

# **VITAE OF ROBERT B. HALLOCK**

(most recent update 6/21/2012)

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## **•General Information:**

**Born: December, 1943; Citizen: United States**  
**Married: Norma; Children: 2 married sons**

### **Office:**

**Department of Physics**  
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**[this vitae](http://www-unix.oit.umass.edu/~rbhome/Vitae.htm)** (<http://www-unix.oit.umass.edu/~rbhome/Vitae.htm>)

**[brief biography](http://www-unix.oit.umass.edu/~rbhome/Biog.htm)** (<http://www-unix.oit.umass.edu/~rbhome/Biog.htm>)

**[avocation](http://www-unix.oit.umass.edu/~rbhome/draftmaster.htm)** (<http://www-unix.oit.umass.edu/~rbhome/draftmaster.htm>)

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## **•Note:**

**This Vitae begins with academic and scientific items related to Physics and near the end includes [Photography](#).**

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## **•Educational History:**

**1961 - 1965 = University of Massachusetts: B.S. (June 1965)**

**1965 - 1967 = Stanford University: M.S. (June 1967)**

**1967 - 1969 = Stanford University: Ph.D. (August 1969)**

**1969 - 1970 = Stanford University: Postdoctoral Research**

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### **● Academic Appointments:**

1970 - 1974 = Assistant Professor of Physics, Univ. of Mass.  
1971 = Visiting Scientist, Stanford University  
1974 - 1979 = Associate Professor of Physics, Univ. of Mass.  
1975 = Visiting Associate Professor, Brown University  
1977 - 1978 = Visiting Associate Professor, Cornell University  
1979 - now = Professor of Physics, Univ. of Mass.  
1985 - 1993 = Head, Department of Physics and Astronomy, Univ. of Mass.  
1985 - now = Adjunct Professor, Polymer Science and Engineering, Univ. of Mass.  
1999 = Acting Head (fall semester), Department of Physics and Astronomy  
2000 - 2001 = Interim Dean, College of Natural Sciences and Mathematics  
2001 - now = Distinguished Professor, University of Massachusetts

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### **● Recognition, Awards:**

1961 - 1964 = Phi Eta Sigma, Phi Kappa Phi, Sigma Xi, University of Massachusetts  
1963 - 1965 = National Science Foundation - Undergraduate Research /Univ. of Mass.  
1964 = Hasbrouck Scholarship Award, University of Massachusetts  
1965 = Charter Member, Phi Beta Kappa, University of Massachusetts Chapter  
1965 - 1966 = Woodrow Wilson Fellowship  
1969 - 1970 = AFOSR-National Research Council Fellowship  
1972 - 1976 = Alfred P. Sloan Research Fellow  
1974 = Faculty Research Fellowship, University of Massachusetts  
1975 = Finalist, Distinguished Teacher of the Year Competition  
1977 - 1978 = Fulbright-Hays Special Fellowship Award (England, declined)  
1982 = Fellow, American Physical Society  
1992 = Distinguished Faculty Lecturer, University of Massachusetts  
1992 = Chancellor's Medal, University of Massachusetts  
1992 - 1993 = J.S. Guggenheim Memorial Foundation Fellow  
1993 = Distinguished Faculty Research Fellowship Award, University of Massachusetts  
1998 = Distinguished Teacher of the Year Award, University of Massachusetts  
2001 = Distinguished Professor, University of Massachusetts  
2005 = Dean's Leadership Award, Natural Sciences and Mathematics, University of Massachusetts  
2008 = Distinguished Faculty Award, Presented by the Alumni Association, University of Massachusetts

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### **● Major Administrative or Service Responsibilities:**

1978 - now = Director, Laboratory for Low Temperature Physics, Univ. of Mass.  
1980 - 1982 = Chair, Departmental Personnel Committee

1980 - 1982 = University Research Council: Vice-Chair (1980-81), Chair (1981-82)  
1982 = Co-Chair Gordon Research Conference, Quantum Fluids and Solids  
1982 = Chair, Search Committee for Chancellor  
1985 - 1993 = Head, Department of Physics and Astronomy  
1987 = Chair, Committee to Evaluate the Dean of the College of Engineering  
1989 - 1992 = Chair, Low Temperature Advisory Group (national)  
1991 - 1993 = Chair, Science Day Committee (University)  
1993 - 1994 = Chair, Search Committee for Graduate School Dean  
1996 - 1997 = Co-Chair, Search Committee for Provost  
1997 - 1999 = Chair, College of Natural Sciences and Mathematics Personnel Committee  
1999 = Acting Head (fall semester), Department of Physics and Astronomy  
1999 - 2000 = Chair, Principal Investigator Removal Hearing Panel  
2000 - 2001 = Interim Dean, College of Natural Sciences and Mathematics

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### **Departmental Committee and Service Experience:**

1970 - 1974 = Undergraduate Advising, Chair 1972-74  
1971 - 1973 = Undergraduate Studies Committee  
1971 - 1974 = Ph. D. Qualifying Exam Committee  
1971 - 1975 = Activities Committee  
1972 = Undergraduate Curriculum Committee  
1972 - 1985 = Shops and Computers  
1975 - 1977 = Chair, Graduate Advising Committee  
1976 - 1980 = Graduate Studies Committee  
1978 - 1980 = Chair, Graduate Admissions Committee  
1980 - 1985 = Departmental Policy and Steering Committee  
1985 - 1993 = As Head, Active on Most Departmental Committees, Initiatives  
1986 - 1987 = Departmental Five Year Plan for Faculty Hiring, Future Directions  
1989 - 1990 = Physics Open House; Genesis of Science Day  
1994 - 1996 = Departmental Personnel Committee  
1994 - 1995 = Chair, Condensed Matter Five Year Plan  
1998 - 2000 = Member, Department Head's Advisory Committee  
1999 - 2000 = Chair, Condensed Matter Five Year Plan  
1999 - 2000 = Member, Graduate Studies Committee  
2001 - 2003 = Member, Graduate Admissions Committee  
2001 - now = Member, Department Head's Advisory Committee  
2001 - 2006 = Co-Chair, Colloquium Committee  
2002 = Chair, Search Committee for Head, Department of Physics  
2003 = Member, Physics Education Research - Recommendations Committee  
2003 - 2004 = Chair, Executive Search Committee  
2006 - now = Faculty Mentor  
2006 - 2008 = Chair, Endowed Gluckstern Professor Search Committee  
2006 - 2009 = Member, Departmental Personnel Committee and Subcommittee (Chair  
2008 - 2009)

2009 - now = Member, Shop Committee  
2010 - 2011 = Member, Graduate Admissions Committee  
2011 - now = Undergraduate Advisor (Freshman 2011 - 12, and continuing)

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**University Committee and Service Experience:**

1973 - 1976 = Faculty Senate Computer Committee  
1980 - 1982 = University Research Council, Chair 1981-82  
1982 = Chair, Search Committee for Chancellor  
1984 - 1985 = College of Natural Sciences and Math Personnel Committee  
1985 - 1986 = Member Supercomputer Committee  
1985 - 1986 = Member, FCRAO (observatory) Policy Board  
1986 - 1987 = Organizer, Commonwealth Lecture Series  
1986 - 1987 = Chair, Evaluation of the Dean of Engineering  
1987 - 1988 = Member, Health Sciences Reorganization Committee  
1987 - 1988 = Member, Chancellor's Commission on Graduate Education  
1987 - 1990 = Development Office Advisory Committee  
1989 - 1990 = National Campaign Chairman, Annual Fund  
1989 - 1991 = NETPIC Committee for Campus Broadband Network  
1990 - 1991 = Member, Search Committee for Head of Mathematics  
1990 - 1991 = Materials Research Laboratory, Site Review Presenter  
1990 - 1992 = Chair, Science Day Committee, and Lecturer  
1991 - now = Member and convener, ad hoc Faculty Advisory Committee, "The Group"  
1992 - 1993 = Member, Provost's Working Group on VC Research and Graduate School  
1993 - 2000 = Science Days Lecturer, "A Trip Toward Absolute Zero"  
1993 - 1995 = Member, Chancellor's Task Force on Research and Graduate Education  
1993 - 1994 = Chair, Search Committee for Graduate School Dean  
1995 - 1995 = Member, Materials Research Initiative Committee  
1996 - 1999 = Member, Advisory Board, University of Massachusetts Press  
1996 - 1997 = Co-Chair, Search Committee for Provost  
1996 - 1999 = Member, College of Nat. Sci. and Math. Personnel Committee, (Chair, 1997-99)  
1998 - 1999 = Member, campus-wide Faculty Committee on Post-Tenure Review  
1998 - 1999 = Member, Provost's Ad-hoc Committee on the Campus Research Agenda  
1999 - 2001 = Member, Provost's Research Advisory Working Group  
1999 - now = Faculty Advisor, Center for Teaching  
2000 - 2001 = Member, Search Committee for Vice Chancellor for Research  
2001 - 2002 = Mentor, Lilly Teaching Fellow Program  
2002 - 2009 = Chair, College of Nat. Sci. and Math. Distinguished/Chaired Prof. Committee  
2002 - 2002 = Co-Chair, Mass. Academy of Sciences Exploration Committee  
2002 - 2003 = Member, Search Committee for Vice Chancellor for Research  
2003 = Member, Search Committee for Head, Polymer Science and Engineering  
2005 - 2006 = Member, Provost's Committee for Annual Campus-wide Convocation  
2006 - 2007 = Member, Joint Administration/MSP Committee on Add/Comp

2007 - 2008 = Chair, Committee to Evaluate the Dean of the School of Nursing  
2008 - 2008 = Member, Search Committee, Dean of the School of Nursing  
2009 = Member, Provost's RFP Review Committee  
2009 = Member, Search Committee for Head, Department of Geosciences  
2009 - now = Chair, College of Natural Sciences Distinguished/Chaired Prof. Committee  
2009 - now = Member, Conflict of Interest Committee, University of Massachusetts System  
2010 - 2011 = Member, Search Committee for Chair, Department of Computer and Information Science  
2010 - 2012 = Member, Search Committee for Dean, College of Engineering  
2011 - now = Member, Graduate Program Review Committee, University-wide  
2012 - now = Member, College of Natural Sciences Personnel Committee  
2012 - now = Chair, College of Natural Sciences Committee for the Performance Evaluation of the Dean

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#### **• Significant Five College Committee and Service Experience:**

1985 - 1986 = Advanced Lab Proposal Committee  
1985 - 1987 = Committee on Consortium Cooperation, Conference  
1989 - 1992 = Physics Chairs Committee  
1989 - 1992 = Advanced Physics Laboratory Committee  
1990 - 1991 = Undergraduate Education Committee  
1990 - 1992 = "Growing Without Growing" Committee  
1991 - 1992 = PEW Proposal Drafting Committee  
1993 - 1998 = Co-Chair, Committee on Course Development in Symbolic and Pictographic Reasoning  
1996 = Member, Search Committee for Development Officer  
1997 = Presenter, Workshop on Cooperative Developments

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#### **• Selected Other Committee and Service Experience:**

1985 - 1986 = Organizer, Boston Museum of Science Seminar Series  
1986 - 1987 = Organizer, new Annual Conference Series of Heads  
1986 - 1988 = Steering Committee, National Department Heads Meeting  
1986 - 1988 = Member, Executive Committee, New England Section, APS  
1987 - 1990 = Panelist, NSF Presidential Young Investigator Selection  
1987 - 1997 = NAS/NRC Postdoctoral Selection Panel Member  
1987 - 1993 = Member, New England Heads Conference  
1989 - 1990 = Organizer, Community Meeting on Funding, APS meeting  
1989 - 1992 = Chair, LTAG, national elected position  
1989 - 1996 = Member, Research Corporation, Grants Advisory Board  
1991 - 1993 = Member, Midwest Physics Chairs Conference  
1991 - 1993 = Program Advisory Committee, LT20 International Conference

**1991 - 1993 = Organizing Committee, LT20 International Conference**  
**1991 - 1992 = NASA Advisory Panel for Low Temperature Physics in Space**  
**1993 - 1996 = NASA Low Temperature Science Steering Group**  
**1993 - 1995 = Member, Selection Committee for the Buckley Prize, APS**  
**1993 - 1998 = Member, Visiting Committee, Lawrence University**  
**1994 - 1995 = Member, Intl. Advisory Committee, SQFAS (Cornell - 1995)**  
**1996 - 1997 = Member, Intl. Advisory Committee, QFS (Paris - 1997)**  
**1996 - 1998 = Chair, QFS98 International Conference (UMass - June 1998)**  
**1996 - 1997 = Member, NASA Fundamental Physics Steering Group**  
**1997 - 1997 = Member, Evaluation Committee, The Council for Undergraduate Research**  
**1997 - 2001 = Member, Fundamental Physics Discipline Working Group (NASA)**  
**1997 - 1998 = Member, CMGR Subcommittee of Space Studies Board (NASA)**  
**1998 - now = Member, Steering Committee, QFS Conference Series, Chairman (1998-2000)**  
**1998 - 1999 = Member, International Advisory Board, LT22 International Conference**  
**1999 - 2000 = Member, Organizing Committee, QFS 2000 (Minneapolis - June 2000)**  
**2000 - 2003 = Member, Board of Directors, Mass Ventures Corporation**  
**2000 - 2001 = Member, Steering Committee, The Environmental Institute**  
**2000 - 2001 = Member, Organizing Committee, QFS 2001 (Konstanz - July 2001)**  
**2001 - 2003 = Member, Finance Committee, Mass Ventures Corporation**  
**2001 - 2002 = Member, Visiting Committee, Univ. of Richmond**  
**2003 = Member, External Organizing Committee, QFS 2003 (Albuquerque - August 2003)**  
**2003 - now = Member, Board of Directors, Research Corporation**  
**2003 - now = Member, Science Advancement Committee, Research Corporation (Chair, 2010 - now)**  
**2003 - 2004 = Member, Search Committee for President, Research Corporation**  
**2003 - 2004 = Member, External Organizing Committee, QFS 2004 (Trento - July 2004)**  
**2004 - 2005 = Member, National Advisory Committee, LT24 International Conference**  
**2004 - 2005 = Member, International Advisory Committee, Ultra Low Temperature Conference, ULT2005.**  
**2005 = Member, External Advisory Committee, Hendrix College**  
**2005 - 2008 = Member and Secretary, IUPAP-C5, representing the United States**  
**2005 - 2007 = Chair, Strategic Planning Task Force, Research Corporation**  
**2005 - 2006 = Member, International Program Advisory Committee QFS 2006 (Kyoto - August 2006)**  
**2006 - now = Member, U.S. Liason Committee for IUPAP**  
**2006 - 2009 = Member, Audit Committee, Research Corporation**  
**2006 - 2007 = Member, Advisory Committee QFS 2007 (Kazan - August 2007)**  
**2007 - 2008 = Member, Advisory Board LT25 (Amsterdam - August 2008)**  
**2007 - 2008 = Member, International Advisory Committee, ULT 2008 (London - August 2008)**  
**2008 - 2011 = Chair, IUPAP-C5, representing the United States**  
**2008 - 2009 = Member, APS Committee to select recipient of the prize for Research at an Undergraduate Institution.**  
**2008 - 2010 = Chair, External Scientific Panel, Pacific Institute of Theoretical Physics**  
**2008 - 2009 = Member, International Advisory Committee, QFS 2009 (Chicago - August 2009)**

2009 - 2010 = Member, International Advisory Committee, QFS 2010 (Grenoble - August 2010)

2009 - now = Member, Governance and Nominating Committee, Research Corporation

2010 - 2011 = Member, Organizing Committee, LT26 (Beijing - August 2011)

2010 - 2011 = Chair, Selection Committee, IUPAP-C5 Young Investigator Award

2010 - 2011 = Member, Steering Committee, Supersolidity 2011 (New York - June 2011)

2010 - now = Member, Executive Committee, Research Corporation

2011 - now = Member, IUPAP-C5, (past Chair), representing the United States

2012 - now = Member, Program Committee, QFS 2013 (Matsue, Japan)

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### ● Research Support:

Research program support since 1972. Current support:

National Science Foundation - Support for research in experimental Low Temperature Physics, primarily in the area of liquid and solid helium.

CUMIRP (Polmer Science) - Support for the exploration of low temperature techniques to characterize surface roughness.

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### ● Research Program Profile:

The research group typically includes 2 - 3 graduate students, occasionally one postdoctoral research associate, often an undergraduate and sometimes a high school student. To date 33 graduate students have completed Ph.D. dissertations in the group; 17 postdocs have completed work in the group. Most of the student dissertations have involved research in the general area of liquid helium films, superfluidity and two dimensional phase transitions; two have involved superconductivity and two have involved macromolecular adsorption. In 2012 the group is smaller than usual and consists of one undergraduate, one postdoc, and will likely include one graduate student who is expected to join the group in summer 2012.

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### ● Teaching Experience; Conferences, Abstracts and Talks:

A list of [classroom teaching](http://www-unix.oit.umass.edu/~rbhome/teach2.htm) (<http://www-unix.oit.umass.edu/~rbhome/teach2.htm>) experience, [invited talks](http://www-unix.oit.umass.edu/~rbhome/Invited.htm) (<http://www-unix.oit.umass.edu/~rbhome/Invited.htm>), conferences attended, and published abstracts and book reviews is available through a web link if underlined.

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## ● Graduate Students Supervised and Postdoctoral Colleagues:

A list of 33 [graduate students](http://www-unix.oit.umass.edu/~rbhome/Students.htm) supervised (<http://www-unix.oit.umass.edu/~rbhome/Students.htm>), and 18 [postdoctoral colleagues](http://www-unix.oit.umass.edu/~rbhome/Postdoc.htm) (<http://www-unix.oit.umass.edu/~rbhome/Postdoc.htm>) is available through web link.

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## ● Physics Publications:

### ● Books:

1. **Superfluid Helium: Selected Reprints, Edited by R.B. Hallock (American Institute of Physics, N.Y.), 1983.**

### ● Books under Development (not yet submitted for publication):

2. **The Helium Film, R.B. Hallock (in preparation).**

3. **Low Temperature Physics, A.L. Fetter and R.B. Hallock (title expected to change, very slowly in preparation).**

### ● Book Chapters:

1. **"The Properties of Multilayer  $^3\text{He}$  -  $^4\text{He}$  Mixture Films", Prog. Low Temp. Phys., ed. W.P. Halperin, (North Holland, Amsterdam), vol. XIV, ch. 5, 321-443, 1995.**

### ● Research Publications (including refereed conference publications):

1. **"Small Angle X-Ray Scattering from Liquid  $^3\text{He}$ ," (with N.P. Shah and W.A. Little), Proc. 10th Intl. Conf. on Low Temp. Phys., vol. IV, p. 322 (Moscow, 1966).**

2. **"Liquid Structure Factor of  $^4\text{He}$  by X-Ray Scattering at Small Momentum Transfer," Phys. Rev. Letters 23, 830 (1969).**

3. **"An Inexpensive Target Cell for the Study of Liquids and Gases by X-Ray Scattering," Rev. Sci. Instrum. 41, 1107 (1970).**

4. **"X-Ray Scattering from Liquid  $^3\text{He}$  and Gaseous  $^3\text{He}$  and  $^4\text{He}$ ," {Proc. 12th Intl. Conf. on Low Temp. Phys.}, Vol. 1, p. 159 (Kyoto, 1970). (Published March 1971).**

5. **"Small Momentum Transfer Structure Factor of Quantum Liquids," Phys. Rev. Letters 26, 618 (1971).**

6. **"X-Ray Scattering from Liquid  $^4\text{He}$ ," Phys. Rev. A5, 320 (1972).**



7. "Liquid Structure Factor Measurements of  $^3\text{He}$ ," J. Low Temp. Phys. 9, 109 (1972).
8. "Alloys for Fabricating Apertures for  $\text{CuK}\alpha$  X-Ray Experiments," Rev. Sci. Instrum. 43, 1703 (1972).
9. "A Bellows Seal Superfluid Valve," Rev. Sci. Instrum. 43, 1713 (1972).
10. "Static Structure Factor of Gaseous  $^4\text{He}$ ," Physics Letters 43A, 445 (1973).
11. "A Superfluid-Tight Coaxial Coupling" (with E.B. Flint), Rev. Sci. Instrum. 44, 1133 (1973).
12. "Graduate Support Surveyed," Physics Today (December 1973).
13. "Quasi-Isothermal Superfluid Film Oscillations" (with E.B. Flint), Physics Letters **45A**, 245 (1973).
14. "X-Ray Scattering from Gaseous  $^3\text{He}$  and  $^4\text{He}$  at Small Momentum Transfer," Phys. Rev. A8, 2143 (1973).
15. "Neutron Scattering and the Dispersion Relation in He II at Small Momentum Transfer," Phys. Rev. A8, 3244 (1973).
16. "Observations of Temperature Oscillations in 'Quasi-Isothermal' Superfluid Film Oscillations" (with E.B. Flint), Phys. Rev. Letters 31, 1383 (1973).
17. "Experimental Test of a New Mechanism of Dissipation in Accelerated Superfluid Film Flow" (with E.B. Flint), Phys. Letters A47, 417 (1974).
18. "The Functional Forms of  $S(k)$  and  $E(k)$  in He II as Determined by Scattering Experiments," {Proc. 13th Intl. Conf. on Low Temp. Phys.} Vol. 1, p. 551 (1974).
19. "Liquid Structure Factor Measurements on Quantum Fluids," {Proc. 13th Intl. Conf. on Low Temp. Phys.}, Vol. 1, p. 547 (1974).
20. "Quasi-Isothermal Superfluid Film Flow: Oscillations Between Two Reservoirs" (with E.B. Flint), Phys. Rev. A10, 1285 (1974).
21. "Observation of Persistent Currents in a Saturated Superfluid Film" (with R.K. Galkiewicz), Phys. Rev. Letters 33, 1073 (1974).
22. "A Procedure for Producing Smooth Bore Holes in Copper Cylinders" (with E.B. Flint), Rev. Sci. Instrum. 46, 100 (1975).
23. "Film Thinning in He II at Temperatures above 1.1K" (with E.B. Flint), Phys. Rev. B11, 2062 (1975).

24. "Experiments with Persistent Currents in Saturated Films of Superfluid Helium" (with R.K. Galkiewicz), {Proc. 14th Intl. Conf. on Low Temp. Phys.}, Vol. 1, p. 407 (1975).
25. "Third Sound Resonances and Evidence for Macroscopic Mass Flow in Saturated Film Persistent Current Experiments" (with R.K. Galkiewicz and K.L. Telschow) {Proc. of the 14th Intl. Conf. on Low Temp. Phys.}, Vol. 1, p. 415 (1975).
26. "Oscillatory Superfluid Film Thinning in the Presence of a Bias Current," Phys. Lett. 51A, 457 (1975).
27. "Film Thickness Determinations in Moving Saturated Superfluid 4He Films," {it Quantum Statistics and the Many Body Problem}, ed. S.B. Trickey et al. (Plenum, New York, 1975), p. 185.
28. "Stability of Persistent Currents in Unsaturated Superfluid 4He Films" (with K.L. Telschow), Phys. Rev. Letters 37, 1484 (1976).
29. "Experiments on the Attenuation of Third Sound in Saturated Superfluid Helium Films" (with K.L. Telschow and R.K. Galkiewicz), Phys. Rev. B14, 4883 (1976).
30. "The Liquid Gas Interface in Helium Near Its Critical Point" (with J.A. Northby), {it Quantum Fluids in Space}, ed. R.J. Donnelly and P. Kittel (U. Oregon, 1976), p. 16.
31. "Persistent Currents in Saturated Superfluid 4He Films on Rough Surfaces in the Presence of Third Sound Resonances" (with R.K. Galiewicz and K.L. Telschow), J. Low Temp. Phys. 26, 147 (1977).
32. "Saturated Superfluid 4He Film Flow: Characteristic Oscillations Induced by Persistent Circulation" (with R.K. Galkiewicz), Phys. Rev. B15, 2671 (1977).
33. "Graduate Support Re-surveyed" (Guest Commentary), {Physics Today} (May 1977).
34. "The Decay of Persistent Currents in Unsaturated Superfluid 4He Films" (with K.L. Telschow and D.T. Ekholm), {it Quantum Fluids and Solids}, ed. S.B. Trickey et al. (Plenum, New York, 1977) p. 421.
35. "Damping of Two-Reservoir Superfluid 4He Film Oscillations below 1K" (with J.S. Brooks), Phys. Lett. A63, 319 (1977).
36. "Thermal Diffusivity Measurements in Liquid Helium by Rayleigh Light Scattering" (with E.A. Lazarus, N.G. Ford, Jr. and K.H. Langley), J. Low Temp. Phys. 29, 431 (1977).
37. "Small Momentum Transfer Measurements of  $S(k)$  in 4He at  $T = 4.27$  K as a Function of Density" (with B.L. Weiss and H.N. Robkoff), Phys. Lett. A 64, 400 (1978).

38. "Fluid Structure Factor Measurements in 4He at  $T = 10$  K" (with B.L. Weiss and H.N. Robkoff), *J. de Phys.* 39, C6-217 (1978).
39. "Observation of the Complete Decay of Persistent Currents in Unsaturated Superfluid  $^4\text{He}$  Films" (with D.T. Ekholm), *J. de Phys.* 39, C6-307 (1978).
40. "Third Sound Measurements in 3He-4He Mixtures Using Time of Flight Techniques" (with J.S. Brooks), *J. de Phys.* 39, C6-314 (1978).
41. "Direct Observation of Pulsed Third Sound Mass Displacement Waves in Unsaturated Superfluid 4He Films" (with J.S. Brooks and F.M. Ellis), *Phys. Rev. Letters* 40, 240 (1978).
42. "The Behavior of Persistent Currents Under Conditions of Strong Decay, (with D.T. Ekholm), *Phys. Rev. Letters* 42, 499 (1979).
43. "Film Thinning in Unsaturated Superfluid 4He Films During Persistent Flow" (with D.T. Ekholm), *Phys. Rev.* B19, 2485 (1979).
44. "Liquid Structure Factor" in *{\it Proceedings of the 4th Oregon Helium Conference}*, U. Oregon Press, 1979.
45. "Thinning of Saturated Superfluid 4He Films During Critical and Sub-critical Flow" (with F.J. Kehayias), *Phys. Letters* 74A, 337 (1979).
46. "Temperature Dependent Spatial Order in Superfluid and Normal 4He" (with H.N. Robkoff and D.A. Ewen), *Phys. Rev. Letters* 43, 2006 (1979).
47. "Fluid Structure Factor Measurements in 4He for  $5.5 \leq T \leq 7.0\text{K}$ " (with D.A. Ewen and H.N. Robkoff), *Phys. Rev.* B21, 3929 (1980).
48. "Studies of the Decay of Persistent Currents in Unsaturated Films of Superfluid 4He" (with D.T. Ekholm), *Phys. Rev.* B21, 3902 (1980).
49. "Third Sound and the Decay of Persistent Currents in Unsaturated 3He-4He Films" (with D.T. Ekholm), *Phys. Rev.* B21, 3913 (1980).
50. "Superflow Onset: 4He on Grafoil" (with J. Maps), *{\it Ordering in Two Dimensions}*, ed. S.K. Sinha (North Holland, New York, 1980) p. 271.
51. "Superfluid Onset in 3He-4He Mixture Films" (with F.M. Ellis and J.S. Brooks), *{\it Ordering in Two Dimensions}*, ed. S.K. Sinha (North Holland, New York, 1980) p. 275.
52. "Windows for X-Ray Diffraction Experiments" (with D.A. Ewen and F.W. Wirth), *Rev. Sci. Instrum.* 52, 134 (1981).

53. "Thickness Measurements of Unsaturated Superfluid  $^4\text{He}$  films Under Driven and Persistent Flow" (with D.T. Ekholm). *J. Low Temp. Phys.* 42, 339 (1981).
54. "An X-Ray Diffractometer for Use With Cryogenic Fluid Targets" (with H.N. Robkoff and B.L. Weiss) *Rev. Sci. Instrum.* 52, 1037 (1981).
55. "Structure Factor Measurements in  $^4\text{He}$  at Saturated Vapor Pressure for  $1.3 \leq T \leq 4.24 \text{ K}$ " (with H.N. Robkoff), *Phys. Rev. B* 24, 159 (1981).
56. "Phase Separation in  $^3\text{He}$ - $^4\text{He}$  Mixture Films" (with F.M. Ellis, M.D. Miller, and R.A. Guyer), *Phys. Rev. Letters* 46, 146 (1981).
57. "Capacitive Transient Detector of High Sensitivity" (with F.M. Ellis and J.S. Brooks), *Rev. Sci. Instrum.* 52, 1051 (1981).
58. "Onset of Superfluid Flow in  $^4\text{He}$  Films Adsorbed on Mylar" (with J. Maps) *Phys. Rev. Letters* 47, 1533 (1981).
59. "Phase Separation in Superfluid  $^3\text{He}$ - $^4\text{He}$  Mixture Films" (with F.M. Ellis) *Physica B+C* 107B, 35 (1981).
60. "Thermal Conductance Measurements in Helium Films on a Mylar Substrate" (with J. Maps) *Physica B+C* 107B, 399 (1981).
61. "X-Ray Scattering from Liquid Helium," *Physica B+C* 109+110B, 1557 (1982).
62. "Resource Letter SH-1-Superfluid Helium", *Am. J. Phys.* 50, 202 (1982).
63. "Structure Factor Measurements in  $^4\text{He}$  as a Function of Density" (with H.N. Robkoff), *Phys. Rev. B* 25, 1572 (1982).
64. "Thermal Transport on the Superfluid Side of the Kosterlitz-Thouless Transition in  $^4\text{He}$  Films" (with J. Maps), *Phys. Rev. B* 26, 3979 (1982).
65. "Observations on  $^4\text{He}$  Persistent Flow" (with K.L. Telschow) *Phys. Rev. B* 27, 3068 (1983).
66. "Experimental Study of the Kosterlitz-Thouless Transition in  $^4\text{He}$  Films" (with J. Maps.), *Phys. Rev. B* 27, 5491 (1983).
67. "Spatial Structure Changes in  $^4\text{He}$  at Fixed Density as a Function of Temperature" (with F.W. Wirth and D.A. Ewen), *Phys. Rev. B* 27, 5530 (1983).
68. "High Resolution Third Sound Resonator" (with F.M. Ellis) *Rev. Sci. Instrum.* 54, 751 (1983).

69. "A Simple Apparatus for Concentration Determinations in Binary Gas Mixtures" (with J.S. Brooks) *Rev. Sci. Instrum.* **54**, 1199 (1983).
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207. "Visual Observations of Disordered Solid Helium" (with N.C. Ford, Jr. and K.H. Langley), *J. Low Temp. Phys.* 148, 653 (2007).
208. "Al/Au Bilayer Thermometer for Third Sound Detection" (with J.D. Cummings), *J. Low Temp. Phys.* 148, 893 (2007).
209. "Pulsed Third Sound in the Presence of a Superflow" (with D.R. Luhman), *J. Low Temp. Phys.* 148, 541 (2007).
210. "Measurements of Third Sound Attenuation at  $T = 1.35$  K" (with D.R. Luhman), *J. Low Temp. Phys.* 148, 535 (2007).
211. "Unexpected Mass Decoupling for 3He - 4He Films on a Solid Hydrogen Substrate" (with P.T. Finley and P.S. Ebey), *Phys. Rev. Letters* 98, 265301 (2007).
212. "Observation of Unusual Mass Transport in Solid hcp 4He" (with M.W. Ray), *Phys. Rev. Letters* 100, 235301 (2008).
213. "The Critical Temperature and Reproducibility of Al/Au Bilayer Thermometers Fabricated with Different Al/Au Thickness Ratios by Vacuum Evaporation Techniques" (with J.D. Cummings), *J. Low Temp. Phys.* 153, 35 (2008).
214. "Observation of Mass Flux Through hcp 4He off the melting Curve" (with M.W. Ray), *Journal of Physics: Conference Series* 150, 032087 (2009).
215. "Growth of Solid hcp 4He from the Superfluid" (with M.W. Ray), *Journal of Physics: Conference Series* 150, 032088 (2009).

216. "New Developments in Low Temperature Physics" (with M. Paalanen), *Journal of Physics: Conference Series* 150, 001003 (2009).
217. "Study of the Effect of Initial Conditions on the Scaling Properties of CaF<sub>2</sub> Thin Films" (with K.J. Thompson and D.R. Luhman), *Surface Science* 603, 3249 (2009).
218. "Observation of Mass Transport through Solid 4He" (with M.W. Ray), *Phys. Rev. B* 79, 224302 (2009).
219. "Mass Flow through Solid 4He" (with M.W. Ray), *J. Low Temp. Phys.* 158, 560 (2010); Erratum (typo correction) 158, 734 (2010).
220. "Growth of Solid hcp 4He from the Superfluid" (with M.W. Ray), *Phys. Rev. B* 81, 214523 (2010).
221. "Experiments with Solid 4He", *Physica A* 389, 2894 (2010).
222. "Observation of Thermomechanical Equilibration in the Presence of a Solid 4He Conduit", (with M.W. Ray), *Phys. Rev. B* 82, 012502 (2010).
223. "Isochoric Compressibility of Solid 4He" (with M.W. Ray), *J. Low Temp. Phys.* 162, 427 (2011).
224. "Mass Flux through a Cell Filled with Solid 4He Induced by the Thermo-mechanical Effect" (with M.W. Ray), *J. Low Temp. Phys.* 162, 421 (2011).
225. "Mass Flux and Solid Growth in Solid 4He for 60 mK - 700 mK" (with M.W. Ray), *Phys. Rev. Letters* 105, 145301 (2010).
226. "Gas Adsorption on single-wall Carbon Nanotube Bundles and Charcoal Samples" (with Y.H. Kahng and E. Dujardin), *Phys. Rev. B* 83, 115434 (2011).
227. "Mass Flow through Solid 4He Induced by the Fountain Effect" (with M.W. Ray) *Phys. Rev. B* 84, 144512 (2011).
228. "Temperature Dependence of Helium Diffusion through Common Epoxies" (with D.J. Lovinger) *Journal of Physics: Conference Series* (accepted).
229. "Mass Flux through Solid 4He Induced by Chemical Potential Differences" *Journal of Physics: Conference Series* (accepted).
230. "Mass Flux Characteristics in Solid 4He for  $T > 100$  mK: Evidence for Bosonic Luttinger Liquid Behavior" (with Ye. Vekhov) *Phys. Rev. Letters* (submitted).
231. "A Summary of Mass Flux Measurements in Solid 4He" (with M.W. Ray and Ye. Vekhov) *J. Low Temp. Physics* (submitted).

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## **● Photography**

### **● Photography Education (other than self-taught):**

- 1994 = Darkroom Course, Photography I, Univ. of Mass.**
- 2000 = Workshop (4 days) with John Marcy**
- 2002 = Workshop (1 day) with Ron Rosenstock**
- 2002 = Workshop (5 days) with Bruce Barnbaum and Don Kirby**
- 2004 = Workshop (Advanced) (5 days) with Bruce Barnbaum**
- 2005 = Workshop (5 days) with John Sexton and Anne Larson**
- 2007 = Workshop (Advanced) (5 days) with John Sexton and Anne Larson**

### **● Exhibitions:**

- 2002 = Alfredo's Photographic Gallery, Amherst, MA - two artists**
- 2003 - 2010 = Baystate Gallery, Springfield MA (2003, 2005, 2008, 2009, 2010) - six artists for each exhibition**
- 2004 = Valley Photographic Center, Springfield MA - multi artist**
- 2005 = View Camera National Conference Exhibit, Valley Photo Center - multi artist**
- 2006 = Alfredo's Photographic Gallery, Northampton MA - solo - "Moments in New England and Beyond"**
- 2006 = Fish and Wildlife Gallery, Hadley MA - solo - "New England Impressions"**
- 2006 = Nashawannuck Gallery, Easthampton, MA - multi artist**
- 2007 = Burnett Gallery, Jones Library, Amherst MA - solo - "What do You See?"**
- 2007 = Museum of Fine Arts, Community Gallery, Springfield MA - solo - "Explorations"**
- 2008 = Hosmer Gallery, Forbes Library, Northampton MA - solo - "Observations, Near and Far"**
- 2008 = Massachusetts State House, Offices of Senator Rosenberg, Boston MA - multi artist**
- 2009 = Discovery Center, Turners Falls MA - solo - "Observations and Discoveries"**
- 2009 = Summit House, South Hadley, MA - multi artist - "Hadley 350th Photo Exhibit"**
- 2010 = The Gallery at Hallmark, Turners Falls MA - multi artist - "Art + Space: Collected Work from Local Artists"**
- 2010 = Northampton Cooperative Bank Gallery, Amherst MA (March and April, 2010) - solo - "Black and White Images - Literal and Abstract"**
- 2010 = Leverett Library Gallery, Leverett MA (May and June, 2010) - solo - "Mostly Close to Home"**
- 2010 = Franklin Hospital, Greenfield MA (September and October, 2010) - solo - untitled**
- 2010 = Inaugural Franklin County Biennial - multi artist - "Confluence" at The Gallery at Hallmark, Turners Falls, MA, October 2010**
- 2011 = Hillside Salon, University of Massachusetts, Amherst, MA (March 2011).**
- 2011 = ECA Gallery, Easthampton, MA (June 2011) - solo - "Coming Home"**
- 2011 = Valley Photographic Center, Springfield, MA (November 2011) - multi artist**



2012 = Amherst Biennial, Amherst Town Hall, Amherst, MA (August - September 2012) - multi artist

### ● Presentations:

2005 = Co-curator and co-presenter for Gallery Talk, "Quicker than a Wink", Photographs by Harold Edgerton, Mead Art Museum, Amherst College, Amherst MA

2006 = Presenter, "What's with Color: Some Science and our Perception", Meditech, Westwood, MA

2007 = Co-presenter and co-organizer, Symposium: "Light and Color in Science and Art", University of Massachusetts, Amherst MA

2009 = Presenter, "Observations and Discoveries", Gallery Talk, Discovery Center, Turners Falls, MA

2010 = Co-presenter and Gallery Conversation, "The Inner Beauty of Flowers", along with the educational text panels and exhibition, co-created, The Church Exhibition Gallery, Botanic Garden of Smith College, Northampton, MA

2010 = Presenter, "The Art and Science of Light and Color", Greenfield Community College Senior Symposium, Greenfield, MA

2011 - 2012 = Presenter, "Light, Color and Sharpness: Science, Art, Our Perception and some Practical Things", a series of four presentations, Pioneer Valley Photographic Artists, Belchertown, MA

2012 = Presenter, "Effective Flower Photography: Some Suggestions", Amherst Garden Club, Amherst, MA

### ● Photography Web Page:

[present web page](http://www-unix.oit.umass.edu/~rbhome/draftmaster.htm) (update in progress) (<http://www-unix.oit.umass.edu/~rbhome/draftmaster.htm>)

### ● Photography Publications:

1. "Bellows-Extension Exposure Factor: Getting the Right Exposure Using a Field-Ready Reference Graph", *Photo Techniques*, Vol. 27, #1, 19 (2006); Preston Publications, Niles, IL.

2. "How to Optimize the Sharpness of your Photographic Prints: Part I - Your Eye and its Ability to Resolve Fine Detail", *View Camera*, July/August, 2006, p.50.

3. "How to Optimize the Sharpness of your Photographic Prints: Part II - Practical Limits to Sharpness in Photography and a Useful chart to Determine the Optimal f-stop", *View Camera*, September/October, 2006, p. 54.

### ● Book under Development (not yet submitted for publication):

1. "The Science of Light: What Artists and Photographers Need to Know" (in preparation).

• **Service:**

**2005-2007 = Secretary, Pioneer Valley Photographic Artists**

**2007-2009 = President, Pioneer Valley Photographic Artists**

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