

Peter Adrian Beckmann
Department of Physics, Bryn Mawr College
September 2011

Education at the University of British Columbia

1975 PhD Physics
1971 MSc Physics
1969 BSc Physics

Post-Doctoral Position

1975-1977 National Research Council of Canada (NRCC) Postdoctoral Fellow, University of Nottingham, England (NRCC is now called NSERC, National Sciences and Engineering Research Council of Canada)

Positions in the Department of Physics at Bryn Mawr College

2010-2012 Chairman
2005-2007 Chairman
1999-2002 Chairman
1993-1996 Chairman
1987-1989 Chairman
1987-present Professor
1982-87 Associate Professor
1977-82 Assistant Professor

Adjunct Position at the University of Delaware

1997-2007 Research Professor of Physical Chemistry, Department of Chemistry and Biochemistry, University of Delaware, Newark, Delaware

Sabbaticals

2009-2010 Semester 2 at Bryn Mawr College
2007-2008 Semester 1 at Bryn Mawr College
2003-2004 Semester 1 60% at Bryn Mawr College, 40% in the Department of Chemistry and Biochemistry, University of Delaware, Newark, Delaware
1997-1998 full year in the Department of Chemistry and Biochemistry, U Delaware
1990-1991 semester 2 at Bryn Mawr College
1984-1985 full year in the Department of Chemistry, University of British Columbia, Vancouver, British Columbia, Canada
1980-81 Junior Faculty Leave, full year in the Department of Chemistry, Southampton University, Southampton, England

Refereed Publications

*Bryn Mawr College Undergraduate Student at time of contribution.

**Bryn Mawr College Graduate Student at time of contribution.

67. Intramolecular and Intermolecular Contributions to the Barriers for Rotation of Methyl Groups in Crystalline Solids: Electronic Structure Calculations and Solid State NMR Relaxation Measurements. X Wang,** P A Beckmann, C W Mallory, A L Rheingold, A G DiPasquale, P Carroll, and F B Mallory 2011 J Org Chem, 76, 5170-5176.
66. A proton spin-lattice relaxation rate study of methyl and *t*-butyl group reorientation in the solid state. L C Popa,* A L Rheingold, and P A Beckmann 2010 Sol State Nuc Mag Resonan 38 31-35.
65. A review of polytypism in lead iodide. P A Beckmann 2010 Cryst Res Technol 45 455-460.
64. Methyl and *t*-butyl reorientation in an organic molecular solid. P A Beckmann, W G Dougherty Jr, and W S Kassel 2009 Sol State Nuc Mag Resonan 36 86-91.
63. ¹¹⁹Sn spin-lattice relaxation in α -SnF₂. G Neue, S Bai, R E Taylor, P A Beckmann, A J Vega, and C Dybowski 2009 Phys Rev B 79 214302 1-5.
62. ²⁰⁷Pb chemical shielding in PbMoO₄ and PbCl₂: The effects of temperature and lattice expansion. O Dmitrenko, S Bai, P A Beckmann, S van Bramer, A J Vega, and C Dybowski 2008 J Phys Chem A 112 3046-3052.
61. The quenching of isopropyl group rotation in van der Waals molecular solids. X Wang, A L Rheingold, A G DiPasquale, F B Mallory, C W Mallory, and P A Beckmann 2008 J Chem Phys 128 124502 1-3.
60. The relationship between crystal structure and NMR relaxation in molecular solids with *t*-butyl groups. A L Rheingold, A G DiPasquale, and P A Beckmann 2008 Chem Phys 345 116-118.
59. ²⁰⁷Pb spin-lattice relaxation in solid PbMoO₄ and PbCl₂. P A Beckmann, S Bai, A J Vega, and C Dybowski 2006 Phys Rev B 74 214421 1-4.
58. Spin-lattice relaxation of heavy spin- $\frac{1}{2}$ nuclei in diamagnetic solids. A Raman process mediated by the spin-rotation interaction. A J Vega, P A Beckmann, S Bai, and C Dybowski 2006 Phys Rev B 74 214420 1-16.
57. CF₃ rotation in 3-(trifluoromethyl)phenanthrene: X-ray diffraction and ab initio electronic structure calculations. X Wang,** F B Mallory, C W Mallory, P A Beckmann, A L Rheingold, and M M Francl 2006 J Phys Chem A 110 3954-3960.
56. CF₃ rotation in 3-(trifluoromethyl)phenanthrene: Solid state ¹⁹F and ¹H NMR relaxation and Bloch-Wangsness-Redfield Theory. P A Beckmann, J Rosenberg,* K Nordstrom,* C W Mallory, and F B Mallory 2006 J Phys Chem A 110, 3947-3953.
55. ¹¹¹Cd and ¹¹³Cd spin-lattice relaxation in solid CdMoO₄ by paramagnetic centers in the absence of spin diffusion. P A Beckmann, S Bai, and C Dybowski 2005 Phys Rev B 71 012410 1-2.
54. The relationship between crystal structure and methyl and *t*-butyl group dynamics in van der Waals organic solids. P A Beckmann, C Paty*, E Allocco*, M Herd*, C Kuranz,* and A L Rheingold 2004 J Chem Phys 120 5309-5314.

53. Methyl and *t*-butyl group reorientation in planar aromatic solids: Low-frequency NMR relaxometry and X-ray diffraction. P A Beckmann, C A Buser,* K Gullifer,** F B Mallory, C W Mallory, G M Rossi, and A L Rheingold 2003 J Chem Phys 118 11129-11138.
52. Solid state proton spin-lattice relaxation in four structurally related organic molecules. P A Beckmann, K S Burbank,* M M W Lau,* J N Ree,* and T L Weber* 2003 Chem Phys 290 241-250.
51. Methyl group rotation and ¹H and ²H Zeeman relaxation in organic solids. P A Beckmann, C Dybowski, E J Gaffney, C W Mallory, and F B Mallory 2001 J Phys Chem A 105 7350-7355.
50. A new mechanism for spin-lattice relaxation of heavy nuclei in the solid state: ²⁰⁷Pb relaxation in lead nitrate. J B Grutzner, K W Stewart, R E Wasylshen, M D Lumsden, C Dybowski, and P A Beckmann 2001 J Amer Chem Soc 123 7094-7100.
49. A thermometer for non-spinning solid state NMR spectroscopy. P A Beckmann and C Dybowski 2000 J Mag Resonan 146 379-380.
48. ¹H NMR spin-lattice relaxation, ¹³C magic-angle-spinning NMR spectroscopy, differential scanning calorimetry, and X-ray diffraction of two polymorphs of 2,6-di-*t*-butylnaphthalene. P A Beckmann, K S Burbank,* K M Clemo,* E N Slonaker,* K Averill, C Dybowski, J S Figueroa, A Glatfelter, S Koch, L M Liable-Sands, and A L Rheingold 2000 J Chem Phys 113 1958-1965.
47. Unusual proton zeeman spin relaxation in an organic solid: Several crystal polymorphs or different glass structures? J A Weiss* and P A Beckmann 2000 Sol State Nuc Mag Resonan 16 239-244.
46. Superlattices, polymorphs, and solid state NMR spin-lattice relaxation measurements of 2,6-di-*t*-butylnaphthalene. A L Rheingold, J S Figueroa, C Dybowski, and P A Beckmann 2000 Chem Comm 651-652. (Year is volume number.)
45. Methyl reorientation in solid 3-ethylchrysene and 3-isopropylchrysene. P A Beckmann, C A Buser,* C W Mallory, F B Mallory, and J Mosher* 1998 Sol State Nuc Mag Resonan 12 251-256.
44. Proton spin-lattice relaxation in amorphous states of organic molecular solids. M T Myaing,* L Sekaric,* and P A Beckmann 1997 Zeitschrift für Naturfor 52a 757-764.
43. Proton spin-lattice relaxation, methyl group rotation, and states of an organic solid. P A Beckmann and B A Roe* 1996 J Phys: Cond Matter 8 7991-7999.
42. Solid state proton spin relaxation and methyl reorientation in isopropylbenzene. A L Plofker* and P A Beckmann 1995 J Phys Chem 99 391-394.
41. Solid state proton spin relaxation and methyl and *t*-butyl reorientation. P A Beckmann, H A Al-Hallaq,* A M Fry,* A L Plofker,* B A Roe,* and J A Weiss* 1994 J Chem Phys 100 752-753.
40. Proton spin relaxation, internal motion, and structure in solid 1,2,4,5-tetraisopropylbenzene. H A Al-Hallaq* and P A Beckmann 1993 J Chem Soc: Faraday Trans 89 3801-3804.

39. Dipole-dipole spin relaxation in solids. The unrestricted hopping model and the methyl proton - non-methyl proton interaction. C A Palmer,** A M Albano, and P A Beckmann 1993 *Physica B* 190 267-284.
38. Proton spin relaxation and thermal history effects in organic molecular solids. P A Beckmann, in *Physics and chemistry of finite systems: from clusters to crystals*, ed P Jena, S N Khanna, and B K Rao 1992 Kluwer Academic, Netherlands 1 357-362.
37. Solid state proton spin relaxation and *t*-butyl and methyl group reorientation in 1-bromo-2,4,6-tri-*t*-butylbenzene. A M Fry,* P A Beckmann, A J Fry, P C Fox, and A Isenstadt 1991 *J Chem Phys* 95 4778-4782.
36. Solid state proton spin relaxation in ethylbenzenes: Methyl reorientation barriers and molecular structure. P A Beckmann, L Happersett, A V Herzog,* and W M Tong 1991 *J Chem Phys* 95 828-835.
35. Proton zeeman relaxation and intramolecular reorientation in solid *t*-butylbenzene. P A Beckmann, R M Hathorn,* and F B Mallory 1990 *Mol Phys* 69 411-428.
34. Methyl reorientation in methylphenanthrenes. II. Solid-state proton spin-lattice relaxation in the 1-CH₃, 9-CH₃, and 1-CD₃, 9-CH₃ systems. F B Mallory, C W Mallory, K G Conn,** and P A Beckmann 1990 *J Phys Chem Sol* 51 129-134.
33. Thermally activated *t*-butyl and methyl reorientation in solids. P A Beckmann 1989 *Phys Rev B* 39 12248-12249.
32. Spectral densities and nuclear spin relaxation in solids. P A Beckmann 1988 *Phys Rep* 171 85-128. (This a *major* review.)
31. Nuclear-spin relaxation in molecular solids with reorienting methyl and *t*-butyl groups: The spectral density and the state of the solid. P A Beckmann, A I Hill,* E B Kohler,* and H Yu** 1988 *Phys Rev B* 38 11098-11111.
30. Methyl reorientation in methylphenanthrenes. I. Solid state proton spin-lattice relaxation in the 3-methyl, 9-methyl, and 3,9-dimethyl systems. K G Conn,** P A Beckmann, C W Mallory, and F B Mallory 1987 *J Chem Phys* 87 20-27.
29. Nuclear spin-lattice relaxation rates in liquid crystals. Results for deuterons in specifically deuterated 4-n-pentyl-4'-cyanobiphenyl in both nematic and isotropic phases. P A Beckmann, J W Emsley, G R Luckhurst, and D L Turner 1986 *Molec Phys* 59 97-125.
28. Deuteron Zeeman relaxation of CD₄ in the isotropic liquid, the liquid crystalline, and the solid state of several substances. P A Beckmann, M Bloom, and E E Burnell 1986 *J Chem Phys* 84 5898-5905.
27. Nuclear magnetic resonance spectroscopy and relaxation in molecular solids containing isopropyl groups. Part 2 - The large two phase temperature region in 1,4-di-isopropylbenzene. P A Beckmann 1986 *J Chem Soc: Faraday Trans 2* 82 477-484.
26. Deuteron nuclear magnetic resonance and orientational order in binary mixtures of liquid crystals. G S Bates, P A Beckmann, E E Burnell, G L Hoatson, and P Palfy-Muhoray 1986 *Molec Phys* 57 351-357.

25. Methyl and *t*-butyl reorientation and distributions of activation energies in molecular solids. A nuclear spin relaxation study in 2,4- and 2,5-di-*t*-butylhydroxybenzene. P A Beckmann, A M Cheung,* E E Fisch,* F A Fusco,* R E Herzog,* and M Narasimhan* 1986 J Chem Phys 84 1959-1968.
24. Nuclear spin relaxation and internal motion in molecular solids containing isopropyl groups. Part 1 - An introductory Zeeman relaxation study. P A Beckmann, A M Cheung,* R E Herzog,* E E Fisch,* M Narasimhan,* C W Mallory, and F B Mallory 1985 J Chem Soc: Faraday Trans 2 81 1013-1021.
23. Nuclear spin relaxation study of internal motion in two organic molecular solids. A M Albano, P A Beckmann, M E Carrington,* E E Fisch,* F A Fusco,* A E O'Neill,* and M E Scott** 1984 Phys Rev B 30 2334-2339.
22. Proton spin-lattice relaxation and intramolecular reorientation in solids. P A Beckmann, F A Fusco,* and A E O'Neill* 1984 J Mag Resonan 59 63-70.
21. Molecular dynamics in a liquid crystal. Measurement of spectral densities at several sites in the nematogen 4-*n*-pentyl-4'-cyanobiphenyl. P A Beckmann, J W Emsley, G R Luckhurst, and D L Turner 1983 Molec Phys 50 699-725.
20. A general NMR spectral density and its experimental verification. A M Albano, P A Beckmann, M E Carrington,* F A Fusco,* A E O'Neill,* and M E Scott* 1983 J Phys C 16 L979-L983.
19. Pretransitional behaviour in nematic liquid crystals: A nuclear magnetic resonance study. G S Attard, P A Beckmann, J W Emsley, G R Luckhurst, and D L Turner 1982 Molec Phys 45 1125-1129.
18. Methyl and *t*-butyl reorientation in molecular solids. P A Beckmann 1981 Chem Phys 63 359-375.
17. Intramolecular reorientations and the effects of thermal history and hydrogen bonding in four closely related organic molecular solids. M C Aronson,* P A Beckmann, R J Ross,* and S L Tan* 1981 Chem Phys 63 349-358.
16. Proton spin-lattice relaxation in MBDBP. The effects of superimposed intramolecular reorientations. M C Aronson,* P A Beckmann, V Guerra,* C M Schwamb,** and S L Tan* 1980 Molec Phys 41 1239-1258.
15. Superpositions of intramolecular reorientations and nuclear spin relaxation. P A Beckmann 1980 Molec Phys 41 1227-1238.
14. A deuterium nuclear magnetic resonance study of chain disorder in lamellar potassium palmitate: The effect of long and short chain guests. P A Beckmann, E E Burnell, M A Heldman, K R Northey, and T P Higgs 1980 Can J Phys 58 1544-1554.
13. Proton spin-lattice relaxation in meta-carborane. P A Beckmann and A Wendel 1980 J Chem Phys 73 3514-3515.
12. Solid state phase transitions and molecular reorientation in ortho- and para-carborane: An isomer effect. P A Beckmann and A J Leffler 1980 J Chem Phys 72 4600-4607.
11. Proton spin relaxation and methyl and hydroxy group motion. P A Beckmann 1979 J Mag Resonan 36 199-205.

10. Proton spin-lattice relaxation and methyl group rotation. P A Beckmann, C I Ratcliffe, and B A Dunell 1978 J Mag Resonan 32 391-402.
 9. Electron spin relaxation and tunnelling methyl groups. P A Beckmann and S Clough 1978 J Phys C 11 4055-4067.
 8. The electron - methyl group spin-spin interaction. P A Beckmann 1977 Molec Phys 34 665-680.
 7. Nuclear spin relaxation and centrifugal distortion effects in dilute silane gas. P A Beckmann and E E Burnell 1977 Can J Phys 55 1354-1355.
 6. Nuclear spin-lattice relaxation and activation energies of tunnelling methyl groups. P A Beckmann and S Clough 1977 J Phys C 10 L231-L236.
 5. The Haupt Effect: Coupled rotational and dipolar relaxation of methyl groups. P A Beckmann, S Clough, J W Hennel, and J R Hill 1977 J Phys C 10 729-742.
 4. Nuclear spin relaxation by intramolecular interactions in gases of homonuclear diatomic molecules. M Bloom, P A Beckmann, and B C Sanctuary 1976 Can J Phys 54 2209-2212.
 3. Proton spin relaxation in dilute methane gas: A symmetrized theory and its experimental verification. P A Beckmann, M Bloom, and I Ozier 1976 Can J Phys 54 1712-1727.
 2. Nuclear spin relaxation in low-density molecular hydrogen at room temperature. P A Beckmann, E E Burnell, K Lalita, R L Armstrong, K E Kisman, and F R McCourt 1972 Phys Rev A 6 1684-1686.
 1. Observation of the influence of centrifugal distortion of the methane molecule on nuclear spin relaxation in the gas. P A Beckmann, M Bloom, and E E Burnell 1972 Can J Phys 50 251-258.
- B. Nuclear spin relaxation in methane gas. P A Beckmann 1975 PhD Thesis, University of British Columbia, 321 pages (unpublished).
- A. Spin-lattice relaxation in gaseous methane. P A Beckmann 1971 MSc Thesis, University of British Columbia, 97 pages (unpublished).

Current Collaborators

My research currently involves the coming together of several independent laboratories each contributing its speciality. I have several active research collaborators in several institutions in the USA and around the world. These are not past co-authors of published papers. These are colleagues involved with on-going, as-yet unpublished projects.

(1) Frank Mallory in the Chemistry Department of Bryn Mawr College and (2) Sally Mallory in the Chemistry Department at the University of Pennsylvania synthesize many compounds I use in my nuclear spin relaxation experiments. In addition, Frank Mallory and I have spent a lifetime educating each other and it has been one of the most rewarding aspects of my professional life. The Beckmann Laboratory currently works with three groups who grow the single crystals of the compounds we use and who then perform small-molecule X-ray Diffraction experiments to determine both the molecular and crystal structure: (3) Arnold Rheingold in the Department of Chemistry and Biochemistry at the University of California at San Diego; (4) Scott Kassal and (5) Bill Dougherty in the Department of Chemistry at Villanova University, and (6) Hong Su in

the Department of Chemistry at the University of Cape Town in South Africa. (7) Xianlong Wang at the School of Life Science and Technology in the University of Electronic Science and Technology of China in Chengdu, China, performs electronic structure calculations to calculate parameters we use both in the theoretical models and in fitting the nuclear spin relaxation data. (8) Cecil Dybowski and (9) Steve Bai are long-standing collaborators in the Department of Chemistry and Biochemistry at the University of Delaware. Our projects involve Pb-207 NMR spectroscopy and relaxation. (10) Robert Taylor in the Department of Chemistry at the University of California, Los Angeles, has teamed up with us to do solid state NMR experiments at NMR frequencies not available at either Bryn Mawr or Delaware. (11) An exciting new adventure starting 2010 is working with Lolita Rotkina at the Regional Nanotechnology Facility in the Laboratory for Research on the Structure of Matter (LRSM) at the University of Pennsylvania performing scanning electron microscopy (SEM) experiments on the samples.

Refereeing

2000's:

- (1) The Journal of Chemical Physics
- (2) Chemical Communications of the Royal Society
- (3) The Journal of Physical Chemistry
- (4) Solid State Nuclear Magnetic Resonance
- (5) Journal of Physics: Condensed Matter
- (6) American Journal of Physics
- (7) Applied Spectroscopy
- (8) Physical Review Letters
- (9) The New Journal of Physics
- (10) The Journal of Molecular Structure

1990's: some of the above plus

- (11) Chemical Physics
- (12) Physical Chemistry Chemical Physics of the Royal Society
- (13) Journal of Physics D: Applied Physics
- (14) Physical Review B

1980's: some of the above plus

- (15) Physica B
- (16) Physical Review E
- (17) The Journal of Magnetic Resonance
- (18) Molecular Physics

I limit refereeing to 4 papers a year. I stop refereeing for some journals and start with others as my research changes direction and the journal's area also change direction.

Talks, Colloquia, and Posters

I list only those talks and posters I have personally given. I long ago lost any lists I might have had showing the many talks and posters given by others with my name on the paper. I have certainly consciously "slowed down" over the last few years. I choose to go to fewer and fewer meetings as I find international email to be much more efficient mode of collaboration and learning.

102. October 2008 "Thirty years of nuclear spin relaxation at Bryn Mawr College." College lecture in honor of my receiving the Marion Reilly Professor of Physics Chair, Bryn Mawr, Pennsylvania, USA.
101. June 2007 "Relaxation in heavy spin $\frac{1}{2}$ nuclei." Invited lecture, Solid-State NMR Spectroscopy of Metals in Biological Systems and Materials, Newark, Delaware, USA.
100. April 2007 "The introductory physics laboratory: A different approach." Invited lecture, Southeast Pennsylvania American Association of Physics Teachers, Swarthmore Pennsylvania, USA.
99. July 2006 "Spin-lattice relaxation of ^{207}Pb and other heavy spin- $\frac{1}{2}$ nuclei relaxation in diamagnetic ionic solids due to spin-rotation interaction randomly modulated by crystal vibrations." Contributed poster for the 48th Rocky Mountain Conference on Analytical Chemistry, Denver, Colorado, USA.
98. July 2005 "Nuclear spin relaxation in simple heavy-metal spin- $\frac{1}{2}$ salts." Contributed poster for the 47th Rocky Mountain Conference on Analytical Chemistry, Denver, Colorado, USA.
97. June 2005 "Low-frequency ^1H and ^{19}F spin-lattice relaxation in a model organic solid." Contributed poster for the Gordon Conference on Magnetic Resonance, Connecticut College, New London, Connecticut, USA.
96. November 2001 "Lead-207 solid state NMR spectroscopy and relaxometry." Self-invited colloquium, Department of Chemistry, Bryn Mawr College, Bryn Mawr, Pennsylvania, USA.
95. June 2001 "Methyl group rotation and ^1H and ^2H Zeeman relaxation in organic solids." Contributed poster, Gordon Conference on Nuclear Magnetic Resonance, Bristol, Rhode Island, USA.
94. April 2000 "Physics, biology, your brain, and everything else." Invited presentation, Bryn Mawr College Alumnae Association of Fairfield County, Fairfield County, Connecticut, USA.
93. March 2000 "Structure and motion in molecular solids: X-ray crystallography and solid state dynamic nuclear magnetic resonance." Invited colloquium, Department of Physics, State University of New York at Fredonia, New York, USA.
92. March 2000 "Physics, biology, your brain, and everything else." Invited lecture for the general public, State University of New York at Fredonia, New York, USA.
91. January 2000 "Physics: The art of story telling," Invited colloquium, Department of Physics, University of North Carolina, Wilmington, North Carolina, USA.
90. January 2000 "Physics, biology, your brain, and everything else." Invited lecture for the general public, University of North Carolina, Wilmington, North Carolina, USA.
89. November 1999 "Physics, biology, your brain, and everything else." Invited presentation, Waverly Heights (a Retirement Community), Gladwyne, Pennsylvania, USA.
88. September 1999 "Physics, biology, your brain, and everything else." Invited luncheon speaker, Senior Men's Club, Bryn Mawr, Pennsylvania, USA.

87. June 1999 "Lead-207 Zeeman relaxation in lead nitrate." Contributed poster, Gordon Conference on Nuclear Magnetic Resonance, Henniker, New Hampshire, USA.
86. December 1998 "Physics, biology, your brain, and everything else." Invited presentation, The Quadrangle (a Retirement Community), Havertown, Pennsylvania, USA.
85. October 1998 "Physics, biology, your brain, and everything else." Invited presentation, Bryn Mawr College Alumnae Association of Southern California, Pasadena, California, USA.
84. June 1998 "A physics undergraduate success story: Good physics, good fun, and a supportive family atmosphere." Invited speaker, Canadian Association of Physicists Annual Meeting, Waterloo, Ontario, Canada.
83. April 1998 "A physics undergraduate success story: Good physics, good fun, and a supportive family atmosphere." Invited round table discussion leader, Department of Physics, Brock University, St Catharines, Ontario, Canada.
82. April 1998 "Structure and motion in molecular solids: X-ray crystallography and solid state dynamic nuclear magnetic resonance." Invited colloquium, Department of Physics, Brock University, St Catharines, Ontario, Canada.
81. March 1998 "Proton and lead-207 spin relaxation and x-ray crystallography in molecular and ionic solids: Structure and motion." Invited group presentation, Nuclear Magnetic Resonance Spectroscopy Group, Department of Physics, University of British Columbia, Vancouver, British Columbia, Canada.
80. March 1998 "Physics, biology, your brain, and everything else." Invited lecture for the general public under the American Institute of Physics Visiting Scientist Program, Okanagan University College, Vernon Campus, Vernon, British Columbia, Canada.
79. March 1998 "How scientists model the world." Invited lecture (four times) at four local high schools under the American Institute of Physics Visiting Scientist Program, Kelowna, British Columbia, Canada.
78. March 1998 "The concept of unification in physics: A drive for simplicity and beauty." Invited lecture under the American Institute of Physics Visiting Scientist Program, Department of Physics, Okanagan University College, Kelowna, British Columbia, Canada.
77. March 1998 "Physics, biology, your brain, and everything else." Invited lecture for the general public under the American Institute of Physics Visiting Scientist Program, Okanagan University College, North Kelowna Campus, Kelowna, British Columbia, Canada.
76. March 1998 "How scientists model the world." Invited lecture at a local high school under the American Institute of Physics Visiting Scientist Program, Kamloops, British Columbia, Canada.
75. March 1998 "The concept of unification in physics: A drive for simplicity and beauty." Invited lecture under the American Institute of Physics Visiting Scientist Program, Department of Physics, The University College of the Cariboo, Kamloops, British Columbia, Canada.

74. March 1998 "Physics, biology, your brain, and everything else." Invited lecture for the general public under the American Institute of Physics Visiting Scientist Program, The University College of the Cariboo, Kamloops, British Columbia, Canada.
73. February 1998 "Structure and motion in molecular solids: X-ray crystallography and solid state dynamic nuclear magnetic resonance." Colloquium, Department of Physics, Bryn Mawr College, Bryn Mawr, Pennsylvania, USA.
72. November 1997 "The mental concept of clarinetness: The physics and biology of modeling sound waves." Invited colloquium, Lebanon Valley College, Annville, Pennsylvania, USA.
71. March 1997 "The physics of music and musical instruments." Invited lecture for the general public, Millersville University, Millersville, Pennsylvania, USA.
70. March 1997 "Proton spin, internal rotation in molecules, and the states of solids." Invited senior seminar speaker, Millersville University, Millersville, Pennsylvania, USA.
69. October 1996 "Teaching physics in second grade elementary school and first year college: The same stuff and the same approach." Invited lecture, American Association of Physics Teachers Northeast Regional Conference, Brookhaven National Laboratories, Upton, New York, USA.
68. September 1996 "Nuclear spin relaxation in organic molecular solids." Invited colloquium, Department of Chemistry, University of Delaware, Newark, Delaware, USA.
67. July 1996 "Methyl groups: Observers of the states of organic solids." Contributed poster, Gordon Conference on Order/Disorder in Solids, New London, New Hampshire, USA.
66. October 1995 "The physics of music and musical instruments." Invited colloquium, Moravian College, Allentown, Pennsylvania, USA.
65. February 1995 "All of physics in 45 minutes." Invited lecture to physics students at the University of Richmond, Richmond, Virginia, USA.
64. October 1995 "The physics of music and musical instruments." Invited colloquium, Moravian College, Allentown, Pennsylvania, USA.
63. February 1995 "Physics and music." Invited public lecture, University of Richmond, Richmond, Virginia, USA.
62. August 1994 "Proton spin relaxation and order/disorder in organic solids." Contributed poster, Gordon Conference on Order/Disorder in Solids, New London, New Hampshire, USA.
61. December 1993 "Future directions in nuclear magnetic resonance." Invited roundtable discussion leader, Symposium on Nuclear Magnetic Resonance; the Past, the Present and the Future. A Commemorative Symposium to Honour Myer Bloom on the Occasion of His Retirement. Whistler Mountain, British Columbia, Canada.
60. June 1993 "An example of how insight, closed-form mathematical modeling, and computer-based symbolic mathematics can help in doing interesting science: Nuclear

- spin relaxation in solids." Contributed talk, 11th Army Conference on Applied Mathematics and Computing, Pittsburgh, Pennsylvania, USA.
59. April 1993 "Computer-based symbolic mathematics and nuclear spin relaxation in solids." Contributed talk, Joint Meeting of the American Physical Society and the American Association of Physics Teachers, Washington, DC, USA.
 58. February 1993 "The scientific mind." Invited luncheon speaker, Senior Men's Club, Bryn Mawr, Pennsylvania, USA.
 57. October 1992 "The solar system: myth and beauty." Invited colloquium, Physics Department, Lebanon Valley College, Lebanon, Pennsylvania, USA.
 56. July 1992 "The solar system: myth and beauty." Invited colloquium, The Quadrangle (a Retirement Community), Havertown, Pennsylvania, USA.
 55. January 1992 "The universe: From the beginning to the end." Invited colloquium, Physics Department, Trenton State College, Trenton, New Jersey, USA.
 54. October 1991 "Organic molecular solids: The role of time and temperature." Contributed poster, International Symposium on the Physics and Chemistry of Finite Systems: From Clusters to Crystals, Richmond, Virginia, USA.
 53. September 1991 "Nuclear magnetic resonance in physics, chemistry, biology and medicine." Invited colloquium under the American Institute of Physics Visiting Scientist Program, Ripon College, Ripon, Wisconsin, USA.
 52. September 1991 "The physics of music." Invited colloquia under the American Institute of Physics Visiting Scientist Program, Ripon College, Ripon, Wisconsin, USA.
 51. February 1991 "Nuclear magnetic resonance and the nature of molecular motion." Invited colloquium, Physics Department, Villanova University, Villanova, Pennsylvania, USA.
 50. November 1990 "Nuclear spin relaxation and the measurement of low activation energies in organic molecular solids." Contributed talk, 29th Eastern Analytical Symposium, Somerset, New Jersey, USA.
 49. February 1990 "Nuclear spin relaxation in solids." Invited colloquium, Rutgers University, Camden Campus, Camden, New Jersey, USA.
 48. May 1989 "Berry's phase in quantum mechanics." Invited discussion leader, Saint Mary's College, Saint Mary's, Maryland, USA.
 47. April 1989 "Nuclear magnetic resonance in physics, chemistry, biology and medicine." Invited colloquia under the American Institute of Physics Visiting Scientist Program, Augustus Adolphus College, Saint Peter, Minnesota, USA.
 46. April 1989 "The physics of music." Invited colloquia under the American Institute of Physics Visiting Scientist Program, Augustus Adolphus College, Saint Peter, Minnesota, USA.
 45. March 1989 "Nuclear magnetic resonance in physics, chemistry, biology and medicine." Invited colloquium, Dickinson College, Carlisle, Pennsylvania, USA.
 44. April 1988 "Nuclear spin relaxation and thermal history effects in organic molecular solids." Contributed talk, Spring Meeting of the American Physical Society, Baltimore, MD, USA.

43. February 1988 "Deuteron NMR spectroscopy, binary mixtures of liquid crystals and mean field theory." Invited colloquium, Millersville University, Millersville, Pennsylvania, USA.
42. October 1987 "NMR in physics, chemistry, biology, geology and medicine." Invited talk, Annual Meeting of the Montgomery County Science Teachers Association, Philadelphia, Pennsylvania, USA.
41. October 1987 "The universe: The beginning to the end." Invited talk, Annual Meeting of the Montgomery County Science Teachers Association, Philadelphia, Pennsylvania, USA.
40. October 1987 "Fundamental particle physics for elementary school children." Invited talk, Annual Meeting of the Montgomery County Science Teachers Association, Philadelphia, Pennsylvania, USA.
39. September 1987 "Nuclear spin relaxation in solids." Colloquium, Department of Physics, Bryn Mawr College, Bryn Mawr, Pennsylvania, USA.
38. September 1987 "Nuclear spin relaxation in the solid state: The 1,3- and 1,4-isomers of ditertiarybutylbenzene." Contributed poster, Twentieth Eastern Analytical Symposium, New York, New York, USA.
37. September 1987 "Fundamental particles and forces in physics." Invited talk, Prospective Students Day, Bryn Mawr College.
36. April 1986 "The large two-phase region in 1,4-diisopropylbenzene." Contributed poster, Twenty Sixth Experimental Nuclear Magnetic Resonance Conference, Baltimore, Maryland, USA.
35. February 1986 "Deuteron NMR spectroscopy, binary mixtures of liquid crystals and mean field theory." Invited colloquium, E.I. du Pont de Nemours Co., Wilmington, Delaware, USA.
34. September 1985 "The large two-phase region in 1,4-diisopropylbenzene." Contributed poster, Federation of Analytical Chemistry and Spectroscopy Societies Conference, Philadelphia, Pennsylvania, USA.
33. June 1985 "Molecular dynamics in liquid crystals. The measurement of spin-lattice relaxation rates and spectral densities at several sites in a nematogenic molecule." Contributed poster, Gordon Research Conference on Nuclear Magnetic Resonance, Wolfeboro, New Hampshire, USA.
32. June 1985 "Nuclear spin relaxation in molecular solids." Invited talk, Waterloo Summer NMR Institute, Waterloo, Ontario, Canada.
31. February 1985 "Deuteron magnetic resonance selective and non-selective excitation relaxation spectroscopy." Invited colloquium, Physical Chemistry Seminar, Chemistry Department, University of California, San Diego, La Jolla, California, USA.
30. October 1984 "Deuteron magnetic resonance in liquid crystals." Invited colloquium, Physics Department, University of British Columbia, Vancouver, British Columbia, Canada.

29. September 1984 "Methyl and tert-butyl reorientation in molecular solids." Invited talk, Joint Physics/Chemistry Liquid Crystal Seminar, University of British Columbia, Vancouver, British Columbia, Canada.
28. July 1984 "Molecular dynamics in liquid crystals. The measurement of spin-lattice relaxation rates and of spectral densities at several sites in a nematogenic molecule." Contributed poster, Tenth International Liquid Crystal Conference, York University, York, UK.
27. July 1984 "Molecular motion and spectral densities: fundamental theory." Invited talk, Joint Physics/Chemistry Liquid Crystal Seminar, University of British Columbia, Vancouver, British Columbia, Canada.
26. February 1984 "Some fundamental aspects of the relationship between intramolecular reorientation and nuclear spin relaxation in molecular solids." Department of Physics, Bryn Mawr College, Bryn Mawr, Pennsylvania, USA.
25. October 1983 "The fundamental forces and particles in nature." Invited colloquium, Physics Department, Ursinus College, Collegeville, Pennsylvania, USA.
24. October 1983 "Nuclear spin relaxation and methyl reorientation in solids." Colloquium, Department of Chemistry, Bryn Mawr College, Bryn Mawr, Pennsylvania, USA.
23. July 1983 "Nuclear spin relaxation in liquid crystals." Invited round table discussion chairman, NATO Advanced Study Institute on NMR of Liquid Crystals, San Miniato, Italy.
22. April 1983 "Nuclear magnetic resonance in physics, chemistry, biology and medicine." Invited talk, Sigma Xi Induction, Department of Physics, Lycoming College, Williamsport, Pennsylvania, USA.
21. October 1982 "Molecular dynamics in liquid crystals. The measurement of spin-lattice relaxation rates and spectral densities at several sites in a nematogenic molecule." Contributed poster, First British Liquid Crystal Group Conference, University of Southampton, Southampton, UK.
20. April 1982 "The fundamental forces and particles in nature." Invited talk, The Lower Merion Discussion Group, Lower Merion, Pennsylvania, USA.
19. April 1982 "Selective excitation deuteron magnetic resonance spectroscopy." Contributed poster, Twenty Second Experimental Nuclear Magnetic Resonance Conference, Madison, Wisconsin, USA.
18. February 1982 "The fundamental forces and particles in nature." Invited talk, Bryn Mawr College Parents' Day Lecture.
17. October 1981 "An introduction to deuteron magnetic resonance and liquid crystals." Colloquium, Joint Physics and Chemistry Departments, Bryn Mawr College, Bryn Mawr, Pennsylvania, USA.
16. October 1981 "The Haupt effect: Coupled rotational and dipolar relaxation in methyl groups." Invited talk, Physical Chemistry Colloquium, University of Pennsylvania, Philadelphia, Pennsylvania, USA.
15. April 1981 "Deuterium relaxation in liquid crystals." Contributed poster, Fifth International Meeting on NMR Spectroscopy, Exeter, UK (prize for best poster).

14. March 1981 "Electron spin relaxation and the quantum mechanical tunnelling of methyl groups at low temperatures." Invited talk, Chemical Physics Seminar, University of Southampton, Southampton, UK.
13. January 1981 "NMR and tunnelling methyl groups at low temperatures." Invited talk, Condensed Matter Seminar, Physics Department, Free University of Berlin, West Berlin, Federal Republic of Germany.
12. April 1980 "Reorientation and phase transitions in carborane: An isomer effect." Contributed poster, Twenty First Experimental Nuclear Magnetic Resonance Conference, Tallahassee, Florida, USA.
11. December 1978 "Electron spin relaxation and the quantum mechanical tunnelling of methyl groups at low temperatures." Invited colloquium, Physics Department, Swarthmore College, Swarthmore, Pennsylvania, USA.
10. October 1978 "The molecular pinball machine: the coupling of rotational and dipolar energy reservoirs." Colloquium, Department of Physics, Bryn Mawr College, Bryn Mawr, Pennsylvania, USA.
9. April 1977 "Electron spin relaxation and the quantum mechanical tunnelling of methyl groups at low temperatures." Invited colloquium, Physics Department, Bryn Mawr College, Bryn Mawr, Pennsylvania, 19010, USA.
8. April 1977 "Electron spin relaxation and the quantum mechanical tunnelling of methyl groups at low temperatures." Invited colloquium, Physics Department, Dartmouth College, Hanover, New Hampshire, USA.
7. April 1977 "Electron spin relaxation and tunnelling methyl groups." Contributed talk, VI International Symposium on Magnetic Resonance, Banff, Alberta, Canada.
6. May 1976 "Electron spin resonance and tunnelling methyl groups." Contributed talk, British Radio Spectroscopy Group, Oxford, UK.
5. February 1976 "Nuclear spin relaxation in dilute hydrogen and methane gas." Invited colloquium, Physics Department, University of Nottingham, Nottingham, UK.
4. May 1975 "Proton spin relaxation spectroscopy." Contributed talk, British Radio Spectroscopy Group, Durham, UK.
3. November 1974 "Gas phase nuclear spin relaxation." Contributed talk, NMR Group Meeting, Physics Department, University of British Columbia, Vancouver, British Columbia, Canada.
2. May 1974 "Centrifugal distortion effects in proton spin relaxation measurements in dilute methane gas." Contributed talk, Canadian Association of Physicists General Meeting, St. John's, Newfoundland, Canada.
1. May 1972 "Nuclear magnetic resonance in methane gas at low densities." Contributed talk, Division of Atomic and Molecular Physics of the Canadian Association of Physicists, Vancouver, British Columbia, Canada.

Meetings Attended

Administrative meetings, such as various NSF panels, are a part of "national service" and are not included in this list. This list refers solely to research. Beginning in the mid 2000's I began to attend many fewer meetings. The internet and email makes many collaborations possible without the need of spending much time at meetings (and at airports). The time is better spent in my lab doing my research.

52. Solid-State NMR Spectroscopy of Metals in Biological Systems and Materials, Newark, Delaware, Pennsylvania, June 2007.
51. Southeast Pennsylvania American Association of Physics Teachers Spring Meeting, Swarthmore, Pennsylvania, April 2007.
50. 48th Rocky Mountain Conference on Analytical Chemistry, Denver, Colorado, USA, July 2006.
49. 47th Rocky Mountain Conference on Analytical Chemistry, Denver, Colorado, USA, July 2005.
48. Gordon Conference on Magnetic Resonance, New London, Connecticut, USA, June 2005.
47. Gordon Conference on Magnetic Resonance, Bristol, Rhode Island, USA, June 2001.
46. Gordon Conference on Magnetic Resonance, Henniker, New Hampshire, USA, June 1999.
45. Canadian Association of Physicists Annual Meeting, Waterloo, Ontario, Canada, June 1998.
44. American Association of Physics Teachers Northeast Regional Conference, Brookhaven National Laboratories, Upton, New York, USA, October 1996.
43. Gordon Conference on Order / Disorder in Solids, New London, New Hampshire, USA, July 1996.
42. Blue Hen NMR Symposium, Department of Chemistry and Biochemistry, University of Delaware, Newark, Delaware, USA, June 1996.
41. Symposium on Liquid Crystals, Colloids, and Emulsions, Laboratory for Research on the Structure of Matter, University of Pennsylvania, Philadelphia, Pennsylvania, USA, May 1996.
40. Topical Conference of Departmental Chairs in Physics, Washington DC, USA, May 1995.
39. Gordon Conference on Order / Disorder in Solids, New London, New Hampshire, USA, Aug 1994.
38. A Symposium on Nuclear Magnetic Resonance; the Past, the Present and the Future. A Symposium to Honour Myer Bloom on the Occasion of His Retirement. Whistler Mountain, British Columbia, Canada, Dec 1993.
37. Eleventh Army Conference on Applied Mathematics and Computing, Pittsburgh, USA, June 1993.
36. Joint Meeting of the American Physical Society and the American Association of Physics Teachers, Washington DC, USA, April 1993.

35. International Symposium on the Physics and Chemistry of Finite Systems: From Clusters to Crystals, Richmond, Virginia, Oct 1991.
34. Blue Hen NMR Symposium, University of Delaware, Newark, Delaware, USA, June 1991.
33. 29th Eastern Analytical Symposium, Somerset, New Jersey, USA, Nov 1990.
32. Joint Meeting of the American Physical Society and the American Association of Physics Teachers, Atlanta, Georgia, USA, Jan 1990.
31. National Science Foundation Instrumentation and Laboratory Implementation Program Advisory Panel, Washington DC, USA, Jan 1989.
30. American Physical Society Annual Fall Meeting, Baltimore, Maryland, USA, April 1988.
29. Topical Conference of Departmental Chairs in Physics, Washington DC, USA, Feb 1988. (Member of Steering Committee and Session Chairman).
28. Montgomery County Science Teachers Mini-Convention, Mt St Joseph Academy, Flourtown, Pennsylvania, USA, Oct 1987.
27. Twenty Sixth Eastern Analytical Symposium, New York, USA, Sept 1987.
26. Twenty Sixth Experimental Nuclear Magnetic Resonance Conference, Baltimore, Maryland, USA, 1986.
25. Federation of Analytical Chemistry and Spectroscopy Societies Conference, Philadelphia, Pennsylvania, USA, 1985.
24. Waterloo Summer School on Nuclear Magnetic Resonance, Waterloo, Ontario, Canada, June 1985.
23. Twenty Fifth Experimental Nuclear Magnetic Resonance Conference, Asilomar, California, USA, 1985.
22. Puget Sound Division of the American Chemical Society: Linus Pauling Award to John Waugh, Seattle, Washington, USA, 1985.
21. NATO Advanced Study Institute: Nuclear Magnetic Resonance of Liquid Crystals, San Miniato, Italy, 1983.
20. Gordon Conference on Magnetic Resonance, Wolfeboro, New Hampshire, USA, June 1983.
19. Twenty Second Experimental Nuclear Magnetic Resonance Conference, Madison, Wisconsin, USA, 1982.
18. Fifth International Meeting on Nuclear Magnetic Resonance Spectroscopy, Exeter, England, 1981.
17. British Nuclear Magnetic Resonance Discussion Group: Two Dimensional Nuclear Magnetic Resonance and Chemically Induced Dynamic Nuclear Polarization, London, England, 1980.
16. Collaborative Computing Project No. 5: Intermolecular Potentials in Simulations, Oxford, England, 1980.
15. Conference on the Physics of Dielectrics, Canterbury, England, 1980.

14. Royal Society: Nuclear Magnetic Resonance Spectroscopy in Solids, London, England, 1980.
13. Twenty First Experimental Nuclear Magnetic Resonance Conference, Tallahassee, Florida, USA, 1980.
12. Gordon Conference on Magnetic Resonance, Wolfeboro, New Hampshire, USA, June 1979.
11. VI International Symposium on Magnetic Resonance, Banff, Alberta, Canada, May 1977.
10. British Radio Spectroscopy Group, Oxford, England, 1976.
9. XIX Colloque Ampere Congress, Heidelberg, Federal Republic of Germany, 1976.
8. British Radio Spectroscopy Group, Bristol, England, 1975.
7. British Radio Spectroscopy Group, Durham, England, 1975.
6. Conference in Commemoration of Herzberg's receiving the Nobel Prize, near Montreal, Province of Quebec, Canada, 1974.
5. Canadian Association of Physicists General Meeting, St John's, Newfoundland, Canada, 1974.
4. Waterloo Summer School on Nuclear Magnetic Resonance, Waterloo, Ontario, Canada, June 1973.
3. Gordon Conference on Magnetic Resonance, Meridan, New Hampshire, USA, June 1973.
2. Division of Atomic and Molecular Physics of the Canadian Association of Physicists, Vancouver, British Columbia, Canada, 1972.
1. Waterloo Summer School on Nuclear Magnetic Resonance, Waterloo, Ontario, Canada, June 1971.

Student Projects at Bryn Mawr College

A. PhD Theses

3. Xianlong Wang (PhD 2006) Joint with Frank Mallory and Michelle Francl in the Chemistry Department. "Ab initio electronic structure calculations in a series of organic compounds with methyl and *t*-butyl groups for both isolated molecules and solid state clusters." (Graduate Student 2003-06). Currently a professor at the School of Life Science and Technology, the University of Electronic Science and Technology of China, 4 N Jianshe Rd, Sect 2, Chengdu 610054, China.
2. Chris Palmer (PhD 1991) Joint with Alfonso Albano in the Physics Department. "A theoretical study of spin-lattice relaxation in molecular solids." (Graduate student, 1987-91). Staff Senior Physicist with Milton Roy Company, Rochester, NY.
1. Kathleen Conn (PhD 1986) "Investigation of methyl reorientation in solid state methylated phenanthrenes using pulsed proton magnetic resonance." (Graduate student, 1982-86 after having raised five children). Taught high school for a while and won many prestigious teaching awards and started innovative science programs, then did a JD and an LLM at Widener University, and is now an Assistant Professor of Education at Neumann College in Aston, Pennsylvania.

B. MA Theses

6. Donald Fahey (MA '09) "Solid state nuclear magnetic resonance and methyl group rotation in 4,4'-dimethoxyoctafluorobiphenyl" (BMC graduate student since 2006). Currently doing a PhD with Michael Noel in the Physics Department at Bryn Mawr College.
5. Laura Happersett (MA '90) "Proton spin-lattice relaxation in ethylbenzenes" (BMC graduate student, 1987-90).
4. Hong Yu (MA '87) "A study of proton zeeman relaxation and the two phases of 1,3-di-*t*-butylbenzene" (BMC graduate student, 1985-87).
3. Kathleen Gullifer (MA '86) "Methyl and *t*-butyl reorientation in 3-*t*-butylchrysene" (BMC graduate student, 1984-86). Works for a private defense contractor.
2. Mary Scott (MA '86) "Nuclear magnetic resonance and spin-lattice relaxation in organic molecular solids" (Raised five children then BMC graduate student: 1981-83, 1985-86). Laboratory Coordinator in the Physics Department, Bryn Mawr College 1986-1999. Retired.
1. Cheryl Mills (MA '80) "Proton spin-lattice relaxation and molecular dynamics in 4,4'-methylenebis(di-*t*-butylhydroxybenzene)" (BMC graduate student, 1978-80). Went into the ministry.

C. Undergraduate Theses and Projects

The numbers in braces { . . } count individual students.

57. Evan Schneider ('10) "Solid State Nuclear Magnetic Resonance Relaxation and Methyl Group Rotation in 4,4'-dimethoxybiphenyl" (Supervised Unit of Research 2009-10). {46} Currently a graduate student in Astronomy at the University of Arizona. Evan won the Gertrude Slaughter Fellowship, the second most prestigious honor in the graduating senior class.
56. Laura Popa ('09) "Proton spin relaxation in 5-*t*-butyl-4-hydroxy-2-methylphenyl sulfide; *t*-butyl and methyl group rotation in the solid state" (Summer 2008 research). {45} Currently a graduate student in Physics at the Massachusetts Institute of Technology. Laura won the Gertrude Slaughter Fellowship, the second most prestigious honor in the graduating senior class.
55. Candacia Greeman ('08) "The relationship between the proton spin relaxation rate and the molecular and crystal structure in *t*-butylcalix[4]arene" (Supervised Unit of Research, 2007-2008). {44} Currently a graduate student in biophysics at the Scripps Institute in La Jolla, California.
54. Jessie Rosenberg ('04) "A nuclear magnetic resonance study of 3-CF₃ phenanthrene" (Supervised Unit of Research, 2003-2004). {43} Did a PhD in Applied Physics, California Institute of Technology, Currently a Postdoctoral Fellow at Caltech.
53. Kerstin Nordstrom ('04) "A solid state nuclear magnetic resonance relaxation study of 1,3-dimethoxy-4-*t*-butylcalix[4]arene" (Supervised Unit of Research, 2003-3004). {42} Currently a graduate student in Physics, University of Pennsylvania.

52. Elizabeth Allocco ('02) "Nuclear magnetic relaxation in 2-*t*-butyl-4-methylhydroxybenzene: Relaxation measurements and data analysis" (Supervised Unit of Research, 2001-2002). {41}
51. Carolyn Kuranz ('02) "Nuclear magnetic relaxation in 2-*t*-butyl-4-methylhydroxybenzene: Relaxation measurements and experimental methods" (Supervised Unit of Research, 2001-02). {40} Did a PhD (09') in Applied Physics at the University of Michigan; currently a n Assistant Research Scientist at the Center for Relative Shock Hydrodynamics at the University of Michigan.
50. Maria Herd ('02) "Nuclear magnetic resonance of 1-CF₃-phenanthrene and 3-CF₃-phenanthrene: A preliminary study of nuclear spin relaxation in asymmetric molecules with two different spin-½ nuclei" (Supervised Unit of Research, 2001-02). {39} Did a PhD ('08) in Physics at the University of Wisconsin in Madison; currently an Assistant Professor of Physics at Earlham College.
49. Carol Paty ('01) A 8.50 MHz nuclear magnetic resonance relaxometry study of 2-*t*-butyl-4-methylhydroxybenzene" (Supervised Unit of Research, 2000-01). {38} Did a PhD in Space Sciences at the University of Washington, Seattle. Currently an Assistant Professor of Earth & Atmospheric Sciences at Georgia Tech.
48. Kendra Burbank ('00) "Zeeman relaxation in a series of related organic molecular solids" (Supervised Unit of Research, 1999-2000). {37} Worked at the University of Pisa, Italy 2000-01, then did a PhD in Theoretical Physics at Harvard University. Currently a Post-doctoral Fellow in the Department of Systems Biology, Harvard School of Medicine.
47. Kendra Burbank ('00) "Zeeman relaxation in 2-*t*-butylanthracene" (Supervised Unit of Research, 1998-99). {37} See #48.
46. Erin Slonaker ('99) "A study of the effects of thermal history on the proton spin-lattice relaxation rate in two organic molecular solids" (Supervised Unit of Research, 1998-99). {36} Working for Quirk Productions, a book publisher in Philadelphia and is the co-author of "The Worst-Case Scenario Survival Handbook" which has been featured on the Today Show and 20/20. Author of a children's book, "The Vampire Hunter's Handbook."
45. Jessica Ree ('99) "Zeeman relaxation in 2-ethylanthracene" (Supervised Unit of Research, 1998-99). {35} Software development for RiskMetrics Inc in New York.
44. Matty Lau ('97) "Proton spin-lattice relaxation in 2-*t*-butylanthraquinone" (Supervised Unit of Research, 1996-97). {34} Was (is?) a graduate student in the College of Education, Science Teaching Center, University of Maryland.
43. Tracy Weber ('97) "Proton spin-lattice relaxation in 2-ethylanthraquinone" (Supervised Unit of Research, 1996-97). {33} Was (is?) a lab technician at Mount Sinai Hospital in New York and a part-time graduate student in Health Policy at Columbia University.
42. Jennifer Mosher ('96) "The analysis of nuclear spin relaxation rate data using the software program Kaleidagraph" (Supervised Unit of Research, 1995-96). {32} Worked for a year at NIST, started graduate work in Physics at the University of

North Carolina, then transferred to the Physics Department at the University of Pennsylvania.

41. Katharine Martin Clemo ('96) "Methyl and *t*-butyl rotation in 2,6-di-*t*-butylnaphthalene: nuclear spin relaxation experiments and the use of the software program Origin for data analysis" (Supervised Unit of Research, 1995-96). {29} Had several interesting jobs in the western USA, went to law school and passed the Oregon State Bar Exams in 2006. Currently a lawyer in Portland, Oregon.
40. Mon Thiri Myaing ('97) "Proton spin-lattice relaxation in 1,2,4-triethylbenzene and the effects of thermal history" (Summer 1995 Research). {31} Did a 2004 PhD in Physics at University of Michigan.
39. Lidija Sekaric ('97) "Proton spin-lattice relaxation in 1,3,5-triethylbenzene" (Summer 1995 Research). {30} Did a PhD in Applied Physics at Cornell. Currently a Research Staff Member in the Nanostructures and Exploratory Devices Group in Silicon Technology, IBM, Watson Research Center, Yorktown, NY.
38. Katharine Martin Clemo ('96) "Proton spin-lattice relaxation in 2,6-di-*t*-butylnaphthalene" (Summer 1995 Research). {29} See #41.
37. Hania Al-Hallaq ('94) "Nuclear spin relaxation in 1-methylpyrene" (Supervised Unit of Research, 1993-94). {24} PhD, medical physics, University of Chicago (2001). MD/PhD, University of Chicago. Currently a member of the faculty of the Department of Radiation & Cellular Oncology, the Medical School of the University of Chicago.
36. Tess Powers ('94) "A theoretical study of correlation functions for non-random processes" (Supervised Unit of Research, 1993-94). {28}
35. Linette Prawirodirjo ('93) "A theoretical calculation of the zeeman spin-lattice relaxation rate in a polycrystalline solid with methyl reorientation in a potential with both a 3-fold and a 6-fold component" (Supervised Unit of Research, co-supervised with Anthony Hughes of the Mathematics Department, 1992-93). {27} PhD in Earth Sciences, University of San Diego.
34. Stephanie Goellner ('92) "A theoretical study of the stretched exponential function" (Supervised Unit of Research, 1991-92). {26} MA in Physics, University of West Virginia. Currently teaches high school in Houston, Texas.
33. Jessica Weiss (Haverford '92) "Experimental investigation into types of intramolecular motion in a series of alkyl-substituted organic compounds" (Supervised Unit of Research, 1991-92). {23} PhD in Physical Chemistry, University of Chicago. Post-doctoral Fellowship in Food Science, University of California at San Diego. Currently a senior scientist at Nestle.
32. Jessica Weiss (Haverford '92) "Proton spin relaxation and structure and dynamics in 2-ethylnaphthalene" (Supervised Unit of Research, 1991-92). {23} See #33.
31. Brian Roe (Haverford '92) "Nuclear spin relaxation in 1,3-diisopropylbenzene; isopropyl structure and dynamics" (Supervised Unit of Research, 1991-92). {25} MA at Cornell University.

30. Hania Al-Hallaq ('94) "Isopropyl group geometry and methyl group dynamics in 1,2,4,5-tetraisopropylbenzene" (Summer 1991 Research). {24} See #37.
29. Jessica Weiss (Haverford '92) "Proton spin relaxation and thermal history effects in 1-ethylnaphthalene" (Summer 1991 Research). {23} See #33.
28. Anne Fry ('90) "Proton zeeman relaxation and models for *t*-butyl reorientation in 2,4,6-tri-*t*-butylbromobenzene" (Supervised Unit of Research, 1989-90). {21} PhD Physics, University of North Carolina 1997, post-doc in astronomy Case Western Reserve, then scientist in a digital photographic research lab in Minneapolis.
27. Amy Plofker (Haverford, '90) "Nuclear spin relaxation in isopropylbenzene" (Supervised Unit of Research, 1989-90). {22}
26. Anne Fry ('90) "Nuclear spin relaxation in a variety of organic molecular solids and the setting up of a new computer / oscilloscope data acquisition system" (Summer 1989 Research). {21} See #28.
25. Robin Hathorn ('88) "Proton Zeeman relaxation in *t*-butylbenzene; models for *t*-butyl reorientation in the solid state" (Supervised Unit of Research, 1987-88, supervised jointly with F B Mallory in the Chemistry Department). {20}
24. William Tong (Whitman '87) "Proton Zeeman relaxation in the three isomers of ethylbenzene" (Summer 1987 Research). {19}
23. Antonia Herzog (Vassar '87) "Nuclear spin relaxation of benzene in a clathrate" (Summer 1987 Research). {18} PhD in Physics, University of California, San Diego.
22. Audrey Hill ('88) "Proton zeeman relaxation in 1,3-di-*t*-butylbenzene at 8.5 and 53 MHz" (Summer 1986 Research). {17} MA in Linguistics, University of California at San Diego.
21. Ellen Kohler ('89) "A study of the relationship between the spin-lattice relaxation rate in, and the physical preparation of 1,3,5-tri-*t*-butylbenzene" (Summer 1987 Research). {16}
20. Stella Yong ('86) "Spin-lattice relaxation in 4,4'-methylenebis(di-*t*-butylhydroxybenzene)" (Supervised Unit of Research, 1985-86). {15} Investment banker in Chicago.
19. Jee-Sun Oh ('86) "Proton spin-lattice relaxation in 3-*t*-butylchrysene" (Supervised Unit of Research, 1985-86). {14}
18. Carolyn Buser ('86) "Synthesis, high resolution NMR and solid state proton spin-lattice relaxation in 3-*t*-butylchrysene" (Supervised Unit of Research, 1985-86; supervised jointly with F B Mallory in the Chemistry Department). {13} PhD in Chemistry, Yale University. Currently a scientist with Merck.
17. Emily Fisch ('85) "Spin-lattice relaxation in 2,4- and 2,5-di-*t*-butylhydroxybenzene and distributions of activation energies for methyl and *t*-butyl reorientation" (Supervised Unit of Research, 1983-84). {10} M.S. in Applied Science, Yale University (1987). PhD in Physics, Dartmouth College (1992). Research Scientist, IBM Microelectronics, Essex Junction, Vermont, USA.

16. Manjula Narasimhan ('85) "A preliminary dipolar relaxation study" (Supervised Unit of Research, 1983-84). {12} Ph.D. in chemistry, University of York, U.K. Scientific Director at Medabiotech S.A in Switzerland.
15. Ruth Herzog ('84) "A review of a pulsed NMR spectroscopy apparatus for measuring nuclear spin relaxation rates" (Supervised Unit of Research, 1983-84). {11} PhD in Electrical Engineering, Johns Hopkins University.
14. Emily Fisch ('85) "Spin-lattice relaxation in 2,4- and 2,5-di-*t*-butyl-hydroxybenzene" (Summer 1983 Research). {10} See #17.
13. Angela Cheung ('84) "An NMR study of methyl and isopropyl motion in organic molecular solids" (Supervised Unit of Research, 1983-84). {9} MD, Johns Hopkins (1988), PhD, Harvard (1997). Scientist of Clinical Studies Resource Centre, Division of Clinical Investigation and Human Physiology, Toronto General Research Institute, University of Toronto, Toronto, Ontario, Canada.
12. Florence Fusco ('83) "Nuclear spin relaxation and methyl and *t*-butyl group motion in organic molecular solids" (Supervised Unit of Research, 1982-83). {6} MSc in Engineering, Massachusetts Institute of Technology. Currently a patent lawyer.
11. Ann O'Neill ('83) "Spin-lattice relaxation in 1,4-di-*t*-butylbenzene" (Supervised Unit of Research, 1982-83). {8}
10. Margaret Carrington ('83) "A study of activation energy distributions for NMR relaxation experiments" (Supervised Unit of Research, 1982-83; supervised jointly with A M Albano). {7} PhD in theoretical physics, State University of New York, Stony Brook. Post-doc in Physics, University of Minnesota. Then an assistant professor, University of Winnipeg. Currently a professor of physics at Brandon University in Brandon, Winnipeg.
9. Florence Fusco ('83) "Development of automated data acquisition apparatus for solid state nuclear spin relaxation measurements" (Supervised Unit of Research, 1981-82). {6} See #12.
8. Swee Lian Tan ('82) "Nuclear spin relaxation and infrared spectroscopy in a series of di-*t*-butylhydroxybenzenes" (Supervised Unit of Research, 1979-80). {3} PhD in Physical Chemistry, MIT. MD, Harvard.
7. Becky Ross ('80) "Proton spin relaxation in 2,6-di-*t*-butylhydroxybenzene" (Supervised Unit of Research, 1979-80). {5} MS in Atmospheric Science, Notre Dame.
6. Meigan Aronson ('80) "Proton spin-lattice relaxation in 3,5-di-*t*-butylhydroxybenzene" (Supervised Unit of Research, 1979-80). {4} PhD in physics, University of Illinois, Champaign-Urbana. Professor of Physics, University of Michigan. Fellow, American Physical Society.
5. Swee Lian Tan ('82) "Nuclear spin relaxation in 4,4'-methylenebis(di-*t*-butylhydroxybenzene)" (Summer 1979 Research). {3} See #8.
4. Meigan Aronson ('80) "Data acquisition using a PET microcomputer" (Summer 1979 Research). {4} See #6.
3. Swee Lian Tan ('82) "Nuclear spin relaxation in 4,4'-methylenebis(di-*t*-butylhydroxybenzene)" (Supervised Unit of Research, 1978-79). {3} See #8.

2. Vicki Guerra ('79) "The effect of the hydroxy proton on the spin-lattice relaxation rate in 4,4'-methylenebis(di-*t*-butylhydroxybenzene)" (Supervised Unit of Research, 1978-79). {2} PhD in Material Science and Engineering, University of Pennsylvania. Senior Scientist, E. I. Dupont DeMours Company, Wilmington, Delaware.
1. Anne Wehrle ('78) "Nuclear spin relaxation in a single crystal of 4-methyl-2,6-di-*t*-butylhydroxybenzene" (Supervised Unit of Research, 1977-78). {1} PhD in astrophysics, University of California at Los Angeles. Post-doc, Jet Propulsion Laboratory, California Institute of Technology. Staff Astronomer at the California Institute of Technology. She was chosen as a member of the Science Team for the Space Interferometry Mission.

Bryn Mawr College:

College-Wide Committee Work and Physics Department Positions

The first number is my year at Bryn Mawr College. The number after each entry is the total number of years (or times) I have performed this function.

35. 2011-2012 Chairman, Physics Department 12
College Freshman Adviser 4
Committee on Academic Standing 3
Science Chairs Committee 12
34. 2010-2011 Chairman, Physics Department 11
Committee on Laboratories, Chair 17
Chair, Physics Tenure Track Search Committee (Battat) 18
Board of Trustees Sub-committee on the Competitive Position of the College 2
College Freshman Adviser 3
Committee on Academic Standing 2
Science Chairs Committee 11
33. 2009-2010 On Leave Semester II
Physics Undergraduate Adviser - all years 18
Engineering Programs Coordinator 16
College Freshman Adviser 2
Committee on Laboratories, Chair (starting semester two) 16
Search Committee for the Dean of Admissions 1
Board of Trustees Sub-committee on the Competitive Position of the College 1
Committee on Academic Standing (from April 2010) 1
32. 2008-2009 Physics Undergraduate Adviser - all years 17
Physics Tenure Track Search Committee (Cheng) 17
3-2 Engineering Plans Coordinator 15
College Freshman Adviser 1
31. 2007-2008 On leave Semester I
Majors Adviser to the Physics Classes of 2010 and 2011 16

- Academic Honor Board 4
30. 2006-2007 Chairman, Physics Department 10
 Science Chairs Committee 10
 Committee on Libraries, Information Services, and Computing 3
 Chair, Physics Tenure Track Search Committee (Schulz) 16
 Majors Adviser to the Physics Class of 2007 15
 Academic Honor Board 3
 Chair, Laboratory Committee 15
 Chair, Nominations Committee of the General Faculty 8
 Chair, Nominations Committee of the Faculty of Arts and Sciences 8
29. 2005-2006 Chairman, Physics Department 9
 Science Chairs Committee 9
 Committee on Libraries, Information Services, and Computing 2
 Majors Adviser to the Physics Classes of 2006 and 2007 14
 Academic Honor Board 2
 Chair, Laboratory Committee 14
 Chair, Nominations Committee of the General Faculty 7
 Chair, Nominations Committee of the Faculty of Arts and Sciences 7
 Physics non tenure-track search (Nadina Gheorghiu) 18
28. 2004-2005 Co-chair, Laboratory Committee 13
 Science Computing Node Representative for Physics 1 (of 1!)
 Science Computing Node Representative for Computer Science 1 (of 1!)
 Committee on Libraries, Information Services, and Computing 1
 Chair, Physics Tenure Track Search Committee (failed) 14
 Chemistry Tenure Track Search Committee (Goldsmith) 15
 Majors Adviser to the Physics Class of 2006 13
 Academic Honor Board (Unofficial Alternative) 1
 Nominations Committee of the General Faculty 6
 Nominations Committee of the Faculty of Arts and Sciences 6
 Physics non tenure-track search (Christian Bracher) 16
 Physics non tenure-track search (David Nice) 17
27. 2003-2004 On Leave Semester I. Semester II
 Committee for Undergraduate Admissions 9
 Laboratory Committee 12
 Majors Adviser to the Physics Class of 2006 12
 Physics non tenure-track search (Tsvetelin Tsankov) 15
26. 2002-2003 Convener, Committee for Undergraduate Admissions 8
 President's *ad hoc* Enrollment Management Advisory Group 1 (of 1!)
 Laboratory Committee 11
25. 2001-2002 Chairman, Physics Department 8
 Committee for the Coordination of the Sciences 8
 Library Committee 3

- Convener, Committee for Undergraduate Admissions 7
3-2 Engineering Plans Coordinator 14
24. 2000-2001 Chairman, Physics Department 7
Committee for the Coordination of the Sciences 7
Committee on the Review of Termination of Tenure (did not meet) 11
Library Committee 2
3-2 Engineering Plans Coordinator 13
Majors Adviser for the class of 2001 11
23. 1999-2000 Chairman, Physics Department 6
Committee for the Coordination of the Sciences 6
Committee on the Review of Termination of Tenure (did not meet) 10
Physics Tenure Track Search Committee (Michael Noel) 12
Chemistry Tenure Track Search Committee (Ed Wochvko) 13
Library Committee 1
3-2 Engineering Plans Coordinator 12
Majors Adviser for the classes of 2000 and 2001 10
Physics non tenure-track search (Mathew Rice) 12
Physics non tenure-track search (Tony Rothman) 13
Physics non tenure-track search (Sunme Kim) 14
22. 1998-99 Laboratory Committee 10
Committee on the Review of Termination of Tenure (did not meet) 9
3-2 Engineering Plans Coordinator 11
Committee on Undergraduate Awards and Fellowships 1
Majors Adviser - all years 9
Graduate Adviser 8
21. 1997-98 Nothing! (Enhanced Sabbatical Leave) 11
20. 1996-97 Committee on Review of Termination of Tenure (did not meet) 8
Graduate Adviser 7
Physics non tenure-track search (Alan Tameshtit) 11
19. 1995-96 Chairman, Physics Department 5
Committee for the Coordination of the Sciences 5
Committee on the Review of Termination of Tenure (did not meet) 7
Graduate Adviser 6
18. 1994-95 Chairman, Physics Department 4
Committee for the Coordination of the Sciences 4
Undergraduate Admissions Committee 6
Laboratory Committee 9
Committee on the Review of Termination of Tenure (did not meet) 6
3-2 Engineering Plans Coordinator 10
Majors Adviser - all years 8
Graduate Adviser 5

- Physics Tenure-track Search Committee (Elizabeth McCormack) 11
Physics non tenure-track search (Chuck Samuels) 10
17. 1993-94 Chairman, Physics Department 3
Committee for the Coordination of the Sciences 3
Undergraduate Admissions Committee 5
Laboratory Committee 8
Committee on the Review of Termination of Tenure (did not meet) 5
3-2 Engineering Plans Coordinator 9
Majors Adviser - all years 7
Graduate Adviser 4
Physics non tenure-track search (Tina Mello) 8
Physics non tenure-track search (Jim Arrison) 9
16. 1992-93 Undergraduate Admissions Committee 4
Laboratory Committee (semester 2) 7
Committee on the Review of Termination of Tenure (did not meet) 4
Majors Adviser - all years 6
3-2 Engineering Plans Coordinator 8
Graduate Adviser 3
15. 1991-92 Undergraduate Curriculum Committee 3
Committee on the Review of Termination of Tenure (did not meet) 3
Majors Adviser - all years 5
3-2 Engineering Plans Coordinator 7
Physics non tenure-track search (Aurora Vicens) 7
14. 1990-91 (on leave semester 2)
Chairman, Committee on Nominations of the General Faculty 5
Chairman, Committee on Nominations of the Faculty of Arts & Sciences 5
Laboratory Committee (semester 1) 6
Committee on the Review of Termination of Tenure (did not meet) 2
Undergraduate Curriculum Committee (semester 1) 2
13. 1989-90 Laboratory Committee 5
Chairman, Committee on Nominations of the General Faculty 4
Chairman, Committee on Nominations of the Faculty of Arts & Sciences 4
Committee on the Review of Termination of Tenure (did not meet) 1
Undergraduate Curriculum Committee 1
Fringe Benefits Committee (semester 2 substitute) 1
Chairman: Physics Tenure-track Search Committee (Michelle Shinn) 10
Physics non tenure-track search (Greg Alman) 6
12. 1988-89 Chairman, Physics Department 2
Laboratory Committee 4
Committee for the Coordination of the Sciences 2
Chairman, Committee on Nominations of the General Faculty 3
Chairman, Committee on Nominations of the Faculty of Arts & Sciences 3

- 3-2 Engineering Plans Coordinator 6
- 11. 1987-88 Chairman, Physics Department 1
 - Laboratory Committee 3
 - Committee for the Coordination of the Sciences 1
 - Committee on Nominations of the General Faculty 2
 - Committee on Nominations of the Faculty of Arts & Sciences 2
 - Mathematics tenure-track search (Marvin Knopp) 9
 - 3-2 Engineering Plans Coordinator 5
 - Physics non tenure-track search (Dave Chyba) 5
- 10. 1986-87 Chair, Physics tenure-track search (terminated Nov) 8
 - Laboratory Committee 2
 - Committee on Nominations of the General Faculty 1
 - Committee on Nominations of the Faculty of Arts & Sciences 1
 - Majors Adviser - all years 4
 - 3-2 Engineering Plans Coordinator 4
- 9. 1985-86 Chair, Physics tenure-track search (no appointment) 7
 - Majors Adviser - all years 3
 - 3-2 Engineering Plans Coordinator 3
- 8. 1984-85 (sabbatical leave, Vancouver, British Columbia)
- 7. 1983-84 Undergraduate Admissions Committee 3
 - Geology tenure-track search (Bobbi Castens-Seidell) 5
 - Haverford Physics tenure-track search (David Pine) 6
 - Laboratory Committee 1
 - 3-2 Engineering Plans Coordinator (semester I) 2
 - Majors Adviser - all years 2
 - Graduate Adviser 2
- 6. 1982-83 Undergraduate Admissions Committee 2
 - Physics non tenure-track search (Teymour Darkhosh) 3
 - Physics non tenure-track search (Roberta Young) 4
 - 3-2 Engineering Plans Coordinator 1
 - Majors Adviser - all years 1
 - Graduate Adviser 1
- 5. 1981-82 Undergraduate Admissions Committee 1
 - Physics non tenure-track search (Steve Brierley) 2
- 4. 1980-81 (junior faculty leave, Southampton, England)
- 3. 1979-80 Madge Miller Grant Committee leave replacement 1 (of 1!)
 - Physics tenure-track search (Neal Abraham) 3
 - Chemistry tenure-track search (Geri Richmond) 4

2. 1978-79 Mathematics tenure-track search (Rhonda Hughes) 1
 Mathematics tenure-track search (Mario Martelli) 2
 Physics non tenure-track search (Beth Shimer) 1
1. 1977-78 nothing that I wrote down and can remember!

Courses Taught at Bryn Mawr College

100-level courses are at the introductory level, 200-level courses are for second-year students, 300-level courses are for third & fourth-year students, 400-level courses are undergraduate student research, 500-level courses are first-year graduate-level courses, and 600-level courses are advanced graduate seminars. I am using course number 700 for graduate research units during the academic year. Summer undergraduate and graduate research supervision is not listed here since they are not formal courses.

The number in parentheses following the year is my year at Bryn Mawr College. The first three-digit number for each entry is the Bryn Mawr College course number and the second number is the number of students at midterm. The author(s) of the text book(s) is indicated in parentheses where appropriate. All laboratory courses are listed separately with an L, even if they are part of a lecture course.

The last number is the number of times I have taught the course (or a similar course that it replaced).

2011-2012 semester one (35)

121	40	modeling the physical world (many web sites and my notes)	32
100L	20	one two-hour lab session	16
col sem	12	freshman writing seminar (many texts)	6

2010-2011 semester one (34)

121	31	modeling the physical world (many web sites and my notes)	31
100L	95+	over two afternoons a week	15
403	1	undergraduate research	42

2010-2011 semester two

214	16	introductory quantum mechanics (Townsend)	12
322	6	solid state physics (Kittel)	8

2009-2010 semester one (33)

101-1	75	introductory physics for postbaccalaureates (Knight, Jones, & Field)	
403	1	undergraduate research	40

2009-2010 semester two sabbatical leave

403	1	undergraduate research	41
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2008-2009 semester one (32)

121	39	modeling the physical world (many web sites and texts)	30
303	5	statistical & thermal physics (Reif)	8
100L	70	over two afternoons a week	14

2008-2009 semester two

107/150	82	conceptual physics (many web sites; Lederman & Hill; "Symmetry")	4
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322	5	solid state physics (Kittel) 7
<i>2007-2008 semester one (31) sabbatical leave</i>		
403	1	undergraduate research 38
<i>2007-2008 semester two</i>		
102	41	introductory physics (Knight, Jones, and Field) 29
214L	6	quantum mechanics, solid state physics, & optics second-year lab 9
302	5	advanced quantum mechanics (Griffiths) 7
403	1	undergraduate research 39
<i>2006-2007 semester one (30)</i>		
303	16	statistical & thermal physics (Reif) 7
<i>2006-2007 semester two</i>		
107/150	48	conceptual physics (various readings and web sites) 3
100L	24	introductory physics laboratory, one afternoon 13
322	4	solid state physics (Kittel) 6
<i>2005-2006 semester one (29)</i>		
214	15	classical and quantum mechanics (Rohlf, Fowles & Cassiday) 11
<i>2005-2006 semester two</i>		
104	16	introductory physics (Tipler and Mosca) 28
302	10	quantum mechanics (Griffiths, 2nd edition) 6
<i>2004-2005 semester one (28)</i>		
100L	128	over four afternoons 11
<i>2004-2005 semester two</i>		
100L	155	over five afternoons 12
<i>2003-2004 semester one (27) sabbatical leave (60% at Bryn Mawr, 40% at Delaware)</i>		
403	2	undergraduate research 36
<i>2003-2004 semester two</i>		
104	18	introductory physics (Tipler and Mosca) 27
215	5	special rel, e&m, and particles (Rohlf, Good, and Fowles & Cassiday) 10
215L	5	electronics laboratory 8
403	2	undergraduate research 37
<i>2002-2003 semester one (26)</i>		
103	16	introductory physics (Tipler) 26
303	10	statistical & thermal physics (Reif) 6
<i>2002-2003 semester two</i>		
215	4	special relativity, electromagnetism, and particles (Rohlf and Good) 9
215L	4	electronics laboratory 7
322	6	solid state physics (Kittel) 5
<i>2001-2002 semester one (25) [chairman]</i>		
103	15	introductory physics (Tipler: see 1982-83!) 25
214L	8	quantum mechanics, solid state physics, & optics second-year lab 8
col sem	15	freshman college seminar (many texts) 5

403 3 undergraduate research 34
 2001-2002 semester two [chairman]
 215 6 special relativity, electromagnetism, and particles (Rohlf and Good) 8
 390 1 solid state physics (= physics 322) (Kittel) 4B
 403 3 undergraduate research 35

2000-2001 semester one (24) [chairman]

101 35 introductory physics {third third of semester} (Giancoli) 23
 103 39 introductory physics (Giancoli) 24
 col sem 16 freshman college seminar (many texts) 4
 403 1 undergraduate research 32
 700 2 graduate research 22

2000-2001 semester two [chairman]

322 6 solid state physics (Kittel) 4A
 403 1 undergraduate research 33

1999-2000 semester one (23) [chairman]

214L 8 quantum mechanics, solid state physics, & optics second-year lab 7
 403 1 undergraduate research 31

1999-2000 semester two [chairman]

331L 6 modern physics laboratory 9

1998-1999 semester one (22)

214L 22 quantum mechanics, solid state physics, & optics second-year lab 6
 403 3 undergraduate research 29

1998-1999 semester two

331L 14 modern physics laboratory 8
 403 3 undergraduate research 30

1997-1998 semester one (21) (enhanced sabbatical leave)

lib stu 72 college seminar (many texts, responsible for 18 students)
 (with Paul Grobstein, Sandra Berwind and Gail Hemmeter) 3

1997-1998 semester two (enhanced sabbatical leave)

1996-1997 semester one (20)

lib stu 47 liberal studies (many texts, responsible for 15 students)
 (with Paul Grobstein and Sandra Berwind) 1

101 65 introductory physics (Serway) 22
 403 2 undergraduate research 27

1996-1997 semester two

lib stu 47 liberal studies (many texts, responsible for 14 students)
 (with Paul Grobstein and Sandra Berwind) 2

214 9 modern physics (Rohlf) 7
 403 2 undergraduate research 28

1995-1996 semester one (19) [chairman]

331L 11 modern physics laboratory 7
 403 2 undergraduate research 25

1995-1996 semester two [chairman]

214	18	modern physics (Rohlf) 6
214L	18	quantum mechanics, solid state physics, & optics second-year lab 5
403	4	undergraduate research 26

1994-1995 semester one (18) [chairman]

331L	5	modern physics laboratory 6
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1994-1995 semester two [chairman]

309	14	electromagnetic theory (Reitz, Christy & Milford) 3
214L	14	quantum mechanics, solid state physics, & optics second-year lab 4

1993-1994 semester one (17) [chairman]

101	35	introductory physics I (Serway) 20
403	2	undergraduate research 23

1993-1994 semester two [chairman]

122	22	mech, thermo & waves (Halliday, Resnick & Walker) 21
507	2	graduate statistical mechanics (Reichl) 1
403	2	undergraduate research 24

1992-1993 semester one (16)

100	198	introductory physics lab lecture, 10 groups of 20, one group per day in two-week cycles (a one-time experiment)
501	4	graduate quantum mechanics (Cohen-Tannoudji et al) 3
403	1	undergraduate research 21

1992-1993 semester two

122	24	introductory Newtonian and relativistic mechanics (French: classical mechanics; Resnick & Halliday: spec relativity) 18
502	4	graduate quantum mechanics (Cohen-Tannoudji et al) 4
403	1	undergraduate research 22

Summer 1993

102	13	introductory physics II (Serway) 19
100L	13	introductory physics lab 10

1991-1992 semester one (15)

107	61	conceptual physics (Pasachoff & Kutner, Hawking, Penrose) 2
100L	61	introductory physics lab 7
403	3	undergraduate research 19

1991-1992 semester two

102	99	introductory physics II (Serway) 15
302	24	quantum mechanics (Liboff) 5
403	4	undergraduate research 20

Summer 1992

101	17	introductory physics I (Serway) 16
100L	17	introductory physics lab 8
102	15	introductory physics II (Serway) 17
100L	15	introductory physics lab 9

1990-1991 semester one (14)

150 48 conceptual physics (Dixon, Hawking, ...) 1
 700 1 graduate research 20

1990-1991 semester two sabbatical leave

700 1 graduate research 19

1989-1990 semester one (13)

103 45 introductory physics I (Serway) 12
 331L 8 modern physics laboratory (Melissinos) 5
 403 2 undergraduate research 17
 700 2 graduate research 18

1989-1990 semester two

305L 6 advanced electronics lab (Higgins) 4
 403 2 undergraduate research 18
 700 2 graduate research 19

Summer 1990

101 13 introductory physics I (Serway) 13
 100L 13 introductory physics lab 5
 102 11 introductory physics II (Serway) 14
 100L 11 introductory physics lab 6

1988-1989 semester one (12) [chairman]

303 11 statistical & thermal physics (Reif) 5
 331L 9 modern physics laboratory (Melissinos) 4
 700 2 graduate research 16

1988-1989 semester two [chairman]

102 25 introductory physics II (Serway) 9
 307 4 solid state physics (Kittel) {henceforth numbered 322} 3
 700 2 graduate research 17

Summer 1989 [chairman]

101 17 introductory physics I (Serway) 10
 100L 17 introductory physics lab 3
 102 13 introductory physics II (Serway) 11
 100L 13 introductory physics lab 4

1987-1988 semester one (11) [chairman]

203 13 classical & relativistic mechanics (Fowles and Taylor & Wheeler) 5
 203L 13 electronics lab 6
 301 5 quantum mechanics I (French & Taylor) 4
 403 1 undergraduate research 15
 700 2 graduate research 14

1987-1988 semester two [chairman]

102 82 introductory physics II (Serway) 7
 305L 5 advanced electronics lab (Higgins) 3
 403 1 undergraduate research 15
 700 2 graduate research 15

Summer 1988 [chairman]

102	25	introductory physics II (Serway) 8
100L	25	introductory physics lab 2

1986-1987 semester one (10)

203	5	classical & relativistic mechanics (Fowles and Taylor & Wheeler) 4
203L	5	electronics lab 5
301	7	quantum mechanics (French & Taylor) 3
700	1	graduate research 12

1986-1987 semester two

102	71	introductory physics II (Serway) 6
700	1	graduate research 13

1985-1986 semester one (9)

203	5	classical & relativistic mechanics (Fowles and Taylor & Wheeler) 3
203L	5	electronics laboratory 4
301	13	quantum mechanics (French & Taylor) 2
303	5	statistical & thermal physics (Reif) 4
403	3	undergraduate research 13
700	3	graduate research 10

1985-1986 semester two

305L	8	advanced electronics lab (Higgins) 2
307	9	solid state physics (Kittel) 2
403	3	undergraduate research 14
700	4	graduate research 11

1984-1985 semester one (8) sabbatical leave

700	1	graduate research 8
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1984-1985 semester two (8) sabbatical leave

700	1	graduate research 9
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1983-1984 semester one (7)

303	13	statistical & thermal physics (Reif) 3
331L	6	modern physics lab (Melissinos) 3A
403	4	undergraduate research 11
700	1	graduate research 7

1983-1984 semester two

305L	7	advanced electronics lab (Higgins) 1
331L	6	modern physics lab (Melissinos) 3B
403	4	undergraduate research 12

1982-1983 semester one (6)

101	75	introductory physics I (Tipler) 4
201L	8	electronics laboratory 2
403	3	undergraduate research 9
700	1	graduate research 5

1982-1983 semester two

102	75	introductory physics I (1/3 semester) (Tipler) 5
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201L	9	electronics laboratory (1/2 semester) 3
331L	5	modern physics lab (Melissinos) 2
403	3	undergraduate research 10
700	1	graduate research 6

1981-1982 semester one (5)

309	4	electromagnetic theory (Reitz & Milford) 2
311	8	quantum mechanics (French & Taylor) 1
331L	8	modern phys lab (with Neal Abraham) (Melissinos) 1A
403	1	undergraduate research 7
501	1	quantum mechanics (Messiah) 2

1981-1982 semester two

102	41	introductory physics II (Orear) 3
211L	6	electronics laboratory 1
331L	9	modern phys lab (with Neal Abraham) (Melissinos) 1B
403	1	undergraduate research 8

*1980-1981 semesters one and two (4) junior faculty leave**1979-1980 semester one (3)*

101	100	introductory physics I (Michaels, Smith, Albano & Hoyt) 2
403	3	undergraduate research 5
700	1	graduate research 3

1979-1980 semester two

211	9	classical mechanics (Symon) 2
211L	9	quantum mechanics, solid state physics, & optics second-year lab 3
403	3	undergraduate research 6
607	3	solid state physics (Ziman) 1
700	1	graduate research 4

1978-1979 semester one (2)

101	128	introductory physics (Michaels, Smith, Albano & Hoyt) 1
100L	128	introductory physics lab over five afternoons 1
399	4	solid state physics (1/2 semester) (Kittel) {henceforth numbered 307} 1
403	2	undergraduate research 3
700	1	graduate research 1

1978-1979 semester two

303	8	statistical & thermal physics (Reif) 2
206	13	classical & quantum physics (French & Taylor and Symon) 1
206L	13	quantum mechanics, solid state physics, & optics second-year lab 2
403	2	undergraduate research 4
700	1	graduate research 2

1977-1978 semester one (1)

399	5 students	statistical & thermal physics (Reif) {henceforth numbered 303} 1
501	2	quantum mechanics (Messiah) 1
403	1	undergraduate research 1

1977-1978 semester two

- | | | |
|------|---|---|
| 307 | 3 | classical & quantum mechanics II (Symon and Eisberg & Resnick)
(1 of 1 - never to be repeated) |
| 307L | 3 | quantum mechanics, solid state physics, & optics lab 1
(I moved this lab to the sophomore level beginning 1978-79) |
| 309 | 3 | electromagnetic theory (Reitz & Milford) 1 |
| 399 | 4 | atomic, molecular & solid state physics (1/3 sem) (Eisberg & Resnick)
(1 of 1 - never to be repeated) |
| 403 | 1 | undergraduate research 2 |

THE END