Peter Adrian Beckmann

Marion Reilly Professor Emeritus of Physics
Department of Physics, Bryn Mawr College
Arrived 1 September 1977; Retired 31 August 2017
November 2019 Curriculum Vitae Update

Education at the University of British Columbia, Vancouver

1975 PhD Physics; 1971 MSc Physics; 1969 BSc Physics

Post-Doctoral Position in Nottingham, England

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

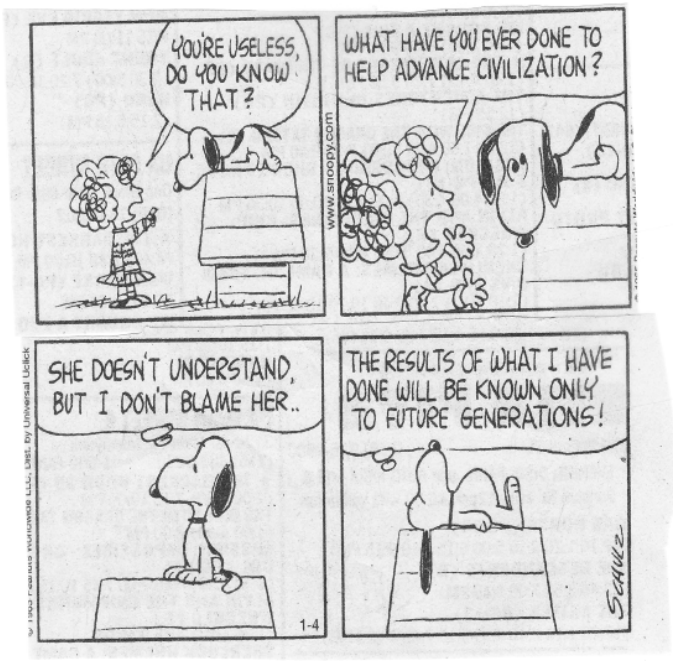
2010-2012, 2005-2007, 1999-2002, 1993-1996, 1987-1989 Chairman
2017 Marion Reilly Professor Emeritus of Physics
1987-2017 Professor; 2007-2017 Marion Reilly Professor of Physics
1982-87 Associate Professor, 1977-82 Assistant Professor

Research Position at the University of Delaware

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

Sabbaticals

2016 Fall (80%), 2017 Spring (20%); at Bryn Mawr College
2014 Spring; at Bryn Mawr College
2010 Spring; at Bryn Mawr College
2007 Fall; at Bryn Mawr College
2003 Fall; 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, University of Delaware, Newark, Delaware
1991 Spring; at Bryn Mawr College
1984-1985 full year in the Department of Chemistry, University of British Columbia, Vancouver, British Columbia, Canada
1980-1981 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.*

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83. Concomitant Polymorphism in an Organic Solid: Molecular and Crystal Structure and Intramolecular and Intermolecular Potential Contributions to *tert*-Butyl and Methyl Group Rotation. P A Beckmann, P R Rablen, J Schmink, S T Szewczyk, and A L Rheingold 2019 ChemPhysChem 20 2887-2894. <https://onlinelibrary.wiley.com/doi/10.1002/cphc.201900436>
82. Proton spin-lattice relaxation in methylphenanthrenes IV: 1,4-dimethylphenanthrene. P A Beckmann 2019 Journal of Chemical Physics 50 124508 1-3. <https://aip.scitation.org/doi/10.1063/1.5082925>
81. H-1 Spin-Lattice Relaxation in Organic Molecular Solids: Polymorphism and the Dependence on Sample Preparation, P A Beckmann, J Ford, W P Malachowski, A R McGhie, C E Moore, A L Rheingold, G J Sloan, and S T Szewczyk 2018 ChemPhysChem 19 2423-2436. <https://onlinelibrary.wiley.com/doi/full/10.1002/cphc.201800237>
80. Note: Methyl and *t*-butyl group rotation in van der Waals solids. P A Beckmann, A L Rheingold, and J Schmink 2018 Journal of Chemical Physics, 148, 106101, 1-2. <https://aip.scitation.org/doi/10.1063/1.5021328>

79. Solid-solid phase transitions and *t*-butyl and methyl group rotation in an organic solid: X-ray diffractometry, differential scanning calorimetry, and solid state H-1 nuclear spin relaxation. P A Beckmann, A R McGhie, A L Rheingold, G J Sloan, and S T Szewczyk 2017 Journal of Physical Chemistry A 121 6220-6230. <http://pubs.acs.org/doi/10.1021/acs.jpca.7b06265>
78. Monitoring a simple hydrolysis process in an organic solid by observing methyl group rotation. P A Beckmann, J M Bohen, J Ford, W P Malachowski, C W Mallory, F B Mallory, A R McGhie, A L Rheingold, G J Sloan, S T Szewczyk, X Wang, and K A Wheeler 2017 Solid State Nuclear Magnetic Resonance 85 1-11. <http://www.sciencedirect.com/science/article/pii/S0926204016300856>
77. H-1 and F-19 spin-lattice relaxation and CH3 or CF3 reorientation in molecular solids containing both H and F atoms. P A Beckmann and A L Rheingold 2016 Journal of Chemical Physics, 144 154308 1-12. <http://scitation.aip.org/content/aip/journal/jcp/144/15/10.1063/1.4944981>
76. Methyl and *t*-butyl group rotation in a molecular solid: H-1 NMR spin-lattice relaxation and X-ray diffraction. P A Beckmann, C E Moore, and A L Rheingold 2016 Physical Chemistry Chemical Physics, 18 1720-1726. <http://pubs.rsc.org/en/content/articlelanding/2016/cp/c5cp04994f - !divAbstract>
75. Nonexponential H-1 spin-lattice relaxation and methyl group rotation in molecular solids. P. A. Beckmann 2015 Solid State Nuclear Magnetic Resonance 71 91-95. <http://www.sciencedirect.com/science/article/pii/S0926204015300060>
74. Methoxy and methyl group rotation: Solid state NMR H-1 spin-lattice relaxation, electronic structure calculations, X-ray diffractometry, and scanning electronic microscopy. P A Beckmann, C W Mallory, F B Mallory, A L Rheingold, and X Wang 2015 ChemPhysChem 16 1509-1519. <http://onlinelibrary.wiley.com/doi/10.1002/cphc.201402716/abstract>
73. Solid state H-1 spin-lattice relaxation and isolated-molecule and cluster electronic structure calculations in organic molecular solids: The relationship between structure and methyl group and *t*-butyl group rotation. X Wang, F B Mallory, C W Mallory, H R Odhner,* and P A Beckmann 2014 J Chem Phys 140 194304 1-15. <http://scitation.aip.org/content/aip/journal/jcp/140/19/10.1063/1.4874157>
72. I-127 and Pb-207 Solid-state NMR spectroscopy and nuclear spin relaxation in lead iodide: A preliminary study. R E Taylor, P A Beckmann, S Bai, and C Dybowski 2014 J Phys Chem C 118 9143-9153. <http://pubs.acs.org/doi/abs/10.1021/jp5023423>
71. Distributions of methyl group rotational barriers in polycrystalline organic solids. P A Beckmann, K G Conn,** C W Mallory, F B Mallory, A L Rheingold, L Rotkina, and X Wang 2013 J Chem Phys 139 204501 1-12. <http://scitation.aip.org/content/aip/journal/jcp/139/20/10.1063/1.4830411>
70. Nonexponential solid state H-1 and F-19 spin-lattice relaxation, single-crystal X-ray diffraction, and isolated-molecule and cluster electronic structure calculations in an organic solid: Coupled methyl group rotation and methoxy group libration in 4,4'-dimethoxyoctafluorobiphenyl. D P Fahey,** W G Dougherty Jr., W S Kassel, X Wang, and P A Beckmann 2012 J Phys Chem A 116 11946-11956. <http://pubs.acs.org/doi/abs/10.1021/jp3075892>

69. Single-crystal X-ray diffraction, isolated-molecule and cluster electronic structure calculations, and scanning electron microscopy in an organic solid: Models for intramolecular motion in 4,4'-dimethoxybiphenyl. X Wang, L Rotkina, H Su, and P A Beckmann 2012 ChemPhysChem 13 2082-2089. <http://onlinelibrary.wiley.com/doi/10.1002/cphc.201101067/abstract>
68. Methyl group rotation, H-1 spin-lattice relaxation in an organic solid, and the analysis of nonexponential relaxation. P A Beckmann and E Schneider* 2012 J Chem Phys 136 054508 1-9. <http://jcp.aip.org/resource/1/jcpsa6/v136/i5/p054508_s1>
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 J Carroll, and F B Mallory 2011 J Org Chem 76 5170-5176. <http://pubs.acs.org/doi/abs/10.1021/jo2006818>
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 Solid State Nuclear Magnetic Resonance 38 31-35. <http://www.sciencedirect.com/science/article/pii/S0926204010000329 - sec4>
65. A review of polytypism in lead iodide. P A Beckmann 2010 Crystal Research and Technology 45 455-460. <http://onlinelibrary.wiley.com/doi/10.1002/crat.201000066/abstract>
64. Methyl and *t*-butyl reorientation in an organic molecular solid. P A Beckmann, W G Dougherty Jr, and W S Kassel 2009 Solid State Nuclear Magnetic Resonance 36 86-91. <http://www.sciencedirect.com/science/article/pii/S0926204009000587>
63. Sn-119 spin-lattice relaxation in α-tin fluoride. G Neue, S Bai, R E Taylor, P A Beckmann, A J Vega, and C Dybowski 2009 Phys Rev B 79 214302 1-5. <http://prb.aps.org/abstract/PRB/v79/i21/e214302>
62. Pb-207 chemical shielding in lead molybdate and lead chloride: 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. <http://pubs.acs.org/doi/abs/10.1021/jp711182z>
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. <http://jcp.aip.org/resource/1/jcpsa6/v128/i12/p124502_s1>
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. <http://www.sciencedirect.com/science/article/pii/S0301010408000827>
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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. <http://pubs.acs.org/doi/abs/10.1021/jp056662y>
56. CF3 rotation in 3-(trifluoromethyl)phenanthrene: Solid state F-19 and H-1 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. <http://pubs.acs.org/doi/abs/10.1021/jp056643o>
55. Cd-111 and Cd-113 spin-lattice relaxation in solid cadmium molybdate 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. <http://prb.aps.org/abstract/PRB/v71/i1/e012410>
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. <http://jcp.aip.org/resource/1/jcpsa6/v120/i11/p5309_s1>
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. <http://jcp.aip.org/resource/1/jcpsa6/v118/i24/p11129_s1>
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. <http://www.sciencedirect.com/science/article/pii/S0301010403001459>
51. Methyl group rotation and ^{1}H and ^{2}H 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. <http://pubs.acs.org/doi/abs/10.1021/jp0111160>
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49. A thermometer for non-spinning solid state NMR spectroscopy. P A Beckmann and C Dybowski 2000 J Mag Resonan 146 379-380. <http://www.sciencedirect.com/science/article/pii/S1090780700921712>
48. H-1 NMR spin-lattice relaxation, C-13 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. <http://jcp.aip.org/resource/1/jcpsa6/v113/i5/p1958_s1>

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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.) <http://pubs.rsc.org/en/content/articlelanding/2000/cc/a909449k>
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 Solid State Nuclear Magnetic Resonance 12 251-256. <http://www.sciencedirect.com/science/article/pii/S0926204098000496>
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. <http://www.znaturforsch.com/aa/v52a/c52a.htm - No10> Click on the underlined page number 757 for the pdf.
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. <http://iopscience.iop.org/0953-8984/8/42/017>
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. <http://pubs.acs.org/doi/abs/10.1021/j100001a058>
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. <http://jcp.aip.org/resource/1/jcpsa6/v100/i1/p752_s1>
40. Proton spin relaxation, internal motion, and structure in solid 1,2,4,5-tetraisopropyl-benzene. H A Al-Hallaq* and P A Beckmann 1993 J Chem Soc: Faraday Trans 89 3801-3804. <http://pubs.rsc.org/en/content/articlelanding/1993/ft/ft9938903801>
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. <http://www.sciencedirect.com/science/article/pii/092145269390476M>
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. <https://books.google.com/books?id=PX7oCAAAQBAJ&pg=PA357&lpg=PA357&dq=peter+beckmann+bryn+mawr&source=bl&ots=xAfe6gJKEt&sig=414k83Ycu9fmlKF_XjnJKWmuCKU&hl=en&sa=X&ved=2ahUKEwi18fW0joXfAhWCVN8KHVE7DO04FBDoATAFegQICxAB - v=onepage&q=peter beckmann bryn m>
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. <http://jcp.aip.org/resource/1/jcpsa6/v95/i7/p4778_s1>

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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. <http://prb.aps.org/abstract/PRB/v38/i16/p11098_1>
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27. Nuclear magnetic resonance spectroscopy and relaxation in molecular solids containing isopropyl groups. Part 2 - The large two phase temperature region in 1,4-diisopropylbenzene. P A Beckmann 1986 J Chem Soc: Faraday Trans 2 82 477-484. <http://pubs.rsc.org/en/content/articlelanding/1986/f2/f29868200477>
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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. <http://pubs.rsc.org/en/content/articlelanding/1985/f2/f29858101013>
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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. <http://www.tandfonline.com/doi/abs/10.1080/00268978300102631>
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13. Proton spin-lattice relaxation in meta-carborane. P A Beckmann and A Wendel 1980 J Chem Phys 73 3514-3515. <http://jcp.aip.org/resource/1/jcpsa6/v73/i7/p3514_s1>
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. <http://jcp.aip.org/resource/1/jcpsa6/v72/i8/p4600_s1>
11. Proton spin relaxation and methyl and hydroxy group motion. P A Beckmann 1979 J Mag Resonan 36 199-205. <http://www.sciencedirect.com/science/article/pii/0022236478900549>
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. <http://www.sciencedirect.com/science/article/pii/0022236478900549>
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8. The electron – methyl group spin-spin interaction. P A Beckmann 1977 Molec Phys 34 665-680. <http://www.tandfonline.com/doi/abs/10.1080/00268977700102031>
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. <http://www.nrcresearchpress.com/doi/abs/10.1139/p77-173>
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. <http://iopscience.iop.org/0022-3719/10/9/002>
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. <http://iopscience.iop.org/0022-3719/10/5/016>
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. <http://www.nrcresearchpress.com/doi/abs/10.1139/p76-264>
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. <http://www.nrcresearchpress.com/doi/abs/10.1139/p76-204>
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. <http://pra.aps.org/abstract/PRA/v6/i4/p1684_1>
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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).

Refereeing

Refereeing is an important professional activity but perspective is important. Over the years, I stopped refereeing for some journals and started with others as my research changed direction and the various journals areas also changed direction. Some journals tended to use me for difficult cases or when the first two referees disagreed. I seemed to pay a price for being so thorough. I stopped refereeing in late 2019.

2010s:

(1) Magnetochemistry
(2) ChemPhysChem
(3) The Journal of Physical Chemistry
(4) Solid State Nuclear Magnetic Resonance
(5) American Journal of Physics
(6) Optical Materials
(7) The Journal of Molecular Structure
(8) Chemical Physics Letters
(9) Crystal Research and Technology
(10) The Journal of Chemical Physics
(11) The Journal of Optics

2000s: some of the above plus . . . .

(12) Chemical Communications of the Royal Society
(13) Journal of Physics: Condensed Matter
(14) Applied Spectroscopy
(15) Physical Review Letters
(16) The New Journal of Physics

1990s: some of the above plus . . . .

(17) Chemical Physics
(18) Physical Chemistry Chemical Physics of the Royal Society
(19) Journal of Physics D: Applied Physics
(20) Physical Review B

late 1970s and 1980s: some of the above plus . . . . .

(21) Physica B
(22) Physical Review E
(23) The Journal of Magnetic Resonance
(24) Molecular Physics

Meetings Attended

I attended 52 research-related professional meetings between 1971 and 2007. I stopped going to meetings in 2007, even though I didn't retire until 2017. 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.

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.

Conference Talks, Colloquia, and Posters

I presented 102 talks, colloquia or posters between 1972 and 2008. I stopped in 2008 even though I didn't retire until 2017. This list indicates 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.

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 ½ 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 Pb-207 and other heavy spin-½ nuclei relaxation in diamagnetic ionic solids due to the 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-½ salts." Contributed poster for the 47th Rocky Mountain Conference on Analytical Chemistry, Denver, Colorado, USA.
97. June 2005 "Low-frequency H-1 and F-19 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 H-1 and H-2 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 Caribou, 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 Caribou, 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.

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). {See papers 57 and 67. Papers 61, 69, 71, 73, and 74 involve work since he became a faculty member in 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). {See paper 39.}
1. Kathleen Conn (PhD 1986) "Investigation of methyl reorientation in solid state methylated phenanthrenes using pulsed proton magnetic resonance." (Graduate student, 1982-86). {See papers 30, 35, and 71.}

B. MA Theses

6. Donald Fahey (MA 2009) "Solid state nuclear magnetic resonance and methyl group rotation in 4,4'-dimethoxyoctaflurobiphenyl" (BMC graduate student 2006 - 2014). {see paper 70.}

5. Laura Happersett (MA 1990) "Proton spin-lattice relaxation in ethylbenzenes" (BMC graduate student, 1987-90). {See paper 36.}

4. Hong Yu (MA 1987) "A study of proton zeeman relaxation and the two phases of 1,3-di-*t*-butylbenzene" (BMC graduate student, 1985-1987). {See paper 31.}

3. Kathleen Gullifer (MA 1986) "Methyl and *t*-butyl reorientation in 3-*t*-butylchrysene" (BMC graduate student, 1984-1986). {See paper 53.}

2. Mary Scott (MA 1986) "Nuclear magnetic resonance and spin-lattice relaxation in organic molecular solids" (BMC graduate student 1981-83, 1985-86). {See papers 20 and 23.}

1. Cheryl Mills (MA 1980) "Proton spin-lattice relaxation and molecular dynamics in 4,4'-methylenebis(di-*t*-butylhydroxybenzene)" (BMC graduate student, 1978-80). {See paper 16.}

C. Undergraduate Theses and Projects

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

59. Morgan Fine-Morris ('14) "A numerical analysis of noisy exponential and non-exponential relaxation data using the stretched-exponential function." (Summer 2012 research.) {48}

58. Hosanna Odhner ('13) "H-1 Nuclear spin relaxation in 2,7-di-*t*-butylpyrene at 22.5 MHz. (Supervised Unit of Research 2011-12). {47} {See paper 73.}

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} {See paper 68.}

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} {See paper 66.}

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}

54. Jessie Rosenberg ('04) "A nuclear magnetic resonance study of 3-CF_3 phenanthrene" (Supervised Unit of Research, 2003-2004). {43} {See paper 56.}

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} {see paper 56}

52. Elizabeth Allocco ('02) "Nuclear magnetic relaxation in 2-*t*-butyl-4-methyl-hydroxybenzene: Relaxation measurements and data analysis" (Supervised Unit of Research, 2001-2002). {41} {See paper 54}

51. Carolyn Kuranz ('02) "Nuclear magnetic relaxation in 2-*t*-butyl-4-methylhydroxy-benzene: Relaxation measurements and experimental methods" (Supervised Unit of Research, 2001-02). {40} {See paper 54}

50. Maria Herd ('02) "Nuclear magnetic resonance of 1-CF_3-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} {See paper 54}
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} {See paper 54}
48. Kendra Burbank ('00) "Zeeman relaxation in a series of related organic molecular solids" (Supervised Unit of Research, 1999-2000). {37} {See paper 48 & 52}
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} {See paper 48}
45. Jessica Ree ('99) "Zeeman relaxation in 2-ethylanthracene" (Supervised Unit of Research, 1998-99). {35} {See paper 52}
44. Matty Lau ('97) "Proton spin-lattice relaxation in 2-*t*-butylanthraquinone" (Supervised Unit of Research, 1996-97). {34} {See paper 52}
43. Tracy Weber ('97) "Proton spin-lattice relaxation in 2-ethylanthraquinone" (Supervised Unit of Research, 1996-97). {33} {See paper 52}
42. Jennifer Mosher ('96) "The analysis of nuclear spin relaxation rate data using the software program Kaleidagraph" (Supervised Unit of Research, 1995-96). {32} {See paper 45}
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} {See paper 38}
40. Mon Thiri Myaing ('97) "Proton spin-lattice relaxation in 1,2,4-triethylbenzene and the effects of thermal history" (Summer 1995 Research). {31} {See paper 44}
39. Lidija Sekaric ('97) "Proton spin-lattice relaxation in 1,3,5-triethylbenzene" (Summer 1995 Research). {30} {See paper 44}
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} {See papers 30, 31, and 40}
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}

34. Stephanie Goellner ('92) "A theoretical study of the stretched exponential function" (Supervised Unit of Research, 1991-92). {26}

33. Jessica Weiss (Haverford '92) "Experimental investigation into types of intra-molecular motion in a series of alkyl-substituted organic compounds" (Supervised Unit of Research, 1991-92). {23} {See papers 41 and 47}

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} {See papers 41 and 43}

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} {See papers 37 and 41}

27. Amy Plofker (Haverford, '90) "Nuclear spin relaxation in isopropylbenzene" (Supervised Unit of Research, 1989-90). {22} {See papers 41 and 42}

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} {See paper 35}

24. William Tong (Whitman '87) "Proton Zeeman relaxation in the three isomers of ethylbenzene" (Summer 1987 Research). {19} {See paper 36}

23. Antonia Herzog (Vasser '87) "Nuclear spin relaxation of benzene in a clathrate" (Summer 1987 Research). {18} {See paper 36}

22. Audrey Hill ('88) "Proton zeeman relaxation in 1,3-di-*t*-butylbenzene at 8.5 and 53 MHz" (Summer 1986 Research). {17} {See paper 31}

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} {See paper 31}

20. Stella Yong ('86) "Spin-lattice relaxation in 4,4'-methylenebis(di-*t*-butylhydroxy-benzene" (Supervised Unit of Research, 1985-86). {15}

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} {See papers 45 and 53}

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} {See papers 23, 24, and 25}

16. Manjula Narasimhan ('85) "A preliminary dipolar relaxation study" (Supervised Unit of Research, 1983-84). {12} {see papers 24 and 25}

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} {See papers 24 and 25}

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} {See papers 24 and 25}

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} {See papers 20, 22, 23, and 25}

11. Ann O'Neill ('83) "Spin-lattice relaxation in 1,4-di-*t*-butylbenzene" (Supervised Unit of Research, 1982-83). {8} {See paper 20, 22, and 23}

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} {See papers 20 and 23}

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} {See papers 16 and 17}

7. Becky Ross ('80) "Proton spin relaxation in 2,6-di-*t*-butylhydroxybenzene" (Supervised Unit of Research, 1979-80). {5} {See paper 17}

6. Meigan Aronson ('80) "Proton spin-lattice relaxation in 3,5-di-*t*-butylhydroxy-benzene" (Supervised Unit of Research, 1979-80). {4} {See paper 16 and 17}

5. Swee Lian Tan ('82) "Nuclear spin relaxation in 4,4'-methylenebis(di-*t*-butylhydroxy-benzene)" (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*-butylhydroxy-benzene)" (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} {See paper 16}

1. Anne Wehrle ('78) "Nuclear spin relaxation in a single crystal of 4-methyl-2,6-di-*t*-butlyhydroxybenzene" (Supervised Unit of Research, 1977-78). {1}

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. I formally retired 31 August 2017.

40 . 2016-17 (the final year) A one-semester leave distributed over both semesters
No committee work

39. 2015-16 No formal committee work
Consulted for the Academic Honor Board 8
Consulted by the Physics Tenure Track Search Committee (Kathryn Daniel) 20

38. 2014-15 Academic Honor Board 7
Physics Tenure Track Search Committee (David Schaffner) 19

37. 2013-2014 College Undergraduate Adviser (fall; semester 3 for this group) 2
College Freshman Adviser 5
Academic Honor Board 6
Leadership Working Group (Board of Trustees); the presidential search 1 (of 1!)

36. 2012-2013 College Undergraduate Adviser (semesters 1 & 2 of 3 for this group) 1
Academic Honor Board 5
Search Committee for the Assistant Provost (Erin Walsh) 1

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 (Laurie Kohler) 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 Gheorhiu) 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 met) 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 by the Board in 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 second-year courses, 300-level courses are third & fourth-year courses, 400-level courses are undergraduate student research, 500-level courses are introductory 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 italicized 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 in the class. Where these numbers differ with numbers obtained from the Registrar's office it is because I use the numbers at midterm and the college uses numbers at the end of the course. 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). I retired 31 August 2017. Over the 40 years, the number of registrations in lecture classes I taught was 2733, the number of registrations in introductory labs I taught was 1253, and the number of registrations in upper level labs I taught was 478.

2016-2017 semester one (40) (a one-semester leave distributed over both semesters)
121L 32 new physics 121 lab using the 'old' physics 214 experiments 10
coordinator for the entire lab and instructor in one of the two labs

2016-2017 semester two (a one-semester leave distributed over both semesters)
102 71 introductory physics for postbaccalaureates (Knight, Jones, and Field) 34

2015-2016 semester one (39)
121 36 modeling the physical world (internet sites and my notes) 10
100L 80 four, two-hour introductory physics lab sections 19
2015-2016 semester two
102 64 introductory physics for postbaccalaureates (Knight, Jones, and Field) 33
322 11 solid state physics (Kittel) 9

2014-2015 semester one (38)
121 36 modeling the physical world (internet sites and my notes) 9
303 9 statistical & thermal physics (Reif) 10
100L 149 administration of (not instructing in) the introductory physics laboratories
2014-2015 semester two
102 74 introductory physics for postbaccalaureates (Knight, Jones, and Field) 32
100L 145 administration of (not instructing in) the introductory physics laboratories

2013-2014 semester one (37)
121 41 modeling the physical world (internet sites and my notes) 9
507 4 graduate statistical mechanics (Reif + papers + internet articles) 2
2013-2014 semester two sabbatical leave

2012-2013 semester one (36)
303 19 statistical & thermal physics (Reif) 9
100L 40 two two-hour introductory physics lab sections 18
201L 14 electronics laboratory 9
2012-2013 semester two
102 55 introductory physics (Knight, Jones, and Field) 31
100L 86 four two-hour introductory physics lab section 19
399 8 senior experience 1

2011-2012 semester one (35)
121 40 modeling the physical world (many web sites and my notes) 7
100L 20+ one (of ten) two-hour introductory physics lab section 16
col sem 12 freshman writing seminar (many books and Scientific American articles) 6
2011-2012 semester two
134/164 39 conceptual physics: nuclear and particle physics (quarter course) (web sites and my notes) 8
100L 60+ three (of nine) two-hour introductory physics lab sections 17
403 1 undergraduate research 43

2010-2011 semester one (34)
121 31 modeling the physical world (internet sites and my notes) 6
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) 30
403 1 undergraduate research 40
2009-2010 semester two sabbatical leave
403 1 undergraduate research 41

2008-2009 semester one (32)
121 39 modeling the physical world (internet sites and texts) 5
303 5 statistical & thermal physics (Reif) 8
100L 70 over two afternoons a week 14
2008-2009 semester two
107/150 82 conceptual physics (internet sites; Lederman & Hill ("Symmetry")) 4
322 5 solid state physics (Kittel) 7

2007-2008 semester one (31) sabbatical leave
403 1 undergraduate research 38
2007-2008 semester two
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

2006-2007 semester one (30)
303 16 statistical & thermal physics (Reif) 7
2006-2007 semester two
107/150 48 conceptual physics (various readings and internet sites) 3
100L 24 introductory physics laboratory, one afternoon 13
322 4 solid state physics (Kittel) 6

2005-2006 semester one (29)
214 15 classical and quantum mechanics (Rohlf and Fowles & Cassiday) 11
2005-2006 semester two
104 16 introductory physics (Tipler and Mosca) 28
302 10 quantum mechanics (Griffiths, 2nd edition) 6

2004-2005 semester one (28)
100L 128 over four afternoons (administrator and instructor) 11
2004-2005 semester two
100L 155 over five afternoons (administrator and instructor) 12

2003-2004 semester one (27) sabbatical leave (60% at Bryn Mawr, 40% at Delaware)
403 2 undergraduate research 36
2003-2004 semester two
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

2002-2003 semester one (26)
103 16 introductory physics (Tipler) 26
303 10 statistical & thermal physics (Reif) 6
2002-2003 semester two
215 4 special relativity, electromagnetism, and particles (Rohlf and Good) 9
215L 4 electronics laboratory 7
322 6 solid state physics (Kittel) 5

2001-2002 semester one (25) [chairman]
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 (several books) 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 (see 2000-01 semester 2)
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 (several books) 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 (several books, grading and one-on-one sessions 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 (several books, grading and one-on-one sessions 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 (several books, grading and one-on-one sessions 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

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 laboratory 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 laboratory 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

1984-1985 semester two (8) ..... sabbatical leave

700	1	graduate research 9

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 3
403	3	undergraduate research 9
700	1	graduate research 5

1982-1983 semester two

102	75	introductory physics I (1/3 semester) (Tipler) 5
201L	9	electronics laboratory (1/2 semester) 2
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	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 (206L) 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 – 1/3 semester courses never to be repeated)
403	1	undergraduate research 2

THE END