

CURRICULUM VITAE

October 10, 2013

Stewart Edward BARNES

PERSONAL.

Nationalities: United Kingdom of Great Britain, and Switzerland

Languages: English mother tongue, fluent in French.

ADDRESSES.

Department of Physics,

University of Miami,

Coral Gables, Florida 33124

tel: + 1 305 284 7113

fax + 1 305 284 4222

8141 SW 140 Terrace,

Miami, Florida 33158

USA

tel: + 1 305 278 8816 or +41 22 342 6175

cell: +1 786 246 9554 or + 41 77 4196084

Internet: barnes@physics.miami.edu

HIGHER EDUCATION.

Ph.D. Physics, University of California, Los Angeles, Dec. 1972

Thesis Advisor: Professor R. L. Orbach

B.Sc. Physics, Imperial College, University of London, June 1968

ACADEMIC APPOINTMENTS.

Assistant (June 1, 1980), Associate (June 1, 1982) to Full Professor (June 1, 1985) of Physics
University of Miami, Florida. August 1980-present

Chargé de Recherche

University of Geneva, Switzerland. October 1977-August 1980

Lecturer

Trinity College, University of Dublin, Ireland. October 1975-October 1977

Maître Assistant

University of Geneva, Switzerland. October 1974-October 1975

Research Fellow (with D. Thouless)

University of Birmingham, England. October 1972-October 1974

CONCURRENT APPOINTMENTS (while at the University of Miami).

University of Geneva, Switzerland. May-June 1981 and May-June 1987, academic year 1988-89, May-August 1991, June-July 1992, June-July 1993, December 1998, March-Oct. 2007, May-July 2010, May-July 2011, May-July 2012

Free University of Berlin, Germany. July-August 1981 and May-June 1982

IBM Research Center, Yorktown Heights, N.Y. May 1983, July 1984, August 1986 and May 1988

ETH, Zürich, May-June 1990, Jan.-March 1994

University of Cologne, July-August, 1992

University of Neuchatel, July, September 1993

University of Karlsruhe, October-November 1993

ILL, Grenoble, April-May 1994

Laboratoire Louis Néel (University of Grenoble) June-August 1994, (CNRS) January-August 1996

Institute for Materials Research, Tohoku University, Japan, September 2000-March 2001, July-August 2009

Distinguish Visiting Professor, International Frontier Center for Advanced Materials, Institute for Materials Research, Tohoku University, Japan, June-August 2002, July-October 2003, May-August 2004, June-August 2006, Jan.- Feb. 2008.

Kavli Institute for Theoretical Physics, University of California, Santa Barbara,
Spintronics program, April 24-May 12, 2006

Fudan University, Shanghai, China, Nov.-Dec. 2007

Cavendish Laboratory, and Wolfson College, University of Cambridge, UK, March-August 2008

Ecole polytechnique Lausanne Switzerland: Visiting professor: May 15 - June 14, 2009

Centre national de la recherche scientifique (CNRS) Orsay - May, 2010

University of Paris-Sud, invited professor - June, 2010

Advanced Science Research Center (ASRC) of Japan Atomic Energy Agency, Tokai Japan: mid-July to mid-August 2010 and 2011, two weeks June and August 2012.

INVITED CONFERENCE CONTRIBUTIONS.

Josephson Type Oscillations in a Moving Charge Density Wave.

Gordon Conference “Quantum Solids and Fluids”, Brewster, N.H. August 1983.

ESR Spectroscopy in SNS Josephson Junctions.

With K. D. Bures, K. Baberschke. Invited contribution to a discussion session at LT17, Karlsruhe 1984 (presented by K. D. Bures).

Microscopic Theory of Interaction of CDW with Impurities.

With A. Zawadowski, I. Tutto, P.F. Tua and J. Ruvalds (presented by A. Zawadowski). CDW '84 conference, Budapest 1984.

Quantum Effects in the Josephson Approach to a CDW.

Workshop following CDW '84 conference, Budapest 1984.

Basic theory for 2D-ACAR of positrons from superconductors.

Third International Workshop on Positron and Positronium Chemistry, Milwaukee, July 16-18, 1990.

Theory of positron annihilation in the spinon-holon picture

Workshop on fermiology of high- T_c superconductors, Argonne National Laboratory, March 25-27, 1991

What can positrons contribute to high- T_c superconductivity?

With M. Peter, T. Jarlborg, A. A. Manuel, B. Barbiellini (presented by M. Peter), Sagamore conference on electron spin and momentum densities in solids, Konstanz, Germany, September 2-6, 1991

Auxiliary Particle methods: the old fashioned and the new

Eötvös Graduate School “Strongly Correlated Electron Systems and Low Dimensional Materials”, Budapest, Hungary, Aug. 25 -September 1, 1993

Electronic structure of vortices in high T_c superconductors

Second International Conference on New Theories, Discoveries, and Applications of Superconductors and Related Materials, to be held May 31 - June 4, 1999, Las Vegas, Nevada, USA

Quantum Coherence and Tunneling in Nanomagnets.

Institute of Theoretical Physics, Conference on Quantum Magnetism, Santa Barbara, California, August 16-20, 1999

New approach to the theory of vortices in high- T_c superconductors.

Sendai international workshop November 13-18, 2000

Re-examination of the role of the Kondo divergence in band formation for high T_c superconductors.

The Third International Conference on New Theories, Discoveries and Applications of Superconductors and Related Materials, January 15 - 19, 2001 Honolulu, Hawaii.

Quantum critical points ARPES and a Jordan-Wigner formulation for high T_c superconductors

Workshop for the inauguration of the international frontier center for advanced materials Institute for Materials Research, Tohoku University, Japan. June 2002

Hole phase separation in underdoped cuprate superconductors

International Symposium on Inhomogeneous and Strongly Correlated Materials with Novel Elec-

tronic Properties (ISCM), Miami Beach FL March 24-28, 2003.

The formation of hole rich regions in underdoped cuprate superconductors.

Fourth International Conference on New Theories, Discoveries, and Applications of Superconductors and Related Materials (New3SC-4) January 16 - 21, 2003 San Diego, California

Current driven dynamics of bi-domain spin valves

CREST mini-workshop on Spintronics 1 March , Tohoku University, Japan. June 2005

Spinmotive Forces and Torque Transfer in Spin Valves and Domain Walls

24th International Conference on Low Temperature Physics, 10 - 17 August 2005, Orlando, Florida, USA

Spin angular momentum transfer, modified Gilbert relaxation and the Berry phase emf in the dynamics of magnetic domains

Spin Currents, A workshop on the latest developments in spin currents in metals and semiconductors, IBM, San Jose, 17-19 March 2006

Motive forces from the Berry phase in ferromagnets

Conference: *Spin Currents*, 14 August Sendai, Japan 2006

Angular momentum transfer, Berry phase forces and environmental coupling for magnetic domain walls

19th International Colloquium on Magnetic Films and Surfaces, August 15-18, 2006, Sendai, Japan

Spin-motive-forces and spin-transfer torque for spin-valves and domain walls in magnetic nano-wires

ATI International Workshop and CREST International Workshop on spin currents Institute for Materials Research, Tohoku University, Sendai, Japan, 18-19 February 2008

Spin motive forces, measurements, and spin-valves

International Conference on Magnetism, August 21-26, 2006, Kyoto, Japan

Role of motive forces for the spin torque transfer for nano-structures

Speaker: S. E. Barnes

American Physical Society March Meeting, Pittsburgh, Pennsylvania, USA, March 16-20 (2009)

Electromotive force and magnetoresistance ($\sim 100,000\%$) in magnetic tunnel junctions with zinc-blende MnAs nanomagnets

P. N. Hai, S. Ohya, S.E. Barnes, S. Makeawa, M. Tanaka

18th Electronic Properties of 2 Dimensional Systems (EP2DS-18) and 14th Modulated Semiconductor Structures (MSS14), Kobe, Japan, 19-24, 2009. .

Spin electromotive force and huge magnetoresistance: can Faradays Law be extended?

Pham Nam Hai, Shinobu Ohya, Masaaki Tanaka, Sadamichi Maeakwa, Stewart E. Barnes

The 70th Autumn Meeting, of The Japan Society of Applied Physics, Sept. 8 - 11, 2009, Toyama University, Toyama, Japan.

Motive forces in magnetic nano-structures

S. E. Barnes

The 4th International Workshop on Spin Currents and Spin Caloritronics, Institute for Materials Research (IMR), Tohoku University, Sendai on February 8 (Monday) - 10 (Wednesday), 2010.

Electromotive force and huge magnetoresistance in magnetic tunnel junctions with zinc-blende MnAs nanomagnets

P. N. Hai, S. Ohya, S. E. Barnes, S. Makeawa, and M. Tanaka

The 4th International Workshop on SPIN CURRENTS Sendai, Japan, 8-10 Feb. 2010

Observation of spin motive forces using ferromagnetic vortex core

D. Chiba, K. Tanabe, S. Kasai, J. Ohe, H. Kohno, S. E. Barnes, S. Maekawa, and T. Ono

The 4th International Workshop on SPIN CURRENTS Sendai, Japan, 8-10 Feb. 2010

Electromotive force and huge magnetoresistance in magnetic tunnel junctions with zinc-blende MnAs nano-magnets

Speaker: PHAM NAM HAI, The Univeristy of Tokyo

American Physical Society March Meeting, APS March Meeting, March 15-19, 2010 in Portland, OR

The APS only allows a single author in invited contributions. The invitation letter states this reflects the paper:

Electromotive force and huge magnetoresistance in magnetic tunnel junctions

Pham Nam Hai, Shinobu Ohya, Masaaki Tanaka, Stewart E. Barnes and Sadamichi Maekawa
Nature, **458**, 489-492, (2009).

Origin of spin-motive-forces,

S. E. Barnes,

5th International Workshop on Spin Currents July 25 - 28, 2011 Sendai International Center,
Sendai, JAPAN

Origin of spinmotive forces and spin SU(2) forces

The 2nd ASRC International Workshop on Magnetic Materials and Nanostructures, January 10-13,
Tokai, Japan

Spinmotive forces of thermal origin.

S. E. Barnes

Spin Caloritronics 4, Sendai, June 2-5, 2012

Recent Contributed Conference contributions:

Spin transfer torque and electro/spin-motive forces S. E. Barnes, American Physical Society,
APS March Meeting 2010, March 15-19, 2010

Experimental investigation of spin motive forces induced by a gyration motion of a magnetic vortex core

D. Chiba, K. Tanabe, S. Kasai, J. Ohe, H. Kohno, S. E. Barnes, S. Maekawa, and T. Ono

The 2nd International Symposium on Advanced Magnetic Materials and Applications ISAMMA,
Sendai, Japan, 12-16 Jul. 2010

Experimental investigation of the spin motive forces induced by magnetic vortex core motion.

D. Chiba, K. Tanabe, J. Ohe, S. Kasai, H. Kohno, S. E. Barnes, S. Maekawa, and T. Ono

Joint European Magnetic Symposia JEMS 2010 Krakow, Poland, 23-28 Aug. 2010.

Ferromagnetic resonance in the presence of a heat current

E. Papa, G. Boero, S.E. Barnes, J.-Ph. Ansermet

Joint European Magnetic Symposia JEMS 2010 Krakow, Poland, 23-28 Aug. 2010.

Equations-of-motion approach of spin-motive force.

Y. Yamane, J. Ieda, J. Ohe, S.E. Barnes, and S. Maekawa

The 55th Magnetism and Magnetic Materials Conference Atlanta, USA, 14-18 Nov. 2010.

Investigation of the spin motive force induced by magnetic vortex core motion.

K. Tanabe, D. Chiba, S. Kasai, J. Ohe, H. Kohno, S. E. Barnes, S. Maekawa, and T. Ono

The 55th Magnetism and Magnetic Materials Conference Atlanta, USA, 14-18 Nov. 2010.

Continuous dc Spinmotive Force in a Patterned Ferromagnetic Film Yamane, Yuta;

Sasage, Kohei; An, Toshu; Harii, Kazuya; Ohe, Jun-Ichiro; Ieda, Jun'ichi; Barnes, Stewart; Saitoh, Eiji; Maekawa, Sadamichi American Physical Society, APS March Meeting 2012, February 27-March 2, 2012

Newtonian reciprocity between spinmotive forces (SMF) and spin-torque-transfer

(STT), S. E. Barnes, American Physical Society, APS March Meeting 2012, February 27-March 2, 2012

Ferromagnetic resonance in the presence of a heat current, Elisa Papa, Stewart E. Barnes,

Jean-Philippe Ansermet, IEEE International Conference on Microwave Magnetism 2012 Kaiserslautern, August 26-29, 2012 University of Kaiserslautern

INVITED EXTERNAL SEMINARS (while at the University of Miami)

University of Lieden, Netherlands. June 1981 and 1982

University of Groningen, Netherlands. Oct. 1992

Technische Hochschule, Darmstadt, West Germany. June 1982 and May 1989

Free University of Berlin, West Germany. July 1981 and June 1982

University of Geneva, Switzerland. June 1981, June 1988, May 1989, December 1991, May 2001, 18 May 2005

IBM, Yorktown Heights. May 1983, July 1984, August 1986 and May 1988

Clemson University, Clemson S.C. Oct 1984

National Research Council, Ottawa, Canada. August 1986 and December 1986

Virginia Tech., Blacksburg, Virginia. January 1987

University of Florida, Gainesville, September 1987

ETH Zurich, June 1990, June 1991 and February 1994

EPF Lausanne, June 1990, December 1991, January 2006, May 2009, July 2010

Florida State University, March 1993

University of Neuchâtel, January, 1992, July 1993, December 1996

University of Karlsruhe, November 1993

University and CNRS, Grenoble, January 1994, juillet 1996, December 1997, May 1998, 30 May 2005

University of Toulouse, July 1995

University of Bordeaux, July 1995

University of Cergy-Pontoise, May 1994, December 1996

University of St. Andrews, Scotland, July 29, October 14, 1999

Institute for Materials Research, Tohoku University, Japan, September and October 2000, February, March 2001, 30 June 2005, 1 March 2005, January, August 2002, January, May, July, September 2003, June, August 2004, 1 March 2005, June 30, 2005, 28 June 2006, 26 July 2006, 15 Jan 2008, 17 Jan 2008, 17 June 2009, August 2009

Technical University, Delft, 8 June 2005

Fudan University, Shanghai, China, Dec. 4 2007

Institute of Physics, Chinese Academy of Sciences, China, Dec. 5 2007

Electro-ferromagnetic theory

Institute for Materials Research (IMR), Tohoku University, Sendai, Japan 25 August, 2009

Anatomy of SU(2) spin-torque-transfer theory

Institute for Materials Research (IMR), Tohoku University, Sendai, Japan 17 June, 2009

Role of motive forces for the spin torque transfer for nano-structures

EPFL Lausanne, Switzerland, 2 June, 2009

The Spin Battery.

EM Microelectronic (Swatch Group), March 15, 2010, Marin, NE, Switzerland.

Role of motive forces for the spin torque transfer for nano-structures

Johns Hopkins University, Thurs, April 29, 2010 Baltimore, MD

Spin-motive-forces, spintronics and spin batteries.

Centre national de la recherche scientifique (CNRS), 20 May 2010, Orsay, France.

Practical consequences of spin-motive-forces in magnetic structures.

Université Paris Sud, June 23, 2010, Orsay, France

How experiments on Py:Cu bi-layers show the “spin-pumping” theory is incorrect!

Advanced Science Research Center (ASRC) of Japan Atomic Energy Agency, 27 July, 2010, Tokai
Japan

What is a spinmotive force?

S. E. Barnes,

Insitute de Physique, Ecole Polytechnique Federal Lausanne, 20 July 2011, Lausanne, Switzerland

Informal seminar: **Spin Batteries**

Stewart E. Barnes

Physics Institute, University of Zurich, 6 January, 2011, Zurich, Switzerland.

Origin of spin-motive-forces.

Stewart E. Barnes

Advanced Science Research Center (ASRC) of Japan Atomic Energy Agency, Jun. 14, 2011, Tokai

Japan

Informal seminar: **Spin Batteries**

Stewart E. Barnes

Ecole de Physique, University of Geneva, 13 May 2011, Geneva, Switzerland.

Giving Faraday's Law a New Spin

Stewart E. Barnes

Ecole de Physique, University of Geneva, 8 May 2012, Geneva, Switzerland.

GMR and the Nambu-Goldstone theorem.

Stewart E. Barnes

Advanced Science Research Center (ASRC) of Japan Atomic Energy Agency, 28 October, 2012,
Tokai Japan

MAJOR ADMINISTRATIVE AND COMMITTEE APPOINTMENTS.

Coordinator of the Physics Graduate Program, 1980-1985.

Member of the University Fellowships Committee, 1980-1986, 1995-1998.

Chairman of the Parking Authority Committee, 1985-1986.

Graduate Faculty Representative on the University Faculty Senate, 1985-1987

Four times chairman of Department search committees.

Member of Consultative Committee for Dean of Arts and Sciences, 2001

Member of College of Art and Sciences, academic standards committee, 2005-2007

Art and Science Physics Representative on the University Faculty Senate, 2006-2009

Research Council - current

DOCTORAL STUDENTS

1. M. Abella, **Study of the a.c. josephson effect in S-N point contacts**,
University of Miami, 1991

2. M. Naghashpour **Study of universal behavior for the single-ion Kondo effect** ,
University of Miami, 1991
3. L. Leong **Studies of a model for arc discharges** ,
University of Miami, 1993
4. H Preda, University of Miami, 2001

Honours and Awards:

American Physical Society “Outstanding Referee” 2010.

PUBLICATIONS.

- [1] **Hyperfine Splitting in a Metal of Localized Moment.**
S. E. Barnes, J. Dupraz and R. Orbach, J. Appl. Phys. **42** 1959 (1971).
- [2] **Generalization of the Drone Fermion Method.**
S. E. Barnes J. Phys. **C5** L178 (1972).
- [3] **Diagrammatic Analysis of the Dynamics of Local Moments in Metals.**
S. E. Barnes and J. Zitkova-Wilcox, Phys. Rev. **B7** 2163 (1973).
- [4] **Fine-Structure Splitting of a Localized Moment in a Metal: A Diagrammatic Analysis.**
S. E. Barnes, Phys. Rev. **B9** 4789 (1974).
- [5] **The Effect that Finite Lattice Spacing has upon the ESR Bloch Equations.**
S. E. Barnes, J. Phys. **F4** 1535 (1974).
- [6] **Dynamic EPR Susceptibility for the “Ionic” Approach to the Anderson Model.**
S. E. Barnes, J. Phys. **F6**, 115 (1976).
- [7] **On the Asymmetry in the Kondo Susceptibility.**
S. E. Barnes, J. Phys. **F6** L191 (1976).
- [8] **New Method for the Anderson Model.**
S. E. Barnes, J. Phys. **F6** 1376 (1976).
- [9] **On the Kondo Effect in the Dynamics of Local Moments.**
S. E. Barnes, J. Phys. **F6**, 1713 (1976).
- [10] **EPR Fine Structure of S-State Ions.**
M. Hardiman, J. Pellison and S. E. Barnes, pg. 71, Proc. IIInd. Conf. on Crystal Field Effects in Metals and Alloys. Plenum Press (1977).
- [11] **Justification of Ionic Approach to Local Moments.**

- S. E. Barnes, pg. 301, Proc. XIX Congress Ampere, North Holland (1977).
- [12] **Localizing Pseudopotential for Local Moments and Certain Virtual Bound States.**
S. E. Barnes, Phys. Rev. B **16** 4378 (1977).
- [13] **Spectroscopy of Type I Superconductors using Magnetic Impurity Relaxation of Josephson Junction Fiske Modes.**
S. E. Barnes, J. Phys. C **10** 2863 (1977).
- [14] **New Method for the Anderson Model II: The $U=0$ Limit.**
S. E. Barnes, J. Phys. F **7** 2637 (1977).
- [15] **Anomalous Crystal Field Splitting of Lanthanide S-State in Metals.**
S. E. Barnes, K. Baberschke and M. Hardiman, Phys. Rev. B **18** 2409 (1978).
- [16] **Crystal Field Splitting and Spin-Spin Interactions of Eu and Gd in LaAl_2 Single Crystals.**
K. Baberschke, S. E. Barnes and B. Bachor, J. Appl. Phys. **49** 1451 (1978).
- [17] **A Simple Model for the Resistive-Non-Resistive Transition in Granular Superconductors.**
S. E. Barnes, Phys. Lett. **66A**, 422 (1978).
- [18] **Compatibility of the Friedel-Anderson VBS and Ionic Approaches to the Theory of Magnetic Ions in Metals.**
S. E. Barnes, J. de Physique, **39** C5-828 (1978).
- [19] **RPE du Gd dans XMO_6S_8 , $\text{X} = \text{Pb}, \text{Sn}$.**
R. Odermatt, M. Hardiman, S. E. Barnes, J. Pellisson and M. Peter, Helv. Phys. Act. **52** 367 (1979).
- [20] **Electron Paramagnetic Resonance of Gd in Platinum.**
M. Hardiman, J. Pellisson, S. E. Barnes, P. E. Bisson and M. Peter, Phys. Rev. B **22** 2175 (1980).

- [21] **ESR of Eu:LaAl₂ Single Crystals: Crystal Fields and the Effective Exchange Interaction.**
K. Baberschke, S. E. Barnes and B. Bachor, J. Mag. and Mag. Mat. **15-18** 33, (1980).
- [22] **Crystal Field and Exchange Parameters in LaAl₂:Eu and LaAl₂Gd.**
K. Baberschke, B. Bachor and S. E. Barnes, Phys. Rev. B**21** 2666, (1980).
- [23] **On the Validity of the Resistively Shunted Josephson Junction Model for Small Area SNS Junctions in a Magnetic Field.**
S. E. Barnes, J. Appl. Phys. **51** 6438 (1980).
- [24] **Electron Spin Resonance Modes in a Spin-Glass.**
S. E. Barnes, Physics B+C **108** 771 (1981).
- [25] **Spin-Waves in a Spin-Glass.**
S. E. Barnes, J. Phys. F**11** L249 (1981).
- [26] **ESR Modes and the Edwards-Anderson Theory of the Spin-Glass State.**
S. E. Barnes, Phys. Rev. Lett. **47** 1913 (1981).
- [27] **Instabilities in the Edwards-Anderson Ground State for a Spin-Glass.**
S. E. Barnes, Phys. Lett. **87A** 121 (1981).
- [28] Review: **Theory of Electron Paramagnetic Resonance of Ions in Metals.**
S. E. Barnes, Advances in Physics **30** 801-938 (1981).
- [29] **An ESR Study of Local Moments and Conduction Electrons in ScGd.**
S. E. Barnes, K. Baberschke and J. Nagel, J. Phys. F**13** 347 (1982).
- [30] **Experimental Investigation of Magnetic Behavior of SNS Josephson Junctions.**
K. Bures, S. E. Barnes and K. Baberschke, J. Appl. Phys. **54** 7073 (1982).
- [31] **Magnetic Resonance in the Spin-Glass (LaGd):Al₂.**
M. Zomack, K. Baberschke and S. E. Barnes, Phys. Rev. B**27** 4135 (1983).

- [32] **ESR Study of Crystal Field Effects in (ErY)Al₂.**
V. Dobler, K. Baberschke and S. E. Barnes, Phys. Rev. B **27** 6593 (1983).
- [33] **Theory of Josephson-Type Oscillations in a Moving Charge-Density-Wave.**
S. E. Barnes and A. Zawadowski, Phys. Rev. Lett. **51** 1003 (1983).
- [34] **A Non-Mean-Field Interpretation of the Irreversibility Line in Spin-Glasses.**
A. P. Malozemoff, S. E. Barnes and B. Barbara, Phys. Rev. Lett. **51** 1704 (1983).
- [35] **ESR Relaxation in Spin-Glasses.**
S. E. Barnes, Phys. Rev. B **30** 3944 (1984).
- [36] **ESR and Magnetization of the Spin-Glass CuMn at Low Concentrations.**
F. R. Hoekstra, G.J. Nienwenhuys, K. Baberschke and S. E. Barnes, Phys. Rev. B **29** 1292, (1983).
- [37] **Microscopic Formulation for a Josephson Array.**
S. E. Barnes J. Phys. F **14** 1925, (1984).
- [38] **On the Field Dependence of the Spin-Glass Susceptibility Peak.**
B. Barbara, A. P. Malozemoff and S. E. Barnes, J. Appl. Phys. **55** 1655 (1984).
- [39] **A Scaling Approach to Spin Glass Phenomena.**
S. E. Barnes, A. P. Malozemoff and B. Barbara, Phys. Rev. B **30** 2765 (1984).
- [40] **ESR in Situe of a Josephson-Tunnel-Junction.**
K. Baberschke, K. D. Bures and S. E. Barnes, Phys. Rev. Lett. **53** 98, (1984).
- [41] **Non-Mean Field Generalization of the Gabay-Toulouse Line.**
S. E. Barnes, A. P. Malozemoff and B. Barbara, Proc. 17th Int. Conf. on Low Temp. Phys., pg. 645, ed. Eckern et al, North Holland, Amsterdam (1984).
- [42] **Dynamics of a Charge-Density-Wave in the Josephson Approach.**
S. E. Barnes, Proc. 17th Int. Conf. on Low Temp. Phys., pg. 1341, ed. Eckern et al, North Holland, Amsterdam (1984).

- [43] **ESR Spectroscopy in SNS Josephson Junctions.**
K.D. Bures, K. Baberschke and S. E. Barnes, Proc. 17th Int. Conf. on Low Temp. Phys., pg. 827, ed. Eckern et al, North Holland, Amsterdam (1984).
- [44] **Quantum Effects in the Josephson Approach to a CDW.**
S. E. Barnes, pg. 250, Charge Density Waves in Solids, Lecture Notes in Physics, Gu. Hutaray and J. Solyom (eds.), Vol. **8217**, (1985).
- [45] **Microscopic Theory of Interaction of CDW with Impurities.**
A. Zawadowski, I. Tutto, S. E. Barnes, P. F. Tua and J. Ruvalds, pg. 240, Charge Density Waves in Solids, Lecture Notes in Physics, Gu. Hutaray and J. Solyom (eds.), Vol. **217**, (1985).
- [46] **Solution of the Kondo Problem by Diagrammatic Methods.**
S. E. Barnes, Phys. Rev. Lett. **55** 2192 (1985).
- [47] **New Exact Diagram Approach to the Kondo Problem.**
S. E. Barnes, J. of Mag. and Mag. Materials., **54-57**, 1243-1244 (1985).
- [48] **ESR In Situe with a Josephson Tunnel Junction.**
K.-D. Bures, K. Baberschke and S. E. Barnes, Jour. of Mag. and Mag. Materials., **54-57**, 1415-1417 (1985).
- [49] **Derivation of Exact Results for the Single Ion Kondo Problem using Diagram Methods.**
S. E. Barnes, Phys. Rev. B**33**, 3209-3246 (1986).
- [50] **Theory of In Situe Measurements of Wave-vector Dependent Dynamic Susceptibility and ESR Spectroscopy using the A.C. Josephson Effect.**
S. E. Barnes and F. Mehran, Phys. Rev. B**34**, 4537-4537 (1986).
- [51] **Paramagnetic Resonance of Cu^{2+} in the Superconductor $\text{Y}_{0.2}\text{Ba}_{0.8}\text{CuO}_x$.**
F. Mehran, W. J. Gallagher, R. L. Sandstrom, and S. E. Barnes, Phys. Rev. B **36**, 740-742 (1987).
- [52] **Observation of $\text{Al}_2\text{O}_3\text{:Cr}^{3+}$ Magnetic Resonance via Solitons in Long Josephson Junctions.**

F. Mehran, S. E. Barnes, C. C. Chi, R. L. Sandstrom and C. P. Umbach, Rapid Comm. Phys. Rev. B**36**, 728 (1987).

[53] **Electron Paramagnetic Resonance of Gd^{3+} in the Superconductor $\text{GdBa}_2\text{Cu}_3\text{O}_x$.**

F. Mehran, S. E. Barnes, C. C. Tsuei and T. R. McGuire Rapid Comm. in Phys. Rev. B**36**, 7266 (1987).

[54] **Observation by electron spin resonance of a pseudo-cubic site in $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$.**

F. Mehran, S. E. Barnes, T. R. McGuire, T. R. Dinger, D. L. Kaiser and F. Holtzberg, Solid State Comm. **66**, 299 (1988)

[55] **Theory of the Jahn-Teller-Kondo effect.**

S. E. Barnes Phys. Rev. **37**, 3671 (1988)

[56] **Alternative Feynman Diagram Method for the General Spin Kondo Problem.**

S. E. Barnes, Phys. Rev. **37**, 2220 (1988)

[57] **Comparison of the EPR of the Antiferromagnetic Green Phase Compounds $(\text{Y}, \text{Gd})_2\text{BaCuO}_5$ and the High T_c Superconductors $(\text{Y}, \text{Gd})\text{Ba}_2\text{Cu}_3\text{O}_7$.**

F. Mehran, S. E. Barnes, E. A. Giess and T. R. McGuire Solid State Comm. **67**, 55 (1988)

[58] **Absence of excited triplets in the EPR of the high T_c superconductors and the anti-ferromagnetic insulator CuO**

F. Mehran, S. E. Barnes, G. V. Chandrashekhar, T. R. McGuire and M. W. Shafer, Solid State Comm. **67**, 1187-1189 (1988)

[59] **Excitations in a nearly half-filled Hubbard model with $U = \infty$.**

S. E. Barnes, Phys. Rev B**40**, 723-726 (1989)

[60] **Holon statistics**

S. E. Barnes, J. Phys. C.M. **1**, 2293 (1989)

[61] **Theory of positron annihilation in superconductors**

S. E. Barnes and M. Peter, Phys. Rev B**40**, 10 958 (1989)

- [62] **Unusual behavior of the Gd ESR in single crystals of $\text{Gd}_y\text{Y}_{1-y}\text{Ba}_2\text{Cu}_3\text{O}_{6+x}$ with $x = 0.1-0.8$ and $y = 0.03-0.06$: Evidence for a magnetic interaction in the superconductors.**
D. Shaltiel, S. E. Barnes, H. Bill, M. Francois, H. Hagemann, J. Jegondaz, D. Lovy, P. Monod, M. Peter, A. Revcolevschi, W. Sadowski and E. Walker, *Physica C***161**, 13-20, (1989).
- [63] **Spin disordered ground state for a nearly half-filled Hubbard model.**
S. E. Barnes, *Phys. Rev B***41**, 8991 (1990)
- [64] **All electronic Peierls instability in the infinite U mean-field theory for the Hubbard model**
S. E. Barnes, Rapid Communication, *Phys. Rev. B***41**, 11 701 (1990).
- [65] **Basic theory for 2D-ACAR of positrons from superconductors.**
S. E. Barnes, pg. 482-498 *Third International Workshop on Positron and Positronium Chemistry*, Ed. Y. C. Jean, World Scientific Publishing Co. Pte. Ltd. Singapore (1990).
- [66] **The t-J model: anyons, flux states, spinons, holons, and all that.**
S. E. Barnes, *Physica* **165&166**, 987-988 (1990)
- [67] **Flux states for the infinite U limit of the Hubbard model**
S. E. Barnes, *Phys. Rev.* **44**, 801, (1991).
- [68] **Theory of positron annihilation in the spinon-holon picture**
S. E. Barnes, *J. Phys. Chem. Solids* **52**, 1525-1533 (1991)
- [69] **Spinon-holon statistics and broken statistical symmetry for the t-J and hubbard models in 2D**
S. E. Barnes, in *High-Temperature Superconductivity*, pg. 95, ed. Ashkenazi et al., Plenum Press, New York (1991).
- [70] **The mixed state of a superlattice of superconducting sheets**
S. E. Barnes, *J. Phys. Condens. Matter* **4**, 4135-4147, (1992)
- [71] **What can positrons contribute to high- T_c superconductivity?**

M. Peter, T. Jarlborg, A. A. Manuel, B. Barbiellini and S. E. Barnes, Proc. Sagamore conference on electron spin and momentum densities in solids, Konstanz, Germany, September 2-6, (1991)

[72] **Non-universality in the Kondo effect**

M. Nagashpour and S. E. Barnes, Phys. Rev. Lett. **69**, 3824 (1992)

[73] **New auxiliary particle method for the Hubbard, t-J and Heisenberg models**

D. Vacaru and S. E. Barnes J. Phys. C.M. **6**, 719-728, 1994.

[74] **Application of generalized linear filters in data analysis**

S. E. Barnes, M. Peter, L. Hoffman, A. A. Manuel and A. Shukla, (invited contribution to special edition for 65 birthday of Philippe Choquard) J. Stat. Phys., **76** 679-701, 1994.

[75] **Implications of Fumi's theorem for auxiliary particle methods**

S. E. Barnes, Rapid Communications, Phys. Rev. B**51**, 10 213-10 216 (1995)

[76] **The ground state of the kagomé lattice - a new auxiliary particle approach**

S. E. Barnes, Czech. J. Phys. **46**-S4, 1907 (1996)

[77] **The Possibility of Flux Flow Spectroscopy**

S. E. Barnes, J. L. Cohn and F. Zuo, Phys. Rev. Lett. **77**, 3252 (1996)

[78] **Quantum Coherence in Small Antiferromagnets.**

S. E. Barnes, R. Ballou, B. Barbara and J. Strelén, Phys. Rev. Lett. **79**, 3252 (1997)

[79] **Intermediate spin and certain small magnets**

S. E. Barnes, J. Phys.: Condens Matter **10**, L665-L670 (1998).

[80] **Field-induced quasi-periodic coherence effects in certain small magnets.**

S. E. Barnes, cond-mat/9710302.

[81] **Efficient quantum computing on low temperature spin ensembles.**

S. E. Barnes, quant-ph/9804065.

- [82] **Theory of magnetic structure determination for small ferromagnets**
M. Preda and S. E. Barnes, J. Appl. Phys. **85**, 5630-5632
- [83] **Auxiliary Particles and Fumi's Theorem.**
S. E. Barnes, Physics B**259-261**, 179 (1999).
- [84] **Intermediate spin and quantum critical points.**
S. E. Barnes, cond-mat/9901219.
- [85] **Electronic structure of vortices in High T_c superconductors.**
S. E. Barnes, International Journal of Modern Physics B**13**, 3478-3481 (1999).
- [86] **Manifestation of intermediate spin for Fe_8**
S. E. Barnes, cond-mat/9907257
- [87] **Intermediate spin Schrödinger cat states and nano-magnets.**
S. E. Barnes, Phys. Rev. Lett. **87**, 167201 (2001)
- [88] **Re-examination of the role of the Kondo divergence in band formation for high T_c superconductors.**
S. E. Barnes, Physica C **364-365**, 127-130 (2001).
- [89] **A Jordan-Wigner transformation for the $t - J$ and Hubbard models with holes.**
S. E. Barnes and S. Maekawa, J. Phys. Cond. Matter **14** L19-L28 (2002)
- [90] **Bi-layer splitting in overdoped high T_c cuprates.**
S. E. Barnes and S. Maekawa, Phys. Rev. B**67**, 224513 (2003), *also* selected for the July 1, 2003 issue of the Virtual Journal of Applications of Superconductivity.
- [91] **Bi-and Tri-layer splitting in a new formulation of the t-J model of cuprates**
S. E. Barnes and S. Maekawa, Physica C: Superconductivity, **388-389**, 55-56 (2003)
- [92] **Current-driven domain wall motion in thin ferromagnetic wires**
S. E. Barnes and S. Maekawa, cond-mat/0311039 (2003)

- [93] **Physics of Transition Metal Oxides** S. Maekawa, T. Tohyama, S. E. Barnes, S. Ishihara, W. Koshibae and G. Khaliullin, Springer-Verlag, Berlin (2004).
- [94] **Currents induced by domain wall motion in thin ferromagnetic wires**, S. E. Barnes and S. Maekawa, cond-mat/0410021
- [95] **Current-spin coupling for ferromagnetic domain walls in fine wires**, S. E. Barnes and S. Maekawa, Phys. Rev. Lett. **95**, 107204 (2005).
- [96] **Concepts in Spin Electronics**, Chapter: *Theory of spin-transfer torque and domain wall motion in magnetic nanostructures*, S. E. Barnes and S. Maekawa, Ed. S. Maekawa, Oxford University Press, (2006).
- [97] **Spinmotive Forces and Torque Transfer in Spin Valves**
S. E. Barnes, AIP Proc. **850**, 1504 (2006).
- [98] **Spinons, Holons and Flux Tubes in a SU(3) Theory of High T_c Superconductors**
S. E. Barnes, AIP Proc. **850**, 561 (2006).
- [99] **Comment on “Theory of Current-Driven Domain Wall Motion: Spin Transfer versus Momentum Transfer”** S. E. Barnes, Phys. Rev. Lett. **96**, 189701 (2006).
- [100] **Magnetic memory and current amplification devices using moving domain walls**
S. E. Barnes, J. Ieda and S. Maekawa, Appl. Phys. Lett. **89**, 122507 (2006)
- [101] **Spin motive forces, “measurements”, and spin-valves**
S. E. Barnes, J. Mag. Mag. Mat. **310** 20352037 (2007)
- [102] **Generalization of Faraday’s Law to Include Nonconservative Spin Forces**
S. E. Barnes and S. Maekawa Phys. Rev. Lett. **98**, 246601 (2007) also published in the June 25, 2007 issue of Virtual Journal of Nanoscale Science & Technology

- [103] **Universality-Classes for Domain Wall Motion in the Ferromagnetic Semiconductor (Ga,Mn)As.**
M. Yamanouchi, J. Ieda, F. Matsukura, S. E. Barnes, S. Maekawa, and H. Ohno. *Science* **21** 1726-1729. (2007)
- [104] **Electromotive force and huge magnetoresistance in magnetic tunnel junctions**
Pham Nam Hai, Shinobu Ohya, Masaaki Tanaka, Stewart E. Barnes and Sadamichi Maekawa
Nature, **458**, 489-492, (2009). doi:10.1038/nature07879.
- [105] **Direct dynamical coupling of spin modes and singlet Josephson supercurrent in ferromagnetic Josephson junctions**
I. Petković, M. Aprili, S. E. Barnes, F. Beuneu, and S. Maekawa, *Phys. Rev. B* **80**, 220502(R) (2009) also in *Virtual Journal of Applications of Superconductivity* **17**, Issue 12 (15 December 2009)
- [106] **Electrical measurements of the polarization in a moving magnetic vortex**
Jun-ichiro Ohe, Stewart E. Barnes, Hyun-Woo Lee and Sadamichi Maekawa, *Appl. Phys. Lett.* **95**, 123110 (2009)
- [107] **Depinning of domain walls with an internal degree of freedom**
V. Lecomte, S. E. Barnes, J.-P. Eckmann and T. Giamarch, *Phys. Rev. B* **80**, 054413 (2009)
- [108] **Foundations of Quantum Mechanics in the Light of New Technology.** Article: **Current-induced domain wall creep in magnetic wires**
J. Ieda, S. Maekawa and S.E. Barnes, 134-137, " Proceedings of the 9th International Symposium on Foundations of Quantum Mechanics in the Light of New Technology", World Scientific, (2009)
- [109] **Ferromagnetic resonance with a magnetic Josephson junction.**
S E Barnes, M Aprili, I Petkovic and S Maekawa, *Supercond. Sci. Technol.* **24** 024020 (2011),
Invited paper for special edition on "hybrid magnetic superconducting systems". (Pre-print at: arXiv:1010.3858 [cond-mat.supr-con] 19 Oct 2010)
- [110] **Nano-Josephson-junction ferromagnetic resonance (FMR)**

S. E. Barnes, Nanotechnology **22** 45049 (2011)

<http://iopscience.iop.org/0957-4484/labtalk-article/45049>

[111] **Equation-of-motion approach of spin-motive-force.**

Yuta Yamane, Junichi Ieda, Jun-ichiro Ohe, Stewart E. Barnes, and Sadamichi Maekawa J. Appl. Phys. **109**, 07C735 (2011)

[112] **Spinmotive Force due to Intrinsic Energy of Ferromagnetic Nanowires**

Yuta Yamane, Junichi Ieda, Jun-ichiro Ohe, Stewart E. Barnes, and Sadamichi Maekawa, Applied Physics Express **4** 093003 (2011)

[113] **Continuous Generation of Spinmotive Force in a Patterned Ferromagnetic Film.**

Y. Yamane, K. Sasage, T. An, K. Harii, J. Ohe, J. Ieda, *S. E. Barnes*, E. Saitoh, and S. Maekawa, (pre-print: arXiv:1107.0549), Phys. Rev. Lett. **107**, 236602 (2011)

[114] **Noise and Topology in Driven Systems - an Application to Interface Dynamics**

Stewart E. Barnes, Jean-Pierre Eckmann, Thierry Giamarchi, Vivien Lecomte, (pre-print: arXiv:1105.2219v1), Nonlinearity **25** 14271441 (2012)

[115] **Spinmotive force due to a gyrating magnetic vortex** K. Tanabe, D. Chiba, J. Ohe, S. Kasai,

H. Kohno, S. E. Barnes, S. Maekawa, K. Kobayashi, T. Ono, Nat Commun **3** 845 (2012)

[116] **Theory of spin-motive-forces in ferromagnetic structures.** S. E. Barnes in “Spin Cur-

rent” eds Sadamichi Maekawa, Sergio O. Valenzuela, Eiji Saitoh and Takashi Kimura ISBN13: 9780199600380 (Oxford University Press, 2012)

[117] **Local Excitation of Magnetostatic Modes in YIG**, Elisa Papa, Stewart E. Barnes, and

Jean-Philippe Ansermet, IEEE TRANSACTIONS ON MAGNETICS, **49**, 1055, (2013)

[118] **Evidence for a Magnetic Seebeck Effect** Sylvain D. Brechet, Francesco A. Vetro, Elisa Papa,

Stewart E. Barnes, and Jean-Philippe Ansermet Phys. Rev. Lett. **111**, 087205 (2013)

[119] **Rashba Spin-Orbit Anisotropy and the Electric Field Control of Magnetism** Stewart E.

Barnes, Junichi Ieda, and Sadamichi Maekawa with referees *Nature Reports* October (2013)