

CURRICULUM VITAE:
Keith Bradford MacAdam

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BIRTHPLACE: Rochester, NY, U.S.A.

ADDRESS: Home: 717 Beechmont Road
Lexington, KY 40502-2837
Tel. (859) 268-0998

Office: Department of Physics and Astronomy
University of Kentucky
Lexington, KY 40506-0055
Tel. (859) 257-3344
E-mail: macadam@email.uky.edu
Homepage: <http://pa.as.uky.edu/users/macadam>

CITIZENSHIP: U.S.A.

EDUCATION:

9/65-5/71 Harvard University, Cambridge, MA.
M.A. in Physics, 3/67.
Ph.D. in Physics, 6/71.

Research in molecular-beam magnetic-resonance spectroscopy under Prof. N.F. Ramsey. Dissertation: "The Anisotropy of the Electric Polarizability of H₂ and D₂."

9/61-5/65 Swarthmore College, Swarthmore, PA
B.A. (Honors) in Mathematics, 6/65.

EXPERIENCE:

7/08- Emeritus Prof. of Physics, U. Kentucky

5/06-12/15 Associate Editor, Physical Review A (American Physical Society)

8/01-12/01 Visiting Scientist, Dept. of Atomic Physics, Stockholm University, Sweden, supported by a grant from the Royal Swedish Academy of Sciences

7/97-6/01 Chair, Dept. Physics and Astronomy, U. Kentucky

7/86-6/08 Professor of Physics, U. Kentucky

8/91-8/92 Visiting Fellow, Joint Institute for Laboratory Astrophysics, University of Colorado, Boulder, CO.

7/90-6/91 University Research Professor, U. Kentucky.

- 7/83-12/83 Visiting Scientist, Institute of Physics, University of Aarhus, Denmark.
- 7/81-6/86 Associate Professor of Physics, (tenure), U. Kentucky.
Member of the Graduate Faculty
- 8/77-6/81 Assistant Professor of Physics, University of Kentucky, Lexington, KY.

Experimental research on Rydberg atoms. Supervision of research work by post-doctoral, graduate, and undergraduate assistants. Teaching duties. Departmental and University committee assignments.

- 9/73-6/77 Research Associate, Physics Department, Yale University (until 7/74) and University of Arizona (7/74-6/77).

Experimental research on fine structure and collisions of highly excited (Rydberg) states of He by microwave resonance techniques with Profs. Willis E. Lamb, Jr. and William H. Wing.

- 9/71-8/73 Post-doctoral Research Fellow, Physics Department, University of Stirling, Stirling, Scotland. Concurrently, Frank Knox Memorial Traveling Fellow of Harvard University.

Experimental research on electron-photon angular correlation in electron-atom collisions with Prof. H. Kleinpoppen.

PUBLICATIONS:

1. T.C. English and K.B. MacAdam, "Molecular Beam Resonance Measurement of the Deuterium Polarizability Anisotropy", Phys. Rev. Lett. 24, 555 (1970).
2. K.B. MacAdam and N.F. Ramsey, "Molecular-Beam Measurements of the Anisotropies of the Electric Polarizabilities of H₂ and D₂", Phys. Rev. A 6, 898 (1972).

Note: Paper #2 was reprinted in: Norman F. Ramsey, "Spectroscopy with Coherent Radiation: Selected Papers of Norman F. Ramsey, With Commentary" (World Scientific, Singapore, 1998).

3. M. Eminyan, K.B. MacAdam, J. Slevin, and H. Kleinpoppen, "Measurements of Complex Excitation Amplitudes in Electron-Helium Collisions by Angular Correlations Using a Coincidence Method", Phys. Rev. Lett. 31, 576 (1973).
4. M. Eminyan, K.B. MacAdam, J. Slevin, and H. Kleinpoppen, "Electron-Photon Angular Correlations in Electron-Helium Collisions: Measurements of Complex Excitation Amplitudes, Atomic Orientation and Alignment", J. Phys. B 7, 1519 (1974).

Note: Paper #4 was reprinted with fifteen other papers on electron-atom collisions in "Series of Selected Papers in Physics", published by the Physical Society of Japan (1976).

Note: Papers #3 and #4 were reprinted among Selection of Historic Papers (1925-1976) in N. Andersen and K. Bartschat, "Polarization, Alignment and Orientation in Atomic

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Collisions (Springer-Verlag, New York, 2001).

5. M. Eminyan, K.B. MacAdam, J. Slevin, M.C. Standage and H. Kleinpoppen, "Electron-Photon Angular Correlations in Electron-Helium Collisions for 3^1P Excitations", J. Phys. B 8, 2058 (1975).
6. K.B. MacAdam and W.H. Wing, "Fine Structure of Rydberg States: $n = 6$ and 7 D and F States of 4He ", Phys. Rev. A 12, 1464 (1975).
7. J. Slevin, M. Eminyan, and K.B. MacAdam, "Some Aspects of Channel Electron Multiplier Operation", J. Phys. E 8, 1000 (1975).
8. K.B. MacAdam and W.H. Wing, "Fine Structure of Rydberg States. II. $n = 8$ and 9 D and F States and $n = 16, 17$, and 18 P and D states of 4He ", Phys. Rev. A 13, 2163 (1976).
9. K.B. MacAdam and W.H. Wing, "Fine Structure of Rydberg States. III. New Measurements in D, F, and G States of 4He ", Phys. Rev. A 15, 678 (1977).
10. W.H. Wing and K.B. MacAdam, "The Microwave-Optical Resonance Method", in Progress in Atomic Spectroscopy, Part A, edited by W. Hanle and H. Kleinpoppen (Plenum, New York, 1978), pp. 491-527.
11. J. Farley, K.B. MacAdam, and W.H. Wing, "Fine Structure of Rydberg States. IV. Completely Resolved Fine Structure in D, F, and G States of 4He ", Phys. Rev. A 20, 1754 (1979).
12. K.B. MacAdam, D.A. Crosby, and R. Rolfes, " n -Dependence of l -Changing Collisions Between He^+ Ions and Na", Phys. Rev. Lett. 44, 980 (1980).
13. P.A. Ekstrom, D.A. Crosby, and K.B. MacAdam, "High-Voltage Linear Pulse Amplifier", Rev. Sci. Instrum. 51, 1700 (1980).
14. D.A. Crosby and K.B. MacAdam, "Simple Fast Transient Digitizer", Rev. Sci. Instrum. 52, 297 (1981).
15. K.B. MacAdam, R. Rolfes, and D.A. Crosby, " l -Change in Sodium Rydberg Atoms Induced by Ion Collisions Near the Matching Velocity", Phys. Rev. A 24, 1286 (1981).
16. K.B. MacAdam, "Charge Transfer from Rydberg Atoms", Comm. At. Mol. Phys. 11, 53 (1981).
17. K.B. MacAdam and R.G. Rolfes, "An Inhomogeneous-Field Stripper for Field-Ionization Detection and Analysis of Fast Beams of Highly Excited Atoms", Rev. Sci. Instrum. 53, 592 (1982).
18. K.B. MacAdam and R.G. Rolfes, "Rydberg-to-Rydberg Charge Transfer in Sodium", J. Phys. B 15, L243 (1982).
19. R.G. Rolfes and K.B. MacAdam, "Final-State Distributions in Charge Transfer from Sodium

- Rydberg Atoms Near the Matching Velocity", J. Phys. B 15, 4591 (1982).
20. K.B. MacAdam and R.G. Rolfes, "Velocity Dependence of Rydberg $n \rightarrow n'$ Charge-Transfer Cross Sections", J. Phys. B 16, 3251 (1983).
21. R.G. Rolfes, D.B. Smith, and K.B. MacAdam, "High- n_1 Stark-State Production by Sudden Electric-Field Reversal in Rydberg Sodium", J. Phys. B 16, L533 (1983).
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23. E.H. Nielsen, L.H. Andersen, A. Bárány, H. Cederquist, P. Hvelplund, H. Knudsen, K.B. MacAdam and J. Sørensen, "Energy Gain Spectroscopy Measurements of Single-Electron Capture by Ar^{6+} in Ne and Ar", J. Phys. B 17, L139 (1984).
24. K.B. MacAdam, D.B. Smith, and R.G. Rolfes, " l -Mixing in Sodium $n = 28$ Caused by Multiple Ion Impacts: Evolution of the Final-State Distribution", J. Phys. B 18, 441 (1985).
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27. N.L.S. Martin, A.D. Arvin, and K.B. MacAdam, "The Low Field Stark Effect in Alkali Rydberg States: A Measurement of Na $n = 30$ Level Crossings Between $|m_l| = 2$ and 3", in Atomic Excitation and Recombination in External Fields, edited by M.H. Nayfeh and C.W. Clark (Gordon and Breach, New York, 1985), p. 299.
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31. K.B. MacAdam, "Failure of Classical Scaling in Low Velocity Charge Transfer from Rydberg Atoms", Phys. Rev. A 34, 2767 (1986).
32. K.B. MacAdam, R.G. Rolfes, X. Sun and D.B. Smith, "Strong-Coupling Effects in Charge Transfer and l Change Observed in Intermediate Velocity Collisions of Ions on Rydberg-Atom Targets", Nucl. Instrum. Methods B24/25, 280 (1987).

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40. K.B. MacAdam, "How Does Rydberg Charge Transfer Vary Over the Intermediate Velocity Region?" *Nucl. Instrum. Methods* B56/57, 253 (1991).
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42. R.G. Rolfes, L.G. Gray and K.B. MacAdam, "Collisions of Na^+ Ions with Na Rydberg Atoms in Electric Fields: Depopulation Cross Sections and Final-State Distributions from $36s$ and $30p$ Initial States", *J. Phys. B* 25, 2319 (1992).
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47. S.B. Hansen, T. Ehrenreich, E. Horsdal-Pedersen, K.B. MacAdam and L.J. Dubé, "Electron Capture from Circular Rydberg Atoms", *Phys. Rev. Lett.* 71, 1522 (1993).

48. K.B. MacAdam, "Collisions of Rydberg Atoms with Ions: A Review of Recent Work on Charge Transfer from Highly Excited Targets", in Physics of Electronic and Atomic Collisions, edited by T. Andersen, B. Fastrup, F. Folkmann, H. Knudsen and N. Andersen (American Institute of Physics, New York, 1993), p. 183.
49. S.B. Hansen, T. Ehrenreich, E. Horsdal-Pedersen and K.B. MacAdam, "Electron Capture from Circular Rydberg Atoms", in Physics of Electronic and Atomic Collisions, edited by T. Andersen et al. (American Institute of Physics, New York, 1993), p. 828.
50. X. Sun and K.B. MacAdam, "Microwave Measurements of d - f - g - h Intervals and d and f Fine-Structure of Sodium Rydberg States", *Phys. Rev. A* 49, 2453 (1994).
51. R.G. Rolfes, V.D. Irby, O.P. Makarov, R.C. Dickinson and K.B. MacAdam, "Onset of Dipole-Allowed Transitions in Inelastic Collisions of Charged Particles with Na(30s) Rydberg Atoms", *J. Phys. B* 27, 1167 (1994).
52. W.K. Trail, M.A. Morrison, H.L. Zhou, B.L. Whitten, K. Bartschat, K.B. MacAdam, T.L. Goforth and D.W. Norcross, "Low-Energy Electron Collisions with Sodium: Elastic and Inelastic Scattering from the Ground State", *Phys. Rev. A* 49, 3620 (1994).
53. L.G. Gray and K.B. MacAdam, "Charge Asymmetry in Collisional Depopulation of Na 36s Rydberg Atoms", *J. Phys. B* 27, 3055 (1994).
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56. H.L. Zhou, B.L. Whitten, W.K. Trail, M.A. Morrison, K.B. MacAdam, K. Bartschat and D.W. Norcross, "Low-Energy Electron Collisions with Sodium: Scattering of Spin-Polarized Electrons", *Phys. Rev. A* 52, 1152 (1995).
57. K.B. MacAdam, J.C. Day, J.C. Aguilar, D.M. Homan, A.D. MacKellar and M.J. Cavagnero, "Transient Molecular-Ion Formation in Rydberg-Electron Capture", *Phys. Rev. Lett.* 75, 1723 (1995).
58. V.D. Irby, R.G. Rolfes, O.P. Makarov, K.B. MacAdam and M.I. Syркин, "Absolute Cross Sections for the Dipole-Allowed Transitions 30s-30p and 29d-30p in Collisions Between Charged Particles and Na Rydberg Atoms", *Phys. Rev. A* 52, 3809 (1995).
59. E. Horsdal-Pedersen, J.C. Day, B. DePaola, T. Ehrenreich, S.B. Hansen, Y. Leontiev, K.B. MacAdam and K.S. Mogensen, "Application of Coherent Rydberg States for Collision Studies", in The Physics of Electronic and Atomic Collisions, XIX International Conference (Whistler BC, Canada, 1995), edited by L.J. Dubé *et al.* (American Institute of Physics, New York, 1995), p. 609.

60. S. Dyubko, V. Efremov, S. Podnos, X. Sun and K.B. MacAdam, "Quantum Defects of the Sodium Atom in f , g and h States", J. Phys. B 30, 2345 (1997).
61. K.B. MacAdam, D.M. Homan, O.P. Makarov and O.P. Sorokina, "Angle and Velocity variation of Electron Capture from a Stark State", in Application of Accelerators in Research and Industry, edited by J.L. Duggan and I.L. Morgan (AIP Press, New York, 1997), p.79.
62. D.M. Homan, K.B. MacAdam and M.J. Cavagnero, "Anomalous Final State Distributions of Electrons Captured from Directed Rydberg States", Phys. Rev. A 57, R13 (1998).
63. D.M. Homan, O.P. Makarov, O.P. Sorokina, K.B. MacAdam, M. Lundsgaard, C.D. Lin, and N. Toshima, "Electron Capture from a Directed Stark Rydberg State. Fore-and-Aft Ratios", Phys. Rev. A 58, 4565 (1998).
64. J.L. Horn, D.M. Homan, C.S. Hwang, W.L. Fuqua III and K.B. MacAdam, "Electrostatic Cage "Stark Barrel" for Rapidly Switching a Uniform Electric Field Through Arbitrary Angles", Rev. Sci. Instrum. 69, 4086 (1998).
65. K.B. MacAdam, J.C. Day and D.M. Homan, "Electron Capture from Rydberg Atoms by a Direction-of-Approach Method", Comments on At. Mol. Phys., Comm. on Modern Physics, Vol. 1(2), Part D, pp. 57-73 (1999)
66. O.P. Makarov and K.B. MacAdam, "Ionization of Rydberg atoms of sodium by 360 - 4400 eV alkali ions", Phys. Rev. A 60, 2131 (1999).
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68. K.B. MacAdam and C.S. Hwang, "The Stark ball: A programmable multipolar environment", Rev. Sci. Instrum. 74, 2267 (2003).
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1410 (1979).

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115. S.F. Dyubko, V.A. Efremov, V.G. Gerasimov, M.N. Efimenko and K.B. MacAdam, "Laser-microwave spectrometer for investigation of Al atom Rydberg states", (CAOL 2003: 1st International Conference on Advanced Optoelectronics and Lasers, Alushta, Crimea, Ukraine, 16-20 Sept. 2003).
116. K. Nagesha and K.B. MacAdam, "A new method for measuring absolute cross sections for electron impact ionization of high Rydberg atoms", (2003 GEC Meeting, San Francisco CA, October 2003). Abstract: Bull. Am. Phys. Soc. 48 (6), 34 (2003).
117. K. Nagesha and K.B. MacAdam, "Absolute cross sections for electron impact ionization of sodium Rydberg atoms below 2 eV", (2003 GEC Meeting, San Francisco CA, October 2003). Abstract: Bull. Am. Phys. Soc. 48 (6), 60 (2003).
118. S.F. Dyubko, V.A. Efremov, V.G. Gerasimov, and K.B. MacAdam, "Microwave spectroscopy of Al Rydberg atoms: Quantum defect analysis of new measurements in S, P, D, F and G states", (DAMOP-APS, May 2004, Tucson AZ). Abstract: Bull. Am. Phys. Soc. 49 (3),

117 (2004).

119. S.F. Dyubko, V.A. Efremov, V.G. Gerasimov, M.N. Efimenko and K.B. MacAdam, "Laser-microwave spectroscopy of Au atoms Rydberg states", Proc. of CAOL 2005 (2nd Int. Conf. on Advanced Optoelectronics and Lasers), vol. 1, p.150. (12-17 Sept. 2005, Yalta, Crimea, Ukraine).

120. V.A. Efremov, S.F. Dyubko, V.G. Gerasimov, and K.B. MacAdam, "Specification of the Ionization Potential of Al I", Proc. of 8th Int'l Conf. on Laser and Fiber-Optical Networks Modeling (LFNM 2006, 29 June - 1 July 2006, Kharkiv, Ukraine), pp.100-103.

121. B.A. DeHarak, K.D. Wells, K.B. MacAdam and N.L.S. Martin, "Electron impact autoionization in the presence of a laser field", (DAMOP-APS, May 2008, State College PA). Abstract: Bull. Am. Phys. Soc. 53 (7), 174 (2008).

122. S.F. Dyubko, V.A. Efremov, V.G. Gerasimov, M.N. Efimenko, M.P. Perepechay and K.B. MacAdam, "Laser-microwave spectroscopy of Cu I atoms in S Rydberg state", Proc. of 4th Int'l Conf. on Advanced Optoelectronics and Lasers (CAOL 2008, 29 Sept - 4 Oct 2008, Alushta, Crimea, Ukraine), pp.334-337.

123. S.F. Dyubko, V.A. Efremov, V.G. Gerasimov, M.N. Efimenko, M.P. Perepechay and K.B. MacAdam, "Laser-microwave spectroscopy of Au I atoms in F Rydberg state", Proc. of 5th Int'l Conf. on Advanced Optoelectronics and Lasers (CAOL 2010, September 10-14, 2010, Sevastopol, Crimea, Ukraine). p.255-256.

124. S.F. Dyubko, V.A. Efremov, A.S. Kutsenko, N.L. Pogrebnyak and K.B. MacAdam, "Laser-microwave spectroscopy of singlet Mg I atoms in S,P,D,F,G Rydberg state", Proc. of 6th Int'l Conf. on Advanced Optoelectronics and Lasers (CAOL 2013, Sept. 9-13, 2013, Sudak, Crimea, Ukraine).

INVITED COLLOQUIA, SEMINARS:

Invited colloquia or seminars were given since 1971 at the following institutions:

Argonne National Laboratory
Centre College, Danville, KY
College of William and Mary
Colorado State University
Eastern Kentucky University
Georgia Institute of Technology
Hahn-Meitner Institute, Berlin, Germany
Harvard University
Kansas State University
Louisiana State University
Lund University, Sweden
Massachusetts Institute of Technology

Max Planck Institute for the Physics of
Complex Systems, Dresden,
Germany
Miami University, OH
Oak Ridge National Laboratory
Oberlin College
Ohio State University
SRI International, Palo Alto, CA
Texas A & M University
Union College, Barbourville, KY
University of Aarhus, Inst. of Phys. and
Astron. (IFA), Denmark

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University of Arizona
University of Bergen, Norway
University of Chicago
University of Cincinnati
University of Colorado - Boulder
University of Freiburg, W. Germany
University of Kentucky
University of Louisville
University of Massachusetts
University of Michigan
University of Missouri-St. Louis
University of Nebraska
University of Nevada - Las Vegas
University of North Carolina

University of Notre Dame
University of Oklahoma
University of Rochester
University of Southampton, England
University of Stirling, Scotland
University of Stockholm, Sweden
University of Tennessee
University of Toledo
University of Virginia
Wesleyan University
Western Kentucky University
Yale University

Additional invited talks were given at conferences as follows:

1. "The Physics of Highly Excited Atoms", Annual Meeting of Appalachian Section AAPT, (Montgomery, WV, November 1980).
2. "Collisions of Ions with Highly Excited Atoms", Seminar on Collision Experiments in Their Theoretical Frame, (University of Chicago, May 1981).
3. "Collisions of Ions with Highly Excited Atoms", VII International Seminar on Ion-Atom Collisions, (Storrs CT, July 1981).
4. "Impact Ionization of State-Selected Na Rydberg Atoms by Ion Bombardment", IX International Seminar on Ion-Atom Collisions (Flagstaff AZ, August 1985).
5. "These Most Delicate Atoms", UK College of Arts and Sciences Dean's Forum, April 1985. First Natural Sciences lecture in this series.
6. "Collisions Involving Atoms in Rydberg States", Workshop on Complex R-Plane Techniques, (Charlottesville VA, October 1993).
7. "Laser-Based Rydberg Atom Collision Experiments", Workshop on Unique Instrumentation for Accelerator Based Atomic Physics Experiments (Denton TX, November 1994).
8. "Collisions of Ions with Off-Center Na Rydberg States", International Workshop on Heavy Particle Collisions Involving Optically Prepared Atoms (Gif-sur-Yvette, France, 20-21 July 1997).
9. "Electron Capture from Rydberg Stark States of Na by a Direction-of-Approach Experimental Method", Nordplus Summer Course and Meeting in Atomic Physics (Nesjavellir, Iceland, June 12-16, 1998).
10. "Collisions of Ions with Laser-Prepared Rydberg Atoms", Mini-Rydberg Conference, Inst. Phys. & Astron. (IFA), U. Aarhus, Denmark (Nov. 1-2, 2001).

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11. "Collisions of Rydberg Atoms with Charged Particles", invited lecture at International Workshop and Seminar on Rydberg Physics, Dresden, Germany, May 2004.

PUBLISHED BOOK REVIEWS AND RESEARCH REVIEWS:

Review of **Elphyma Tables**, compiled by E. Ingelstam and S. Sjöberg (Wiley & Sons, Inc., New York, 1964) in *J. Opt. Soc. Am.* 54, 1495 (1964).

Review of **Letters on Wave Mechanics**, edited by K. Przibram (Philosophical Library, New York, 1967) in *J. Opt. Soc. Am.* 58, 592 (1968).

Review of **Angular Momentum Theory for Diatomic Molecules**, by B.R. Judd (Academic Press, New York, 1975) in *J. Opt. Soc. Am.* 65, 1084 (1975).

"Collisions Feel the Cold", Physics in Action article in *Physics World* 14 (12), 24 (Dec. 2001).

"Memories of An Editor", OSA History article in *OPN Optics and Photonic News* (Sept. 2011, pp 21-22).

TEXTBOOKS:

"Degeneracy", article in **Macmillan Encyclopedia of Physics**, edited by J.S. Rigden (Simon & Schuster Macmillan, New York, 1996), pp. 340-1.

Physics co-Editor for G. Mathew and N.N. Mathew, **Conceptual Work Book Series** (Refcon Publishing Co., KY, 1997).

Contributing Editor to Children's Science E-Book, **How the World Works**, by G. Mathew, published by Refcon Books, Highland Heights KY (2000). See URL:
<http://www.cutescience.com/files/children/ebook.html>

RESEARCH GRANTS:

Cottrell Research Grant, Research Corporation, \$11,000 (May 1978).
"Near-Resonant Charge Transfer in Highly Excited Atoms."

National Science Foundation, \$70,000 (September 1978 - August 1980).
"Near-Resonant Charge Transfer in Highly Excited Atoms."

National Science Foundation, \$141,000 (September 1980 - August 1982).
"Collisions of Ions with Highly Excited Atoms."

National Science Foundation, \$221,000 (September 1982 - August 1985).
"Collisions of Ions with Highly Excited Atoms."

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National Science Foundation, \$325,000 (September 1985 - August 1988)
“Interaction of Rydberg Atoms with Charged Particles and Fields.”

National Science Foundation, \$464,329 (September 1988 - February 1992)
“Interaction of Rydberg Atoms with Charged Particles and Fields.”

National Science Foundation, \$410,600 (March 1992 - Sept. 1996)
“Interaction of Rydberg Atoms with Charged Particles and Fields.”

National Science Foundation, \$15,450 (May 1992 - October 1996)
“Collisions of Ions with Circular-State Rydberg Atoms”, a research collaboration between U. Kentucky and the Institute of Physics and Astronomy, University of Aarhus, Denmark.

National Science Foundation, \$223,684 (August 1994 - July 1999)
(Includes matching by U. Kentucky) “Acquisition of Laser Equipment for Research in Collisions, Population Transfer and Control in Highly Excited Atoms”, Office of Science and Technology Infrastructure.

Research Opportunity Award, Research Corporation, \$30,000 (May 1996)
“Collisions of Ions with Rydberg Atoms in Coherent Elliptic States.”

National Science Foundation, \$335,070 (August 1997 - July 2000)
“Collisions of Rydberg Atoms with Charged Particles.”

National Science Foundation, \$618,000 (June 2000 - May 2005)
“Electron-Rydberg Collisions at eV and Sub-eV Energies.” Co-PI: M.J. Cavagnero.

U.S. Civilian Research and Development Foundation, \$60,500 (July 2002 - June 2004)
“High-precision microwave spectroscopy of quantum defects in Rydberg states of Au and Al atoms”, a research collaboration between U. Kentucky and Kharkov National University by V.N. Karazine, Kharkov, Ukraine. Co-PI: V.A. Efremov.

National Science Foundation, \$373,796 (July 2006 - June 2009)
“(e,2e) and laser assisted electron impact studies of helium ionization.” PI: N.L.S. Martin, Co-PI: K.B. MacAdam.

U.S. Civilian Research and Development Foundation, \$46,000 (\$7,280 to UK) (Feb. 2007 - Feb. 2009) “High-precision microwave spectroscopy of Cu, Ag and Au atoms in $l = 0$ to 3 Rydberg states: Energy levels, fine structure, quantum defects and ionization potentials”, a research collaboration between U. Kentucky and Kharkiv State University, Kharkiv, Ukraine. Co-PI: V.A. Efremov.

National Science Foundation, \$120,000/Yr 1 (July 2009 - June 2012)
“Out of scattering plane (e,2e) and laser assisted electron impact autoionization studies of helium.” PI: N.L.S. Martin, Co-PI: K.B. MacAdam.

Equipment grants from UK Major Research Equipment Fund: (various years)

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Equipment grants from UK Graduate School: (various years)

HONORS AND FELLOWSHIPS:

Phi Beta Kappa, 1965
Sigma Xi, 1965
Woodrow Wilson Fellow, 1965-66.
Frank Knox Memorial Traveling Fellow, Harvard University, 1971-72
NSF Energy-Related Postdoctoral Fellow, U. Arizona, 1976-77
University of Kentucky Research Professor, 1990-91
Visiting Fellow, Joint Institute for Laboratory Astrophysics, University of Colorado, Boulder, 1991-92
Visiting Scientist, U. Stockholm, Royal Swedish Academy of Sciences, Nobel Committees for Physics and Chemistry, July – December 2001, June 2002.
Visiting Scientist, Institute for Theoretical Atomic and Molecular Physics (ITAMP), Harvard University, February – March 2002
Honoree, naming of UK MacAdam Student Observatory, April 2008.
Inducted into College of Arts & Sciences Hall of Fame, Oct. 2014.

MEMBERSHIPS:

American Physical Society (Fellow)
Institute of Physics (London)

GRADUATE DEGREES AND POST-DOCTORALS MENTORED

D.B. Smith, Ph.D. 1986. Dissertation: “Orbital-Angular-Momentum Change in Sodium Rydberg Atoms Induced by Collisions with Slow Ions” [Dr. Smith is a scientific staff member at Oak Ridge National Laboratory.]

Xiaoyu Sun, Ph.D. 1991. Dissertation: “ l Change in Slow Collisions of Na^+ with $\text{Na}(nd)$ Rydberg Atoms” [Dr. Charles X. Sun is an Assoc. Professor at Medaille College, Buffalo NY.]

James C. Day, Ph.D. 1995. Dissertation: “Electron Capture from Aligned d -State Rydberg Atoms” [Dr. Day is Prof. of Physics at Transylvania U., Lexington KY.]

Dean M. Homan, Ph.D. 1997. Dissertation: “Electron Processes in Ion-Rydberg-Atom Collisions with Emphasis of Directed Linear Stark States” [Dr. Homan is Senior Research Scientist at Schlumberger Oilfield Service, Sugar Land, TX.]

Oleg P. Makarov, Ph.D. 1998. Dissertation: “Ionization of Rydberg Atoms by Slow Ions” [Dr. Makarov is employed at IPG Photonics Corp., Oxford MA]

Changsu Hwang, Ph.D. 2001. Dissertation: “Electron Capture from Aligned p -State Rydberg

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Atoms" [Dr. Hwang is an Assistant Prof. and Head of the Physics Dept. at the Korean Air Force Academy, Seoul, Korea.]

Carrie Creasey, M.S. 2002.

Volker Rieger, M.S. 1990. Thesis: "The Construction of a Trapped-Ion Source"

Dr. R.G. Rolfes, Postdoc 1978–1983. [Dr. Rolfes is Prof. of Physics at Transylvania U., Lexington KY.]

Dr. N.L.S. Martin, Postdoc 1984–1985. [Dr. Martin is Prof. of Physics, U. Kentucky.]

Dr. J. Singh, Postdoc 1986–1987.

Dr. L.G. Gray, Postdoc 1987–1993.

Dr. V.D. Irby, Postdoc 1993–1995. [Dr. Irby is employed at Cassiopeia Foundation, Mobile AL]

Dr. M.D. Ciocca, Postdoc 1997–1999. [Dr. Ciocca is Associate Prof. of Physics at Eastern Kentucky University.]

Dr. O.P. Makarov, Postdoc 1998–1999. [Dr. Makarov is employed at IPG Photonics Corp., Oxford MA]

Dr. Nagesha Kannadaguli, Postdoc 2000–2003. [Dr. Kannadaguli is an IT Specialist with the State of Washington Dept. of Ecology].

Dr. Hualin Zhang, Postdoc, 2000–2001. [Dr. Zhang is Radiation Physicist and Assistant Professor at Dept. of Radiation Medicine, The Ohio State University]

UNIVERSITY SERVICE (University of Kentucky)

Physics and Astronomy Departmental Committees (various terms):

- Alumni Development and Newsletter
- Building
- Colloquium (Chair)
- Department Council
- Departmental Self Study 1994-95
- Department Research Poster Session, organizer 2004-06
- Development/Newsletter 2006-07
- Faculty Selection Committees: AMO (Chair), Nuclear
- Futures Comm (2004-05)
- Graduate Program & Curriculum
- Honors and Awards (Chair)
- Library Policy
- Preliminary Exam (Chair)

Ph.D. Qualifying Exam
Promotion, Tenure and Merit Evaluation
Safety (Chair)
Shop Services (Chair)
Undergraduate Program & Curriculum
Organizer/Chair of Departmental Research Poster Sessions, 2004/05/06/07/08
Observatory

College of Arts and Sciences Committees:

Ad Hoc Committee on Priorities and Plans, 1982-83.
Advisory Committee for Math. and Natural Sciences
(promotion and tenure), 1986-88, 2003-05 (Chair)
Curriculum Committee for Natural Sciences Area, 1986-88.
Psychology Department Review Committee (Chair), 1987-88.
Chemistry Department Review Committee, 2002-03
A&S Executive Committee, 2005-08 (Chair 2007-08).
A&S Dean Search Committee (2008-09).

University-Wide Committees:

Major Research Equipment Committee, 1981.
Research Committee, 1982, 1986.
Research Equipment Bond-Issue Review Panel, 1987.
University and Community Advisory Committee for the Singletary Center for the
Arts (College of Fine Arts), 1988-91.
University of Kentucky Press Committee, 1988-91.
Academic Area Advisory Committee for Physical and Engineering Sciences
(promotion and tenure), 1988-90; 1996-97; Chair, 1989-90.
Advisory Committee for Selection of Chancellor - Lexington Campus, 1988-89.
Search Committee, Vice Chancellor for Research and Graduate Studies, 1991.
Research Scholars Program Committee, 1991.
University Research Professorship Committee, 1993-95.
University Forum/Professorship Committee, 1991-93.
Research Equipment Maintenance Committee, 1995-1999.
Laser Safety Subcommittee, UK Office of Radiation Safety, 1996-1998.
President's Initiative on Undergraduate Education at Kentucky's Comprehensive
Research University, 1998.
University Libraries External Review Committee, 2003.
University Comm. on Academic Planning and Priorities, Research Domain
Subcommittee Co-Chair, 2006-08

Other University Service and Activities:

Integrative Studies Seminars (participant).
UK Library Associates Executive Committee, 1986-90. President, 1988-89.
Speaker/Seminar Committee for the Opening of the W.T. Young Commonwealth
Library, 1997-98.

Vita: Keith B. MacAdam (contd.)

Conference Planning Group, Joint Meeting of National Society of Black Physicists and National Conference of Black Physics Students, UK March 1998.
UK Teaching & Learning Center Brown-Bag Lunch Discussions (participant).
Chancellor's Forum for Chairs, series organizer and presenter (1999).
Micro-Teach Leader, UK New Teaching Assistant Orientation (2003).
Posters at the Capitol 2004, Frankfort KY: Faculty mentor for undergraduate student research presentation by Matt Williams.
UK Research Committee proposal reviews
UK Graduate School: External Member of Doctoral Defense Examination Committees: College of Engineering, College of Fine Arts (various)
UK Fellows Society (James Kennedy Patterson Fellow, with Phyllis A. MacAdam)

PROFESSIONAL SERVICE:

General Committee, International Conference on the Physics of Electronic and Atomic Collisions (ICPEAC), 1981-85.
Southeastern Section (SES) APS Annual Meeting, Local Committee, 1982.
Steering Committee, International Seminar on Ion Atom Collisions (ISIAC), 1984-85.
International Advisory Committee (US representative), Oji International Seminar on Highly Excited States of Atoms and Molecules, 1984-86.
Reviewer of research proposals for NSF, USDoE, ARO-NRC, AFOSR, Research Corp., ACS-PRF, other funding authorities of universities, states and countries.
Manuscript referee for Phys. Rev. A, Phys. Rev. Lett., Am. J. Phys., Can. J. Phys., J. Phys. B, other international physics journals
APS - DAMOP Publication Committee, 1985-86, 1992-95 (Chair 1994-95).
APS - DAMOP Program Committee, 1990-93.
Physical Review A, Editorial Board member (atomic physics), 1991-93.
APS - DAMOP Executive Committee (Member At-Large), 1994-97.
APS - DAMOP Nominations Committee, 1997-99 (Chair 1997-98).
APS - Task Force to Review *Physical Review A*, 1991-96 (1996-97).
APS - DAMOP Ph.D. Thesis Award Committee (1999-2001).
NSF Committee of Visitors: Member of congressionally mandated unit review of National Science Foundation Division of Physics (Feb. 2000).
NSF AMO Physics Program, Proposal Review Panel, Nov. 2002-Jan. 2003, Nov. 2004-Jan. 2005
APS - DAMOP Fellowship Committee (2003-05)
APS - SESAPS, Beams Award Committee (2006-08, Chair 2007)
PhD Opponent, University of Bergen, Norway, May 2012
APS - Associate Editor, Physical Review A (2006-2015)