

CURRICULUM VITAE

HENRY GORDON BERRY

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Born: July 25, 1940, in Huddersfield, England

Citizenship: British; American (since March 22, 1988)

Married to Mary Hynes-Berry, with four sons

Degrees (in Physics)

Ph.D.	University of Wisconsin, Madison - August 1967
M.Sc.	University of Wisconsin, Madison - June 1963
B.A.	Oxford University, (University College) England - August 1962

Career:

Dec 1994 - Present	Professor, Department of Physics, University of Notre Dame, Notre Dame, IN 46556
1987 - Dec 1994	Senior Physicist, Argonne National Laboratory
1987 - Aug 1994	Adjunct Professor, Physics Department, University of Illinois, Chicago
Jun 1990 - Jan 1991	Acting Director, Academy for Mathematics and Science Teachers in Chicago
Sep 1981 - Mar 1982	Sabbatical at the Laboratoire Aimé Cotton, University of Paris South, Orsay
Mar 1982 - Jul 1982	Sabbatical at the Department of Physics, University of Lund, Sweden
Sep 1976 - Aug 1987	Physicist, Argonne National Laboratory
Jul 1974 - Aug 1976	Assistant Scientist, Argonne National Laboratory
Sep 1972 - Jun 1979	Assistant Professor, Department of Physics, University of Chicago
Oct 1970 - Sep 1972	Assistant Professor (Maitre de Conférences Associé), University of Lyon, France

Sep 1969 - Dec 1970 Guest Researcher, The Research Institute, Stockholm, Sweden

Sep 1968 - Aug 1969 Post Doctoral Fellow, Physics Department, University of Arizona, Tucson

Sep 1967 - Aug 1968 Instructor, University of Wisconsin, Madison

Sep 1962 - Aug 1967 Teaching Assistant or Research Assistant, University of Wisconsin [Came to Wisconsin on an English Speaking Union Fellowship]

Professional Societies:

American Physical Society - Fellow
National Association of Physics Teachers

Professional Service Committees:

Chair of Organizing Committee for the APS Division of Atomic, Molecular and Optical Physics (DAMOP) Annual meeting in Chicago, 1992

American Physical Society (DAMOP): Publications Committee member 1987 - 1989,
Program Committee member 1984 - 1986

Academy of Sciences NRC Committee on Measurements and Standards, member 1988 - present

Academy of Sciences NRC Committee on Atomic Spectra and Linestrengths, member 1981-1988

Chair of Symposium on Atomic Spectra, held at Lisle, IL in August, 1987

Program Advisory Committee, Brookhaven Tandem Van de Graaff Accelerator, member 1977 - 81

Publications:

Editor of eight conference proceedings. Approximately 198 publications in physics journals.

Present research interests:

Atomic structure measurements -

A)

Using fast heavy ion beams, interacting with carbon foils, surfaces and lasers to measure atomic parameters for precision tests of relativistic many body calculations: measurements take place at Notre Dame, Argonne National Laboratory and other facilities, and include

- 1) vacuum ultraviolet wavelength measurements of highly-stripped heavy ions (foil excitation)
- 2) precision lifetimes in neutral and a few times ionized systems (laser excitation)
- 3) hyperfine structure measurements (laser excitation)
- 4) search for anapole moments (laser excitation)

B)

Using synchrotron X-ray sources (Brookhaven, Argonne, Sweden) to create multiple hole excitation and multiple ionization in atoms: measurements include:

- 1) Compton double ionization in helium and other light atoms (Be and B)
- 2) studies of K, KK, KL and KM hole states in heavy atoms - by photo- absorption and photoionization

Edited Proceedings

1. Atomic Physics at High Brilliance Synchrotron Sources: Workshop at Argonne National Laboratory, March 4 and 5, 1993, published as **ANL Report** ANL/APS/tm-14, 1994
Ed. by H.G. Berry.
2. Double Photoionization of Helium with Synchrotron X-rays: Workshop at Argonne National Laboratory, October 4 and 5, 1993, published as **ANL report** ANL/PHY-94/1
Editors: H.G. Berry and Y. Azuma
3. Atomic Physics at the Advanced Photon Source: Workshop at Argonne National Laboratory, March 29-30, 1990, published as **ANL report** ANL/APS/tm-8, 1990
Editors: H.G. Berry, Y. Azuma and N. Berrah Mansour
4. Symposium on the Atomic Spectroscopy of Highly Ionized Atoms (SASHIA), Lysle, Illinois, August 1987, published as Volume **B31**, 1988, Nuclear Instruments and Methods.
Editors: H.G. Berry, R.H. Dunford and L. Young
5. Opportunities for Atomic Physics Using Slow, Highly-Charged Ions: Workshop at Argonne National Laboratory, January 12-13, 1987, published as **ANL Report** ANL-PHY-87-1
Editors: H.G. Berry, R.W. Dunford, D.S. Gemmell and E.P. Kanter
6. Some Aspects of Autoionization in Atoms and Small Molecules: Workshop at Argonne National Laboratory, May 2-3, 1985, published as **ANL Report** ANL-PHY-85-3
Editors: H.G. Berry, J. Berkowitz and R.S. Berry
7. Relativistic Quantum Mechanics: Workshop at Argonne National Laboratory, December 4-5, 1980, published as **ANL report** ANL-PHY-81-1
Editors: H.G. Berry, K.T. Cheng, Y.K. Kim and W. Johnson
8. Proceedings of the 2nd International Conference on Beam-Foil Spectroscopy, at Lysekil, Sweden, July 1970, published as Volume **90**, 1970, Nuclear Instruments and Methods,
Editors: I. Martinson, J. Bromander and H.G. Berry

Publications

1. "Observations of Lamb Shifts in H using Spatially Periodic Potentials," T. Hadeishi, W.S. Bickel, J.D. Garcia, and H.G. Berry, Phys. Rev. Letters 23, 65 (1969).
2. "Mean-Lives of the $2p^2\ ^1D$ Level in F V and O VI," W.S. Bickel, H.G. Berry, I. Martinson, R.M. Schectman, and S. Bashkin, Phys. Letters 29A, 4 (1969).
3. "Durées de vie des niveaux supérieurs de quelques multiplet," H.G. Berry, W.S. Bickel, J. Desesquelles, C.R. Acad. Sc. (Paris) 269, 63 (1969).
4. "Mésure des Probabilités de Transition de Quelques Multiplets Ultraviolet de N I," S. Bashkin, H.G. Berry, W.S. Bickel, et J. Desesquelles, C.R. Acad. Sc. (Paris) 268, 234 (1969).
5. "Relative intensities and exponential decay of a doublet in N V," W.S. Bickel, H.G. Berry, J. Desesquelles, and S. Bashkin, J. Quant. Spectrosc. Rad. Transf. 9, 1145 (1969).
6. "Lifetime Measurements and Absolute Oscillator Strengths for Some Vacuum Ultraviolet Transitions in O I and O II," W.H. Smith, J. Bromander, L.J. Curtis, H.G. Berry, and R. Buchta, Astrophys. J. 165, 217 (1970).
7. "Analysis of Multi-exponential Decay Curves," L.J. Curtis, H.G. Berry, and J. Bromander, Physica Scripta 2, 216 (1970).
8. "Mean Life Measurements in Na, Mg, Al, Si, and K," J. Bromander, H.G. Berry, and R. Buchta, Nucl. Instr. and Methods 90, 55 (1970).
9. "Angular Distributions of Ions Scattered in Thin Carbon Foils," G. Högberg, H. Nordén, and H.G. Berry, Nucl. Instr. and Methods 90, 283 (1970).
10. "Spectroscopic Techniques for Studying the Beam-Foil Interaction," H.G. Berry, J. Bromander, and R. Buchta, Nucl. Instr. and Methods 90, 269 (1970).
11. "Some Mean-Life Measurements in the Na I and Mg I isoelectronic sequence," H.G. Berry, J. Bromander, and R. Buchta, Physica Scripta 1, 18 (1970).
12. "Lifetimes of the K II $4p$ Levels," H.G. Berry, J. Bromander, and R. Buchta, Physica Scripta 1, 179 (1970).
13. "The Foil Spectrum in Beam-Foil Spectra," H.G. Berry, Martinson, and J. Bromander, Phys. Letters 31A, 521 (1970).
14. "Mean-Lives of Some Excited Levels in He I," I. Martinson, W.S. Bickel, J. Bromander, H.G. Berry, L. Lundin, R. Buchta, and I. Bergstrom, J. Opt. Soc. Am. 60, 352 (1970).
15. "Total Transition Probabilities of Some Bowen Levels in O III," H.G. Berry, W.S. Bickel, I. Martinson, J. Weymann, and R.E. Williams, Astrophys. Letters 5, 811 (1970).

16. "The Ultraviolet Beam-Foil spectrum of Fluorine," H.G. Berry, I. Martinson, R.M. Schectman, and W.S. Bickel, *J. Opt. Soc. Am.* 60, 461 (1970).
17. "The Beam-Foil Spectrum of Sulfur 600-4000A," H.G. Berry, R.M. Schectman, I. Martinson, W.S. Bickel, and S. Bashkin, *J. Opt. Soc. Am.* 60, 335 (1970).
18. "The Excitation of ionized Helium States in a Cooled Hollow-Cathode Discharge," H.G. Berry and F.L. Roesler, *Phys. Rev. A*1, 1504 (1970).
19. "Vacancy Cascade Spectroscopy," P. Erman, H.G. Berry, L. Lundin, and B. Sigfridsson, *Proceedings of the 2nd European Conference B.F.S., Lyon 1971*.
20. "Fine Structure Measurements in He I and Li I," H.G. Berry and J.L. Subtil, *Phys. Rev. Lett.* 27, 1103 (1971).
21. "Lifetime Measurements of Autoionizing Levels in He I and Li I by the Beam-Foil Technique," H.G. Berry, J. Desesquelles, and M. Dufay, *Phys. Letters* 36A, 237 (1971).
22. "Lifetime Measurements in Si II, Si III, and Si IV," H.G. Berry, J. Bromander, L.J. Curtis, and R. Buchta, *Physica Scripta* 3, 125 (1971).
23. "Some New Identifications and Lifetimes in Sulphur," H.G. Berry, *J. Opt. Soc. Am.* 61, 983 (1971).
24. "A Mean-Life Measurement of the 3d ²D Resonance Doublet in Si II by a Technique which Exactly Accounts for Cascading," L.J. Curtis, H.G. Berry, and J. Bromander, *Phys. Letters A*34, 169 (1971).
25. "Vacancy cascade Spectroscopy: A convenient Method of studying Highly Ionized Atoms and Molecules," P. Erman and H.G. Berry, *Phys. Letters A*34, 1 (1971).
26. "Lifetimes of Doubly Excited Levels in Neutral Helium," H.G. Berry, I. Martinson, L.J. Curtis and L. Lundin, *Phys. Rev. A*3, 1934 (1971).
27. "Doubly Excited Terms in Lithium and Beryllium," H.G. Berry, J. Bromander, I. Martinson, and R. Buchta, *Physica Scripta* 3, 63 (1971).
28. "Mean-lives of excited levels in O I - O VI," I. Martinson, H.G. Berry, W.S. Bickel, and H. Oona, *J. Opt. Soc. Am.* 61, 519 (1971).
29. "Beam-Foil studies of Nitrogen," H.G. Berry, W.S. Bickel, S. Bashkin, J. Desesquelles, and R.M. Schectman, *J. Opt. Soc. Am.* 61, 947 (1971).
30. "High Resolution Observations of the He II n=3-5, 3204A Transition Excited in a Hollow-Cathode," H.G. Berry, *J. Opt. Soc. Am.* 61, 123 (1971).
31. "Energies and Lifetimes of Doubly Excited States in He I," H.G. Berry, J. Desesquelles, and M. Dufay, *Phys. Rev. A*6, 600 (1972).

32. "Classifications in the Spectra of Autoionization Electrons from Lithiumlike Oxygen and Fluorine," H.G. Berry, Phys. Rev. A6, 514 (1972).
33. "Cascade-induced Alignment Changes of Intensity-Decay Curves," H.G. Berry, L.J. Curtis, and J.L. Subtil, J. Opt. Soc. Am. 62, 771 (1972).
34. "Energies and Mean Lives of Doubly Excited Terms in Lithium," H.G. Berry, E.H. Pinnington, and J.L. Subtil, J. Opt. Soc. Am. 62, 767 (1972).
35. "Larmor Precessions in the 2^3P and 4^3P Terms of Beam-Foil Excited 6Li II and 7Li II," M. Gaillard, M. Carre, H.G. Berry, and M. Lombardi, Nucl Instr. and Methods 110, 273 (1973).
36. "Stark Effect Modulations in He II and Li III," E.H. Pinnington, H.G. Berry, J. Desesquelles, and J.L. Subtil, Nucl. Instr. and Methods 110, 315 (1973).
37. "Fine and Hyperfine Structure Measurements in Light Atoms," H.G. Berry and J.L. Subtil, Nucl. Instr. and Methods 110, 321 (1973).
38. "Doubly-Excited States in Light Atoms," H.G. Berry, J. Desesquelles, and M. Dufay, Nucl. Instr. and Methods 110, 43 (1973).
39. "Quartet System of C IV," H.G. Berry, M.C. Buchet-Poulizac, and J.P. Buchet, J. Opt. Soc. Am. 63, 240 (1973).
40. "Classifications of Some Transitions in Doubly Excited Li," M.C. Buchet-Poulizac, H.G. Berry, and G.W.F. Drake, Phys. Rev A7, 992 (1973).
41. "Fine Structure Measurements in He I," H.G. Berry, J.L. Subtil, and M. Carre, J. de Phys. 33, 947 (1973).
42. "The Lamb Shift in Two Electron Atoms," H.G. Berry and R. Bacis, Phys. Rev. A8, 36 (1973).
43. "The Hyperfine Structure of $1snp$ 3P Terms of $^{6,7}Li$ II," H.G. Berry, J.L. Subtil, E.H. Pinnington, H.J. Andra, W. Wittman, and A. Gaupp, Phys. Rev. A7, 1609 (1973).
44. "Beam-Foil-Gas Spectroscopy," W.S. Bickel, M. Dufay, J. Desesquelles and H.G. Berry, Nucl. Instr. and Methods 110, 69 (1973).
45. "High Resolution Study of $2s$ 3S - $2p$ 3P in $^{6,7}Li$ II," R. Bacis and H.G. Berry, Phys. Rev. A10, 466 (1974).
46. "The Fine Structure and Lamb Shift of $2s$ 3S - $2p$ 3P in N VI," H.G. Berry and R.M. Schectman, Phys. Rev. A9, 2345 (1974).
47. "Anisotropy in the Beam-Foil Light Source," H.G. Berry, L.J. Curtis, D.G. Ellis and R.M. Schectman, Phys. Rev. Lett. 32, 751 (1974).

48. "Lifetimes of some Highly-Excited Terms in Cl IV-Cl IX," S.N. Bhardwaj, H.G. Berry and T. Mossberg, *Physica Scripta* 9, 331 (1974).
49. "Line Identifications in the Beam-Foil Spectrum of Boron," H.G. Berry and J.L. Subtil, *Physica Scripta* 9, 217 (1974).
50. "Doubly-Excited States of Na I," H.G. Berry, R. Sjödin, R. Hallin and M. Gaillard, *Phys. Lett.* 50A, 191 (1974).
51. "Orientation and Alignment of Atoms by Beam-Foil Excitation," H.G. Berry, S.N. Bhardwaj, L.J. Curtis and R.M. Schectman, *Phys. Letters* 50A, 59 (1974).
52. "Failure to Observe Coherent Effects in the Excitation of Channeled Ions," H.G. Berry, D.S. Gemmell, R.E. Holland, J.C. Poizat, J. Remillieux and J.N. Worthington, *Phys. Letters* 49A, 123 (1974).
53. "Fine and Hyperfine Structure Constants of the np^3P ($n=2-5$) Terms of ${}^{6,7}\text{Li II}$," H.G. Berry, E.H. Pinnington and J.L. Subtil, *Phys. Rev.* A10, 1065 (1974).
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55. "Multiply-Excited States in Beam-Foil Spectroscopy," H.G. Berry, *Physica Scripta* 12, 5 (1975).
56. "Tests of the Final Surface Electrostatic Interaction in Beam-Tilted Foil Experiments," H.G. Berry, L.J. Curtis and R.M. Schectman, *Phys. Rev. Lett.* 34, 309 (1975).
57. "Meanlife Measurements of Ionized Ar and Fl at Grazing Incidence Wavelengths," H.G. Berry, J. Desesquelles, P. Tryon, P. Schnur and G. Gabrielse, *Phys. Rev.* A14, 1457 (1976).
58. "Spectroscopy of Heavy Ions Using the Beam Foil Technique," H.G. Berry and C.H. Batson, 4th Int. Conf. on BFS, Sept 75 Proceedings, Vol. 1, p. 367 (1976).
59. "The Surface Interaction in Beam-Foil Spectroscopy," H.G. Berry, L.J. Curtis, D.G. Ellis, R.D. Hight and R.M. Schectman, 4th Int. Conf. on Beam Foil Spectroscopy, Sept, 1975 - Proceedings, Vol. 2, p. 755 (1976).
60. "Doubly-Excited States in B III," K.X. To, E.J. Knystautas, R. Drouin and H.G. Berry, 4th Int. Conf. on Beam Foil Spectroscopy, Sept, 1975 - Proceedings, Vol. 1, p. 385 (1976).
61. "Experimental Lifetimes in Vanadium V," H.G. Berry, *Physica Scripta* 13, 36 (1976).
62. "Thin Foils for Beam-Foil Spectroscopy," H.G. Berry, Proceedings of the Third International Target Makers Conference, p. 193., Edited by G. Thomas, ANL/PHYS/MSD I - 1976.

63. "Spatial Asymmetries in Atomic Collisions," H.G. Berry, L.J. Curtis, D.G. Ellis and R.M. Schectman, Intl. Symposium on Electron and Photon Interactions with Atoms, July 1976; Proceedings, p.515 (1976).
64. "Optical Observations of the Dissociation of Fast Molecules in Thin Foils," H.G. Berry, A.E. Livingston and G. Gabrielse, Phys. Letters 64A, 68 (1977).
65. "Production of orientation and Alignment in Heavy Ion-Surface Collisions," H.G. Berry, G. Gabrielse and A.E. Livingston, Phys. Rev. A16, 1915 (1977).
66. "Alignment of Helium Excited by Thin Carbon Foils," R.D. Hight, R.N. Schectman, H.G. Berry, G. Gabrielse and T. Gay, Phys. Rev. A16, 1805 (1977).
67. "Measurement of the Stokes Parameters of Light," H.G. Berry, G. Gabrielse and A.E. Livingston, App. Opt. 16, 3200 (1977).
68. "Alignment Effects in Heavy and Highly Ionized Beam-Foil Excited Atoms," L.J. Curtis, R. Hallin, J. Lindskog, J. Pihl and H.G. Berry, Phys. Lett, 60A, 297 (1977).
69. "Orientation of Fast Ions by Surface Scattering," H.G. Berry, G. Gabrielse, A.E. Livingston, J. Desesquelles and R.M. Schectman, Phys. Rev. Lett, 32, 1473 (1977).
70. "Beam-Foil Spectroscopy," H.G. Berry, Reports of Progress in Physics 40, 155 (1977).
71. "Orientation and Alignment in Beam Tilted-Foil Spectroscopy," H.G. Berry, Bell Labs IWIISC Conference, July, 1976, Proceedings, p. 309. Edited by N. Tolk. Academic Press, 1977.
72. "Material-dependent variations of alignment in beam-foil excitation," H.G. Berry, G. Gabrielse, T.J. Gay, and A.E. Livingston, Physica Scripta 16, 99-104 (1977).
73. "Orientation of fast ions excited in surface collisions," H.G. Berry, G. Gabrielse, and A.E. Livingston, Nucl. Instr. Meths. 149, 517-522 (1978).
74. "Fine structure of the $1s2s2p\ ^4P^o$ and $1s2p^2\ ^4P$ doubly excited states in lithiumlike carbon, nitrogen and oxygen," A.E. Livingston and H.G. Berry, Phys. Rev. A17, 1966-1975 (1978).
75. "Mean-life measurements for some fluorine transitions in the quartz region," E.H. Pinnington, D.J.G. Irwin, A.E. Livingston, J.A. Kernahan, R.N. Gosselin, and H.G. Berry, Can. J. Phys. 56, 517-521 (1978).
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81. "Alignment, orientation and the beam-foil interaction," R.M. Schectman, L.J. Curtis, and H.G. Berry, *J. Phys. (Paris), Suppl.* 40, C1, 289-294 (1979).
82. "Doubly excited states of the Li I isoelectronic sequence," K.X. To, E.J. Knystautas, R. Drouin and H.G. Berry, *J. Phys. (Paris), Suppl.* 40, C1, 3-5 (1979).
83. "Temperature dependence of alignment production in He I by beam-foil excitation," T.J. Gay and H.G. Berry, *Phys. Rev.* A19, 952-961 (1979).
84. "Comment on "Doppler-tuned hyperfine spectroscopy of the lithium ion," H.G. Berry and R. Bacis, *Phys. Rev.* A19, 2464-2465 (1979).
85. "Energies and lifetimes of excited states in copper-like Kr VIII," A.E. Livingston, L.J. Curtis, R.M. Schectman, and H.G. Berry, *Phys. Rev.* A21, 771-781 (1980).
86. "Optical Observations of molecular dissociation in thin foils," T.J. Gay and H.G. Berry, *J. Phys.* B13, L199-L204 (1980).
87. "Recent results in $\Delta n=0$, $n=2$ transitions of helium-like systems," R. DeSerio, H.G. Berry, and R.L. Brooks, *Proceedings of the ANL workshop on Relativistic Quantum Mechanics*, Edited by H.G. Berry, K.T. Cheng, Y.K. Kim and W. Johnson, Dec 4-5, 1980.
88. "Wavelength measurements of the $1s2s\ ^3S - 1s2p\ ^3P$ transitions in helium-like $^{28}\text{Si}^{12+}$, $^{32}\text{S}^{14+}$, and $^{35}\text{Cl}^{15+}$," A.E. Livingston, S.J. Hinterlong, J.A. Poirier, R. DeSerio, and H.G. Berry, *J. Phys.* B13, L139-L142 (1980).
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94. "Molecular effects in beam-foil collision-induced alignment of He I," T.J. Gay, H.G. Berry, and R. DeSerio, Phys. Rev. A23, 1761-1774 (1981).
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Recent invited talks (from January 2000)

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Search for highly excited sextet transitions, Seminar, Laboratoire de Spectrométrie Ionique et Moléculaire, University of Lyon, France, July 2000.

New optical measurements in C60, Colloquium, Physics Department, University of Nebraska, Lincoln.

Energy pathways in the breakup of highly ionized C60 molecules, Colloquium, Physics Department, University of Nevada, Reno, April 2001.

Re-educating Teachers (K-12) about Modern Science, Christian Educators Association Annual Meeting, October 18, 2001.

“Atomic Tests of Parity Non-Conservation and the Standard Model,” Colloquium, Department of Physics, University of Toledo, Ohio, January 29, 2003.

“New Measurements of the Weak Charge Q_w ,” Seminar, High Energy Group, University of Chicago, Illinois, July 9, 2003.

“Milton meets Einstein – Inquiring Minds want to Know,” Physics Colloquium, University of Nebraska, Lincoln, Nebraska, April 2009.

“When Milton meets Galileo: Inquiring Minds,” Physics Colloquium, University of Western Michigan, Kalamazoo, Michigan, April 2009.