development of a very successful university-wide recycling program, with over 100 sites in 60 buildings. Negotiated with administration officials at most levels for university support of this recycling program.

CARLETON RECYCLING: Initiated and coordinated a campus-wide recycling program.

NATURALIST: Served as a naturalist for the Carleton Arboretum and for the Branford Land Trust. On three occasions, I helped my ex-wife lead tourist groups on one-week trips to the Peruvian Amazon. Between 1998 and 2003, I also served as a staff member on three of her Earthwatch Expeditions, which focused on bird conservation in a remote cloud forest in Southwestern Ecuador.

HOBBIES AND INTERESTS: bird watching and vocalizations, photography, bicycling, natural history and conservation.