# HOWARD A. BLACKSTEAD

**PROFESSOR OF PHYSICS** **AT NOTRE DAME SINCE 1969**

**BORN**: February 24, 1940 **AT**: Minot, North Dakota

## Educational Background

North Dakota State University, B.S., 1962
Dartmouth College, M.A., 1964
Rice University, Ph.D., 1967

## Professional Experience

Research Associate with Professor C.P. Slichter, University of Illinois, 1967-69.
Assistant Professor of Physics, University of Notre Dame, 1969-75.
Summer Visiting Assistant Professor, Rice University, 1972.
Associate Professor of Physics, University of Notre Dame, 1975-1995.
Director of College of Science, Computer Systems, l984-1987
Professor of Physics, University of Notre Dame, 1995-present.

## Major Areas of Teaching and Research Interest

Rare-earth magnetism, microwave ultrasonics, liquid helium, scanning tunneling, microscopy/spectroscopy, high temperature superconductivity.

## Professional and Honor Societies

American Physical Society
Honorary Society, Society of the Sigma Xi
President of N.D. Chapter l984-85
Vice President, N.D. Chapter AAUP, 1984-85

## Research Interests and Professional Activities:

Rare-earth magnetism, microwave ultrasonics, liquid helium, and magnetic resonance
Design of four microprocessor systems
Author of a disk operating system and several specialized computer applications
Design of software and hardware for scanning tunneling microscopy
High Temperature Superconductivity
Scanning & Tunneling Microscopy

## Invited Talks

"Flux-Flow and Phase-Slip Dissipation in High Temperature Superconductors," seminar at Purdue University Department of Physics, Lafayette, Indiana, July 10, 1990.

"Flux-Flow and Phase-Slip Dissipation in High $T_c$ Superconducting Material," seminar at University of Illinois, August 7, 1990.

"Flux-Flow and Phase-Slip Dissipation in High $T_c$ Superconducting Material," seminar at Argonne National Laboratory, Argonne, Illinois, August 17, 1990.

"Residual Resistance in High-Temperature Superconductors," Physics Department Seminar, University of Wisconsin, Madison, Wisconsin, March 3, 1992.

"Microwave Dissipation in High-Temperature Superconductors: Crystal Anisotropy and Flux Pinning," Condensed Matter and Radiation Sciences Division Seminar, Naval Research Lab., Washington, D.C., March 31, 1992.

"Field and Temperature Dependent Resistivity in High Temperature Superconductors: The Role of Defects and Anisotropy," seminar at New Jersey Institute of Technology, Newark, New Jersey, November 9, 1992.

"Field and Temperature Dependent Resistivity in High Temperature Superconductors: The Role of Defects and Anisotropy," seminar at AT&T Bell Labs, Murray Hill, New Jersey, November 10, 1992.

"Anisotropic Field and Temperature Dependent Surface Resistance of High Temperature Superconductors," talk at Massachusetts Institute of Technology, Boston, MA, November 5, 1993.

"'Quantum' Confined Metallic Oxygen, the Key to High Temperature Superconductivity," The College of Science Distinguished Scholar Lecture, University of Notre Dame, April 20, 1994.

"Confined Divalent Metallic Oxygen: The Key to High Temperature Superconductivity," seminar at the University of Missouri-Columbia, Department of Physics and Astronomy, April 27, 1994.

"'Quantum' Confined Metallic Oxygen, the Key to High Temperature Superconductivity," Physics Department Colloquium, University of Missouri, April 27, 1994.

"The Role of Neutral Oxygen in High Temperature Superconductors," Chemistry Department Colloquium, San Jose State University, May 27, 1994.

"'Quantum' Confined Metallic Oxygen, the Key to High Temperature Superconductivity," Solid State Seminar, Purdue University, June 15, 1994.

"The $Billion Datum, Charge Transfer and Other Myths of High Temperature Superconductivity," seminar at Notre Dame Electrical Engineering Department, June 6, 1996.

"Implications of Superconductivity in $PrBa_2Cu_3O_7$," presentation of invited paper at International Conference on Superlattices, Microstructures and Microdevices, University of Nebraska, Lincoln, Nebraska, July 11, 1997.

"Superconductivity of $R_{2-z}Ce_zCuO_4$ Type Compounds," invited talk at the International Conference on Superconductivity, Southern University, Baton Rouge, Louisiana, February 19-24, 1998.

"High Temperature Superconductivity: Myth Meets Reality," Physics Department Colloquium, University of Notre Dame, November 25, 1998.

"Superconductivity of $PrBa_2Cu_3O_7$," H.A. Blackstead and J.D. Dow, invited talk at the Conference on High-Temperature Superconductivity and Related Topics (HTS99), University of Miami Department of Physics, Miami, Florida, January 7-13, 1999.

"High Temperature Superconductivity: Myth Meets Reality," University of Cincinnati Electrical Engineering/Computer Science Seminar, Cincinnati, Ohio, February 4, 1999.

"Implications of Superconductivity in $PrBa_2Cu_3O_7$," University of North Dakota, Physics Department Colloquium, Grand Forks, North Dakota, October 8, 1999.

"Progress in Ruthenate High Temperature Superconductivity: Superconductivity Without Cuprate Planes and Superconductivity with Magnetic Cuprate Planes," Third International Conference on Superconductivity (MPS-2002), Yalta, Ukraine, September 9, 2002.

"Superconductivity Without Cuprate Planes and Superconductivity With Magnetic $CuO_2$ Planes," Modern Problems of Superconductivity, International Conference, Yalta, Crimea, Ukraine, September 9-14, 2002.

"Evidence for Magnetically Ordered Cu in Superconducting Rutheno-Cuprates," New3SC-4 Conference, San Diego, California, January 16, 2003.

## Contributed Talks

"Nonresonant Microwave Absorption in $R_1Ba_2Cu_3O_{7-x}$ (R+Y, Dy, Gd) High-$T_c$ Superconductors as a Function of Magnetic Field," paper presented at Midwest Solid State Conference, University of Notre Dame, Notre Dame, IN., October 19-20, 1987.

"Microwave Absorption Evidence for Antiferromagnetism in $La_2CuO_4$," paper presented at Midwest Solid State Conference, University of Notre Dame, Notre Dame, IN., October 19-20, 1987.

"Resonant Microwave Absorption in $La_2CuO_4$," H.A. Blackstead, W.J. Tomasch, P.J. McGinn, Bull. Amer. Phys. Soc. 33, 556 (1988).

"Magnetic-field dependence of nonresonant microwave absorption in $R_1Ba_2Cu_3O_7$ (R=Y, Gd, Dy)," W.J. Tomasch, H.A. Blackstead, P.J. McGinn, S.T. Ruggiero, J.R. Clem, Bull. Amer. Phys. Soc. 33, 774 (1988).

"Anomalous Angular Dependence of Nonresonant Mixcrowave Power Absorption in Superconducting $YBa_2Cu_3O_{7-x}$ Single Crystals," W.J. Tomasch, H.A. Blackstead, and P.J. McGinn, Proc. 36th Midwest Solid State Conf., 32 (1988).

"Anomalous Angular Dependence of Nonresonant Microwave Absorption in $YBa_2Cu_3O_{7-x}$ Single Crystals," W.J. Tomasch, H. A. Blackstead, P.J. McGinn, E.K. Moser, D. Pulling, G. Morrow, J. Maier, and T. Lewis, Bull. Am. Phys. Soc. 34, 648 (1989).

"Anomalous Angular Dependence of Nonresonant Microwave Absorption in Superconducting $ErBa_2Cu_3O_{7-x}$ Single Crystals," E.K. Moser, H.A. Blackstead, W.J. Tomasch, P.J. McGinn, D. Pulling, G. Morrow, J. Maier, and T. Lewis, Bull. Am. Phys. Soc.34, 648 (1989).

"Non-resonance Microwave Power Absorption in Superconducting BiSrCaCuO," H.A. Blackstead, W.J. Tomasch, P.J. McGinn, E.K. Moser, D. Pulling, G. Morrow, J. Maier, and T. Lewis," Bull. Am. Phys. Soc. 34, 647 (1989).

"Magnetic Resonance in Gd123," Midwest Solid State Conference, Lincoln, NE, November 9-10, 1990.

"Microwave Dissipation in Crystalline BSCCO and YBCO," Midwest Solid State Conference, Lincoln, NE, November 9-10, 1990.

"Catastrophic Breakdown of Melt-Textured Y-Ba-Cu-O with Ba-Sn-O Additions," Am. Phys. Soc. 37, 537 (1992).

"Flux-Flow and Phase-Slip Dissipation in Two Phase Polycrystalline Pi-Pb-Sr-Ca-Cu-O," Bull. Am. Phys. Soc. 37, 229 (1992).

"Oxide Superconductivity," H.A. Blackstead and J.D. Dow, Electrochemical Society Meeting, San Francisco, May 22, 1994.

"Superlattice Model of Superconductivity," H.A. Blackstead and J.D. Dow, Electrochemical Society Meeting, San Francisco, May 22, 1994.

"Charge-Distributions in $Y_uPr_{1-u}Ba_2Cu_3O_x$," H.A. Blackstead, J.D. Dow, J.F. Federici, W.E. Packard and D.B. Pulling, 4th International Conference, Materials & Mechanisms of Superconductivity, High Temperature Superconductors, Grenoble, France, July 6, 1994.

"Depression of $T_c$ Caused by $Nd^{+3}$ Pair-Breaking in $NdBa_2Cu_3Ox$," H.A. Blackstead, J.D. Dow, W.E. Packard, and D.B. Pulling, 4th International Conference, Materials & Mechanisms of Superconductivity, High Temperature Superconductors, Grenoble, France, July 6, 1994.

"Evidence of Superconductivity in $PrBa_{2Cu3}O_7$," H.A. Blackstead, D.B. Chrisey, J.D. Dow, J.S. Horwitz, A.E. Klunzinger, and D.B. Pulling, 4th International Conference, Materials & Mechanisms of Superconductivity, High Temperature Superconductors, Grenoble, France, July 6, 1994.

"Oxide Superconductivity," H.A. Blackstead and J.D. Dow, Bull. Am. Phys. Soc. 39, 876 (1994).

"Field and Temperature Dependent Surface Resistance of Superconducting Polycrystalline Hg-Ba-Ca-Cu-O," D.B. Pulling, H.A. Blackstead, M. Paranthaman, and J. Brynstad, Bull. Am. Phys. Soc. 39, 787 (1994).

"Oxide Superconductivity," H.A. Blackstead and J.D. Dow, Bull. Am. Phys. Soc. 39, 876 (1994).

"High Temperature Superconductivity: pair Breaking as a Probe," H.A. Blackstead and J.D. Dow, MRS Fall 1994.

"High Temperature Superconductivity: The Role of Oxygen," H.A. Blackstead and J.D. Dow, MRS Fall 1994.

"Charge Transfer in High Temperature Superconductors," D.W. Jenkins, H.A. Blackstead, and J.D. Dow, March Meeting of the American Physical Society, San Diego, 1995.

"(Rare-Earth)$Ba_2Cu_3O_7$ Homologues: Superconductivity and Pair-Breaking in the Chains," H.A. Blackstead and J.D. Dow, March Meeting of the American Physical Society, San Diego, 1995.

"Superconductivity Associated with Dopant Oxygen in BSCCO," J.D. Dow and H.A. Blackstead, March Meeting of the American Physical Society, San Diego, 1995.

"Predicting Higher $T_c$," H.A. Blackstead and J.D. Dow, Superlattice Conference, Cincinnati, Sept. 1995.

"High Temperature Superconductivity," J.D. Dow and H.A. Blackstead, Superlattice Conference, Cincinnati, Sept. 1995.

"Predicting Higher $T_c$," H.A. Blackstead and J.D. Dow, Electrochemical Society meeting in Chicago, Oct. 8-13, 1995.

"Ni and Zn in High $T_c$ Superconductors," H.A. Blackstead and J.D. Dow, Boston MRS meeting, Nov. 27-Dec. 1, 1995.

"Phase transitions in layered superconductors," J.V. Acrivos, C.M. Burch, L. Nguyen, H.A. Blackstead, and C. Boekema, Bull. Am. Phys. Soc. 41, 287 (1996).

"Dependence of Tc on d, the separation between cuprate-plane Cu and the closest charge reservoir oxygen," P. Beeli, H.A. Blackstead, and J.D. Dow, Bull. Am. Phys. Soc. 41, 18 (1996).

"Pr Pair-breaking in Y123 vs. Y124," A.E. Klunzinger, H.A. Blackstead, and J.D. Dow, Bull. Am. Phys. Soc. 41, 18 (1996).

"The p-type superconductivity of $La_{2-\beta}Sr_{\beta}CuO_4$ is where the holes are, not in the n-type cuprate planes," D.B. Pulling, H.A. Blackstead, and J.D. Dow, Bull. Am. Phys. Soc. 41, 184 (1996).

"Superconductivity in $PrBa_2Cu_3O_7$ and its homologues," H.A. Blackstead and J.D. Dow, Bull. Am. Phys. Soc. 41, 365 (1996).

"Magnetic properties of high-temperature superconductors," J.D. Dow, and H.A. Blackstead, Bull. Am. Phys. Soc. 41, 184 (1996).

"Phenomenology: What the Data Say," H.A. Blackstead and J.D. Dow, Tenth Anniversary High Temperature Superconductor Workshop on Physics, Materials and Applications, Houston, TX, March 12-16, 1996.

"Absence of Magnetic Pair-Breaking by Ni in Most High-Temperature Superconductors," MOS '96, International Conference on Physics and Chemistry of Molecular and Oxide Superconductors, Karlsruhe, Germany, August 2-6, 1996.

"Theory of $Sm_{1.5}Ce_{0.5}Sr_2Cu_2NbO_{10}$: Critical Temperature and Doping Effects," MOS '96, International Conference on Physics and Chemistry of Molecular and Oxide Superconductors, Karlsruhe, Germany, August 2-6, 1996.

"Successful Prediction of $T_c$ for $R_2Sr_2Cu_2NbO_{10}$," H.A. Blackstead and J.D. Dow, MOS '96, International Conference on Physics and Chemistry of Molecular and Oxide Superconductors, Karlsruhe, Germany, August 2-6, 1996.

"Absence of Pair-Breaking by Ni Relative to Zn," H.A. Blackstead and J.D. Dow, MOS '96, International Conference on Physics and Chemistry of Molecular and Oxide Superconductors, Karlsruhe, Germany, August 2-6, 1996.

"$R_2Sr_2Cu_2NbO_{10}$ Predictions," H.A. Blackstead and J.D. Dow, 1996 Fall MRS Meeting, Boston, Massachusetts.

"Observation of Josephson Vortices in Crystalline $Y_{1-u}Pr_uBa_2Cu_3O_7$," H.A. Blackstead, D.B. Pulling, and B. Jayaram, presented at Fall 1996 Materials Research Society Conference, Boston, MA, December 2, 1996.

"Insulators and Superconductors: Predictions," H.A. Blackstead and J.D. Dow, presented at Fall 1996 Materials Research Society Conference, Boston, MA, December 2, 1996.

"Magnetic Pinning by Ba-Site Magnetic Ions in $R_{1+u}Ba_{2-u}Cu_3O_x$," H.A. Blackstead and J.D. Dow, presented at the Gordon Conference on High Temperature Superconductivity, Ventura, CA, January 12-17, 1997.

"Chemical Trends with d, the Cuprate Plane - Charge Reservoir Distance," H.A. Blackstead and J.D. Dow, presented at the Gordon Conference on High Temperature Superconductivity, Ventura, CA, January 12-17, 1997.

"Evidence That All High Temperature Superconductors are p-type," H.A. Blackstead and J.D. Dow, presented at the Gordon Conference on High Temperature Superconductivity, Ventura, CA, January 12-17, 1997.

"The Case Against all Remote-Control Cuprate Plane Models of HTSC," H.A. Blackstead and J.D. Dow, presented at the Gordon Conference on High Temperature Superconductivity, Ventura, CA, January 12-17, 1997.

"Hybridization Models, Cuprate Planes, and the Apparent Lack of Superconductivity in Pr123: Implications," H.A. Blackstead and J.D. Dow, presented at the Gordon Conference on High Temperature Superconductivity, Ventura, CA, January 12-17, 1997.

"Observation of Granular Superconductivity in Polycrystalline $Sm_{2-x}Ce_xCuO_{4-y}$," P. Beeli, H.A. Blackstead, D.B. Pulling, and A.K. Heilman, presented at the March Meeting of the American Physical Society, Kansas City, Missouri, March 17-21, 1997.

"Crystal Field Effects in $Ln_{2-z}Ce_zCuO_4$ Homologues," W.E. Packard, J.D. Dow, and H.A. Blackstead, presented at the March Meeting of the American Physical Society, Kansas City, Missouri, March 17-21, 1997.

"Percolative Superconductivity in $Ln_{2-z}Ce_zSr_2Cu_2MO_{10}$," D.B. Pulling, D. Goldschmidt, H.A. Blackstead, and J.D. Dow, presented at the March Meeting of the American Physical Society, Kansas City, Missouri, March 17-21, 1997.

"Size Effect on $Ln_{2-z}Ce_zCuO_4$ Superconductivity," M. Lehmann, J.D. Dow, D.B. Pulling, and H.A. Blackstead, presented at the March Meeting of the American Physical Society, Kansas City, Missouri, March 17-21, 1997.

"Simple Proof from the Data that Whatever part of the Crystal Structure Superconducts in $Nd_{2-z}Ce_zCuO_4$ is Different from the Superconducting part of $Nd_{2-z}Ce_zSr_2Cu_2MO_{10}$," H.A. Blackstead and J.D. Dow, presented at the March Meeting of the American Physical Society, Kansas City, Missouri, March 17-21, 1997.

"Replacement for (Superconducting) $PrBa_2Cu_3O_7$ that is Supposed to Insulate," H.A. Blackstead and J.D. Dow, presented at the March Meeting of the American Physical Society, Kansas City, Missouri, March 17-21, 1997.

"Are all High-temperature Superconductors p-type?," J.D. Dow and H.A. Blackstead, presented at the March Meeting of the American Physical Society, Kansas City, Missouri, March 17-21, 1997.

"Wavelength Dependence of Infrared Quenched Persistent Photoconductivity in Y123," D. Bubb, J.F. Federici, T. Tyson, W. Savin, W. Wilber, and H.A. Blackstead, presented at the March Meeting of the American Physical Society, Kansas City, Missouri, March 17-21, 1997.

"The Effect of Infrared Radiation on Photoinduced Superconductivity and Persistent Photoconductivity in Y123," A.K. Heilman, H.A. Blackstead, J.F. Federici, and D. Chew, presented at the March Meeting of the American Physical Society, Kansas City, Missouri, March 17-21, 1997.

"Evidence of Pair-Breaking by $Pr_{Ba}$ in $Y_{1-y}Pr_yBa_2Cu_3O_7$," H.A. Blackstead, J. Cooley, J.D. Dow, W.L. Hults, S.K. Malik, D.B. Pulling, J.L. Smith, and W.B. Yelon, Spectroscopies of Novel Superconductors '97, Cape Cod, MA, September 14-18, 1997.

"Observation of Predicted Superconductivity in $Gd_{2-z}Ce_zSr_2Cu_2TiO_{10}$," H.A. Blackstead, D.B. Pulling, J.D. Dow, and D. Goldschmidt, Spectroscopies of Novel Superconductors '97, Cape Cod, MA, September 14-18, 1997.

"Trends in Superconductivity of $Nd_{2-z}Ce_zCuO_4$ and its Homologues," H.A. Blackstead and John D. Dow, Spectroscopies of Novel Superconductors '97, Cape Cod, MA, September 14-18, 1997.

"Superconductivity of Superlattice $(Rare\text{-}Earth)_{2-z}Ce_zCuO_4/SrO/NbO_2/SrO/CuO_2$: Relationship to Bulk $(Rare\text{-}Earth)_{2-z}Ce_zCuO_4$," H.A. Blackstead and John D. Dow, Spectroscopies of Novel Superconductors '97, Cape Cod, MA, September 14-18, 1997.

"$Nd_{Ba}$: A Primary Flux-Pinning Defect in $NdBa_{2-u}Nd_uCu_3O_7$," Howard A. Blackstead and John D. Dow, 1997 Fall Meeting of the Materials Research Society, Boston, MA, December 1-5, 1997.

"Unreliability of $PrBa_2Cu_3O_7$ and Reliability of $NdBa_2Cu_2TaO_8$ as Insulators for Josephson Junction Technology," Howard A. Blackstead and John D. Dow, 1997 Fall Meeting of the Materials Research Society, Boston, MA, December 1-5, 1997.

"Superconductivity in $PrBa_2Cu_3O_7$: Implications," J.D. Dow and H.A. Blackstead, 1998 March Meeting of the American Physical Society, Los Angeles, California.

"Superconducting $PrBa_2Cu_3O_7$ Powders," J.C. Cooley, W.L. Hults, E.J. Peterson, J.D. Dow, H.A. Blackstead, and J.L. Smith, 1998 March Meeting of the American Physical Society, Los Angeles, California.

"Wavelength Dependence of Infrared Quenched Persistent Photoconductivity in Y123," D. Bubb, J.F. Federici, T. Tyson, H.A. Blackstead, and A.H. Klunzinger, 1998 March Meeting of the American Physical Society, Los Angeles, California.

"Spin-Fluctuation Pairing in HTSCs," W.E. Packard, J.D. Dow, and H.A. Blackstead, 1998 March Meeting of the American Physical Society, Los Angeles, California.

"Interstitial Oxygen and p-type Superconductivity in $Nd_{2-z}Ce_zCuO_4$," M. Lehmann, J.D. Dow, and H.A. Blackstead, 1998 March Meeting of the American Physical Society, Los Angeles, California.

"Observation of Predicted Superconductivity in $Gd_{2-z}Ce_zSr_2Cu_2TiO_{10}$," D.B. Pulling, D. Goldschmidt, H.A. Blackstead, and J.D. Dow, 1998 March Meeting of the American Physical Society, Los Angeles, California.

"Weak Ferromagnetic Resonance (WFMR) Coexisting with Superconductivity in $Gd_{2-z}Ce_zSr_2Cu_2RuO_{10}$," H.A. Blackstead, J.D. Dow, and I. Felner, 1998 March Meeting of the American Physical Society, Los Angeles, California.

"Surface Resistance Studies of Fast Neutron Irradiated $YBa_2Cu_3O_{7-\delta}$ Thin Films," H.A. Blackstead, A.K. Heilman, M. Kornecki, J.W. Farmer, R.M. Stroud, and D.B. Chrisey, 1998 March Meeting of the American Physical Society, Los Angeles, California.

"Superconductivity in $PrBa_2Cu_3O_7$," H.A. Blackstead and J.D. Dow, Gordon Conference on Superconductivity, Oxford, United Kingdom, September 6-11, 1998.

"Superconductivity of $R_{2-z}Ce_zCuO_4$ & $R_{2-z}Ce_zSr_2Cu_2M_{10}$, Compounds, M=Nb, Ta, Ti, Ru," J.D. Dow and H.A. Blackstead, Gordon Conference on Superconductivity, Oxford, United Kingdom, September 6-11, 1998.

"High-temperature superconductivity is charge-reservoir superconductivity," J.D. Dow and H.A. Blackstead, Conference on High-Temperature Superconductivity and Related Topics (HTS99), University of Miami Department of Physics, Miami, Florida, January 7-13, 1999.

"Microwave and Mössbauer spectroscopy of high-temperature superconductors," D.B. Pulling, H.A. Blackstead, and J.D. Dow, Conference on High-Temperature Superconductivity and Related Topics (HTS99), University of Miami Department of Physics, Miami, Florida, January 7-13, 1999.

"Location and Properties of the superconducting hole-condensate in $Sr_2Yru_{1-u}Cu_uO_6$," Howard A. Blackstead, John D. Dow, Dale R. Harshman, David B. Pulling, W.J. Kossler, A.J. Greer, C.E. Stronach, E. Koster, B. Hitti, M.K. Wu, D.Y. Chen, and F.Z. Chien, at the 6th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Houston, Texas, February 20-25, 2000.

"Anomalies of high-temperature superconductivity," Martin Lehmann, John D. Dow, and Howard A. Blackstead, at the 6th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Houston, Texas, February 20-25, 2000.

"$Eu_{2-z}Ce_zSr_2Cu_2RuO_{10}$ superconducts in its SrO layers, not in its cuprate-planes," Howard A. Blackstead, John D. Dow, Dale R. Harshman, Israel Felner, David B. Pulling, W.J. Kossler, A.J. Greer, C.E. Stronach, E. Koster, and B. Hitti, at the 6th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Houston, Texas, February 20-25, 2000.

"Four Predicted High-Temperature Superconductors," Howard A. Blackstead and John D. Dow, at the 6th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Houston, Texas, February 20-25, 2000.

"Magnetic resonance and surface resistance of $Ba_2GdRu_{1-u}Cu_uO_6$," Howard A. Blackstead, John D. Dow, Dale R. Harshman, David B. Pulling, M.K. Wu, D.Y. Chen and F.Z. Chien, at the 6th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Houston, Texas, February 20-25, 2000.

"The Nature of a Correct Theory of High-Temperature Superconductivity," Howard A. Blackstead and John D. Dow, at the 6th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Houston, Texas, February 20-25, 2000.

# Howard A. Blackstead

## List of Scientific Publications

1. "Gravitational Flow of Superfluid Helium at 0.45$^{o}$K," J.N. Kidder and H.A. Blackstead, Proceedings of the IXth International Conference on Low Temperature Physics, Columbus, Ohio 331 (1964).

2. "Microwave Magnetoelastic Effect in Thin Films of Dy, Ho, and Er," M.P. Maley, H.A. Blackstead, and P.L. Donoho, J. Appl. Phys. 37, 1006 (1966).

3. "Microwave Absorption to Dysprosium Single Crystals," H.A. Blackstead, and P.L. Donoho, Proceedings of the VIth Rare-Earth Research Conference, Gatlinburg, Tennessee, 58 (1967).

4. "Phonon Emission From Terbium Films at 15 GHz," Michael T. Elliott and Howard A. Blackstead, Phys. Rev. Lett. 29, 603 (1972).

5. "Generation of Gigahertz Phonons in Dysprosium Films," M.T. Elliott, J.T. Wang, and H.A. Blackstead, A.I.P. Conference Proceedings 10, Magnetism and Magnetic Materials, C.D. Graham and J.J. Rhyne Eds., (American Institute of Physics, New York, 1973), 774.

6. "Elastic Wave Generation in Dy, Tb, Gd, and Tb-Fe Films," P.L. Donoho, L.V. Benningfield, P.K. Wunsch, L.B. McLane, and H.A. Blackstead, A.I.P. Conference Proceedings 10, Magnetism and Magnetic Materials, C.D. Graham and J.J. Ryne Eds., (American Institute of Physics, New York, 1973), 769.

7. "A Magnet Sweep Controller," M.T. Elliott and H.A. Blackstead, Rev. Sci. Instr. 44, 1426 (1973).

8. "Parametric Generation of 48 GHz Phonons in Gd Films," M.T. Elliott and H.A. Blackstead, Solid State Commun. 13, 953 (1973).

9. "Magnetoelastic Resonances in Gd Films," M.T. Elliott and H.A. Blackstead, Letters al Nuovo Cimento 8, 439 (1973).

10. "Magnetoresistance and Field-Induced Phase Transitions in the Helical Antiferromagnetic State of Dysprosium," M. Akhavan and H.A. Blackstead, Phys. Rev. B8, 4258 (1973).

11. "Standing Magnetoelastic Waves in Rare-Earth Ferromagnetic Films," M.T. Elliott, M. O'Donnell, and H.A. Blackstead, Phys. Rev. Lett. 32, 734 (1974).

12. "Generation of Gigahertz Phonons in Dysprosium Films Through the Excitation of Normal Magnetoelastic Modes and Parametric Processes," M.T. Elliott, J.T. Wang, and H.A. Blackstead, Int. J. Magnetism 6, 33 (1974).

13. "Phonon Spectroscopy: An Experimental Technique for the Investigation of Dynamic Magnetoelastic Interactions in Rare Earth Metals," H.A. Blackstead, Proceedings of the Eleventh

Rare Earth Research Conference, J.M. Haschke and H.A. Eick, Editors (USAEC Technical Information Center, Oak Ridge, 1974), 1096.

14. "Magnetoresistance and Field-Induced Phase Transitions in the Helical and Conical States of Holmium," M. Akhavan and H.A. Blackstead, Phys. Rev. B13, 1209 (1976).

15. "Excitation of Gigahertz Magnetoelastic Waves in Dysprosium Films: Frequency Dependence," J.T. Wang, M. O'Donnell and H.A. Blackstead, Phys. Rev. B13, 2044 (1976).

16. "Magnetoelastic Excitations In Single-Crystal Gadolinium," M. O'Donnell, J.T. Wang and H.A. Blackstead, Phys. Rev. Lett. 36, 606 (1976).

17. "Dynamic Magnetoelastic Coupling in Ni," M. O'Donnell, S.C. Hart, J.G. Sylvester and H.A. Blackstead, Solid State Communications, Vol. 18, 1141 (1976).

18. "Static and Dynamic Coupling in Metallic Ferromagnets," M. O'Donnell and H.A. Blackstead, AIP Conference Proceedings Number 34, Magnetism and Magnetic Materials - 1976, Ed. J.J. Becker and G.H. Lander, 242.

19. "Excitation of Gigahertz Magnetoelastic Waves in Terbium Films: Field Dependence," J.G. Sylvester, S.C. Hart, and H.A. Blackstead, Phys. Rev. B17, 1283 (1978).

20. "Phonon and Magnon Resonances in $GdFe_2$ Films," H.A. Blackstead, J.G. Sylvester, A. Ambrosio, S.C. Hart, and A.E. Miller, Rare Earths in Modern Science and Technology, G.J. McCarthy and James J. Rhyne, eds., Proceedings of the 13th Rare Earth Conference, 447 (1977).

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## Papers Accepted for Publication

"Anomalous Magnetic Ordering in Pr124 and in Cm123," H.A. Blackstead and M.P. Smylie, W.B. Yelon, Q. Cai and M. Kahveci, to be published in Phys. Rev. B

"PSYCO Homologues: *p*-Type Superconduct, but *n*-Type Do Not," H.A. Blackstead and J.D. Dow, to be published in ***J. Low Temp. Physics.***

"Location of superconductivity in $La_{2-\beta}Sr_{\beta}CuO_4$," A. Kumar, J.D. Dow, and H.A. Blackstead, to be published in Philosophical Magazine.

## Papers Submitted

"Analysis of Temperature and Field Dependent Resistivity of Superconducting Single Phase $Bi_2Sr_2Ca_2Cu_3O_{10+\delta}$," H.A. Blackstead, submitted to *Physica C*, Jan. 30, 1996.

"A Search for Magnetic Resonance of Ruthenium in Octahedral Coordination with Oxygen", by H.A. Blackstead, W.B. Yelon, M. Kornecki, M.P. Smylie, P.J. McGinn, and Q. Cai, submitted for publication in J. Magnetism and Magnetic Materials.

"Cuprate Plane Magnetic Ordering in Superconducting $Y_{1.5}Ce_{0.5}Sr_2Cu_2NbO_{10}$", by H.A. Blackstead, W.B. Yelon, M.P. Smylie, Q. Cai, J. Lamsal, V.P.S. Awana, S. Balamurugan, and E. Takayama-Muromachi , submitted for publication in Phys. Rev. Lett.

"Antiferromagnetism and Superconductivity: Determination of the Cu spin-spin relaxation time $T_2$ and the spin-lattice relaxation time $T_1$ in $Gd_{1.5}Ce_{0.5}Sr_2Cu_2RuO_{10}$", by H.A. Blackstead, W.B. Yelon, and M.P. Smylie, submitted for publication in Phys. Rev. Lett.

"Antiferromagnetism and Superconductivity: Magnetic order in $Y_{1.5}Ce_{0.5}Sr_2Cu_2RuO_{10}$", by H.A. Blackstead, W.B. Yelon, M.P. Smylie, M. Kornecki, Q. Cai, J. Lamsal, V.P.S. Awana, S. Balamurugan, and E. Takayama-Muromachi, submitted for publication in Phys. Rev. B.

**Experience**

Instructor in Introduction to Electronics since 1975.

Instructor in Physics 403, Instrumentation with Microprocessors, 1978 thru 1984. I developed the microprocessors from the chip level up which were used in this course which taught students how to design and construct hardware for computer interfaces and develop the software to drive them.

Instructor Physics 442, Modern Physics Lab for five years.