

**Bradley "Peanut" McCoy, Ph. D.**

Professor

Department of Mathematics, Physics, and Statistics

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**Education**

<b>University of Minnesota</b>	<b>2001-2007</b>
Minneapolis, MN	
Doctor of Philosophy, Physics	
<b>California Institute of Technology</b>	<b>1997-2001</b>
Pasadena, CA	
Bachelor of Science, Physics	

**Teaching Experience**

<b>Azusa Pacific University</b>	<b>2007-Present</b>
Azusa, CA	
Assistant Professor	
<b>Ridgewater College</b>	<b>2007</b>
Wilmar, MN	
Adjunct Faculty	

**Awards**

<b>Faculty Uncommon Citizen Award</b>	<b>2018</b>
Azusa Pacific University	
<b>University Leadership Award</b>	<b>2015</b>
Azusa Pacific University	
<b>Outstanding Teaching Assistant Award</b>	<b>2004</b>
School of Physics and Astronomy, University of Minnesota	

**Courses Taught**

Physics for Life Sciences I  
 Physics for Life Sciences II  
 Physics for Science & Engineering I  
 Physics for Science & Engineering II  
 Physics for Science & Engineering III  
 Thermodynamics  
 Quantum Mechanics  
 Mathematical Methods for Physics & Engineering  
 Physics Seminar  
 Physical Science  
 Earth Science  
 Earth Science Concepts & Applications

First-Year Seminar  
Writing 2: Scientific Writing  
Honors Nature  
Assorted labs

### **Curriculum Development**

#### Courses created

Physical Science for Teachers  
Physics for Difference Makers  
Physics for Science & Engineering III  
Physics Research Seminar  
Quantum Mechanics  
Physics Thesis  
Writing 2: Scientific Writing

#### Lab manuals written

Earth Science  
Physics for Difference Makers  
Physics for Life Sciences I & II  
Physics for Science & Engineering I & II  
Honors Nature

### **Committees & Service**

General Education Council (2009-2018, chair 2011-2014)  
Interim Director of General Education (2014-2015)  
General Education Curriculum Committee (chair 2015-2018)  
General Education Assessment Committee (chair 2010-2011)  
General Education Curriculum Design Committee (2014-2015)  
Writing Committee (2014-2015)  
Undergraduate Writing Program Advisory Board (2015-present)  
Writing Across the Curriculum Committee (2015-present)  
Writing Program Special Assistant (January 2017–May 2018)  
General Education-Student Life Task Force (2013-2015)  
General Education-School of Theology Task Force (2014-2015)  
General Education-Diversity Task Force (2014-2015)  
Undergraduate Studies Council (2014-2015)  
American Association of Physics Teachers, Southern California Section (Vice-president for Universities 2014-2017, Section Representative 2018-present)  
American Association of Physics Teachers, History & Philosophy Committee (2017-present)

### **Publications**

Prevention of Epistemological Losses by Discussing Characteristics of Scientists  
B. K. McCoy, Physical Review Special Topics – Physics Education Research (in preparation)

Good Problems Within and Across Disciplines

D. Reinholz, T. Slominski, T. French, S. Pazicni, C. Rasmussen, and B. McCoy, Journal of Research in STEM Education, **4** (1), 37-53 (2018)

Liquid Crystal Mesophases Beyond Commensurate Four-layer Periodicity

C. C. Huang, Shun Wang, LiDong Pan, Z. Q. Liu, B. K. McCoy, Yuji Sasaki, Kenji Ema, P. Barois & Ron Pindak, Liquid Crystal Reviews, **3** (1), 58-78 (2015)

Developing a program-level faith integration curriculum: A case study from physics

B. K. McCoy, Christian Higher Education, **13** (5), 340-351 (2014)

Spontaneous and field-induced mesomorphism of a silyl-terminated bent-core liquid crystal as determined from second-harmonic generation and resonant x-ray scattering

C. Folcia, J. Orgega, J. Etxebarria, S. Rodriguez-Conde, G. Sanz-Enguita, K. Geese, C. Tschierske, V. Ponsinet, P. Barois, R. Pindak, Lidong Pan, Z. Q. Liu, B. K. McCoy, and C. C. Huang, *Soft Matter*, **10**, 196-205 (2013)

Resonant x-ray diffraction study of an unusually large phase coexistence in smectic liquid-crystal films

LiDong Pan, P. Barois, R. Pindak, Z. Q. Liu, B. K. McCoy, and C. C. Huang, *Phys. Rev. Lett.* **108**, 037801 (2012)

Effect of enantiomeric excess on the phase behavior of antiferroelectric liquid crystals

LiDong Pan, B. K. McCoy, Shun Wang, Z. Q. Liu, S. T. Wang, R. Pindak, and C. C. Huang, *Phys. Rev. E* **83**, 069906 (2011)

Surface and Bulk Uniaxial to Biaxial Smectic-A Transition in a Bent Core Liquid Crystal

LiDong Pan, B. K. McCoy, Shun Wang, Wolfgang Weissflog, and C. C. Huang, *Phys. Rev. Lett.* **105** 117802 (2010)

Evolution of a rare sequence of surface transitions with temperature and film thickness

B. K. McCoy, LiDong Pan, Z. Q. Liu, S. T. Wang, Shun Wang, J. W. Goodby, and C. C. Huang, *Phys. Rev. E* **18** 031712 (2010)

Nonplanar tilts in very thin smectic films of one liquid-crystal compound

B. K. McCoy, Z. Q. Liu, S. T. Wang, LiDong Pan, Shun Wang, J. W. Goodby, and C. C. Huang, *Phys. Rev. E* **79** 061702 (2009)

Recovery of a reversed phase sequence in one ternary liquid-crystal-mixture system

Shun Wang, LiDong Pan, B. K. McCoy, S. T. Wang, H. T. Nguyen and C. C. Huang, *Phys. Rev. E* **79** 021706 (2009)

Effects of doping on an unusual smectic- $C^*_\alpha$ -smectic- $C^*_{H2}$ -smectic- $C^*$  phase sequence

B. K. McCoy, Z. Q. Liu, S. T. Wang, LiDong Pan, Shun Wang, H. T. Nguyen, R. Pindak and C. C. Huang, *Phys. Rev. E* **77** 061704 (2008)

Polarization studies of resonant forbidden reflections in liquid crystals

P. Fernandes, P. Barois, S. T. Wang, Z. Q. Liu, B. K. McCoy, C. C. Huang, R. Pindak, W. Caliebe, and H. T. Nguyen, *Phys. Rev. Lett.* **99** 227801 (2007)

Unique pitch evolution in the smectic- $C^*_\alpha$  phase

Z. Q. Liu, B. K. McCoy, S. T. Wang, R. Pindak, W. Caliebe, P. Barois, P. Fernandes, H. T. Nguyen, C. S. Hsu, Shun Wang, and C. C. Huang, *Phys. Rev. Lett.* **99** 077802 (2007)

Smectic- $C^*_\alpha$  phase with two coexistent helical pitch values and a first-order smectic- $C^*_\alpha$  to smectic- $C^*$  transition

B. K. McCoy, Z. Q. Liu, S. T. Wang, R. Pindak, K. Takekoshi, K. Ema, A. Seed, and C. C. Huang, *Phys. Rev. E* **75** 051706 (2007)

Smectic- $C^*_\alpha$  – Smectic- $C^*$  phase transition and critical point in binary mixtures

Z. Q. Liu, S. T. Wang, B. K. McCoy, A. Cady, R. Pindak, W. Caliebe, K. Takekoshi, K. Ema, H. T. Nguyen and C. C. Huang, *Phys. Rev. E* **74** 030702(R) (2006)

Optical studies on the surface-induced tilted layer in freestanding films of two no-layer-shrinkage liquid crystal compounds

S. T. Wang, X. F. Han, Z. Q. Liu, B. K. McCoy, and C. C. Huang, Phys. Rev. E **74** 031707 (2006)

Investigations of nanoscale helical pitch in smectic- $C_{\alpha}^*$  and smectic- $C^*$  phases of a chiral smectic liquid crystal using differential optical reflectivity measurements

V. P. Panov, B. K. McCoy, Z. Q. Liu, J. K. Vij, J. W. Goodby, and C. C. Huang Phys. Rev. E **74** 011701 (2006)

Surface-induced multiple reentrant transitions

B. K. McCoy, Z. Q. Liu, S. T. Wang, V. P. Panov, J. K. Vij, J. W. Goodby and C. C. Huang, Phys. Rev. E **73**, 041704 (2006)

Optical and resonant x-ray diffraction studies confirm a  $SmC_{H12}^*$ - $SmC^*$  liquid crystal phase sequence reversal

S. T. Wang, Z. Q. Liu, B. K. McCoy, R. Pindak, W. Caliebe, H. T. Nguyen, and C. C. Huang, Phys. Rev. Lett. **96**, 097801 (2006)

Vibrating quartz crystal studies of wall-film superfluidity in liquid  $^3\text{He}/^4\text{He}$  mixtures near the tricritical concentration

B. J. Andersson, W. Deng, J. Lee, B. K. McCoy and W. Zimmermann Jr., Jour. Low Temp. Phys. **134** 770 (2004)

### **Presentations:**

Connecting Writing in Physics to General Education Writing Courses

B. K. McCoy, American Association of Physics Teachers, summer National Meeting (2018)

Principles for Successful Community-based General Education Reform

B. K. McCoy, Point Loma Nazarene University colloquium (2017)

Characteristics of Scientists and Analogous Traits of Christians

B. K. McCoy, American Association of Physics Teachers, summer National Meeting (2017)

Improved Epistemology Through Discussions on Characteristics of Scientists

B. K. McCoy, American Association of Physics Teachers, summer National Meeting (2017)

Scaffolding for Scientific Thinking in Non-Quantitative Classes

B. K. McCoy, Breaking Boundaries (2017)

Intervention to Prevent Degradation of Students' Epistemologies

B. K. McCoy, American Association of Physics Teachers, Southern California section meeting (2016)

A Tale of Two Proposals: Principles for Successful GE Reform

B. K. McCoy and B. Lamkin, Association for General and Liberal Studies, national meeting (2016)

How Faith Integration Can Help Students Learn Science

B. K. McCoy, American Scientific Affiliation, national meeting (2016)

Strategies for Encouraging Qualitative Thinking During Problem Solving

B. K. McCoy, American Association of Physics Teachers, summer National Meeting (2014)

Modelling and Incentivizing Qualitative Thinking

B. K. McCoy, American Association of Physics Teachers, Southern California section meeting (2014)

Connecting Epistemology to Students' Religious Beliefs

B. K. McCoy, Physics Education Research Conference (2013)

Why do Faith Integration? A Pedagogical Motivation

B. K. McCoy and J. Groth-Olson, American Scientific Affiliation Southern California Section Meeting (2013)

Outlining a Physics Faith Integration Curriculum

B. K. McCoy, T. Heumier, and C. Bassey, American Scientific Affiliation National Meeting (2012)

Problem Solving and Epistemology in Nonquantitative Introductory Science Classes

B. K. McCoy, American Association of Physics Teachers Summer National Meeting (2011)

Epistemological Effects of a Problem Solving Approach in Nonquantitative Introductory Science Classes

B. K. McCoy, American Physical Society April Meeting (2011)

Problem Solving without the Problems: Training for Scientific Thinking in Conceptual Classes

B. K. McCoy, American Association of Physics Teachers, Southern California section meeting (2010)

Probing the Elusive Orientational Degree of Freedom in Liquid Crystal Molecules

B. K. McCoy, National Synchrotron Light Source at Brookhaven National Laboratory (2006)

Liquid Crystals from Optical Switches to Frustrated Mesophases

B. K. McCoy, Minnesota State University-Mankato, Department of Physics and Astronomy Colloquium (2006)

Detailed Characterization of Five Structure Transitions in one Liquid Crystal Compound

B. K. McCoy, Z. Q. Liu, S. T. Wang, V. P. Panov, J. W. Goodby and C. C. Huang; 2006 International Liquid Crystals Conference

Introductory Physics through Inquiry-based Labs

B. K. McCoy and B. Batell, Classrooms of the Future XI (2005)

Introductory Physics through Inquiry-based Labs

B. K. McCoy and B. Batell, Minnesota Area Association of Physics Teachers Spring Meeting 2005

Inquiry-based Honors Physics Labs

Peter Border, Brian Batell, and B. McCoy, ACM Siggraph 2005: Educators Program

### Associations

American Physical Society

American Association of Physics Teachers

National Association of Geoscience Teachers