

# David C. Jiles

Chair, Department of Electrical & Computer Engineering,  
Palmer Endowed Chair and Anson Marston Distinguished Professor  
Iowa State University, Ames, Iowa 50011, USA.

## 1. PROFESSIONAL EXPERIENCE

2010 -	Anson Marston Distinguished Professor, Chairman, Department of Electrical & Computer Engineering, Palmer Chair Holder, Iowa State University, USA
2005-2010	Professor of Magnetism, Director & Royal Society Research Fellow, Wolfson Centre for Magnetism, Cardiff University, UK
2003-2005	Anson Marston Distinguished Professor, Iowa State University, USA
2004	Visiting Professor, Wolfson Centre for Magnetism, Cardiff University, UK
2000, '03, '07	Visiting Professor, Vienna University of Technology, Austria
1999	Visiting Scientist, Institute of Physics, Czech Academy of Sciences
1997	Visiting Professor, University of the Saarland, Germany
1992-2005	Professor of Electrical & Computer Engineering, Iowa State University.
1992, 1997	Visiting Professor, Fraunhofer Institute, University of the Saarland, Germany.
1991, 1994	Visiting Professor, Department of Applied Physics, University of Hull, UK.
1990-2005	Professor of Materials Science & Engineering, Iowa State University.
1990-2005	Senior Scientist, Ames Laboratory US Department of Energy.
1986-90	Associate Physicist/Assistant Professor - Physicist/Associate Professor.
1984-86	Research Fellow, Ames Laboratory, US Department of Energy.
1981-84	Research Associate, Physics Department, Queen's University, Kingston, Canada.
1979-81	Postdoctoral Fellow, Physics Department, Victoria University, New Zealand.

## 2. LEADERSHIP AND MANAGEMENT EXPERIENCE

### Director, Wolfson Centre for Magnetism, Cardiff University, 2005-2010

As Director of this engineering research center for five years I reported to the Head of the School of Engineering (equivalent to the Dean of Engineering in a US university) and the Vice-Chancellor (equivalent to the President in a US university). I was responsible for setting policy for the Center and providing technical leadership for 6 tenure and tenure track academic staff, a further 10 professional and scientific staff in the center, and 20 graduate research students. Other responsibilities included policy making, setting the research direction of the Center, raising research funding to support the programs in the Center, liaising with external organizations including government (EPSRC, the Welsh Assembly Government, the Technology Strategy Board, and private industry. I chaired the external Advisory Board for the Center and had overall responsibility for an annual Center budget of £2 million (\$3.5 million at the prevailing exchange rates at the time) and an initial equipment budget of £1.5 million (\$2.6 million at the prevailing exchange rates at the time). As Center Director I also conducted annual appraisals of all faculty and staff in the Center, ensured timely progress of graduate student towards graduation, prepared and delivered lectures and courses at the undergraduate and master's degree levels, and created, initiated and supervised a new Master of Science course in Magnetism.

### Leadership Courses

While Director of the Wolfson Centre for Magnetism I completed the following leadership for senior academic administrators "*Practical Leadership for University Management*" a ten month part time course which included the following

1. Leadership and Delegation
2. Communicating Effectively
3. Planning and Controlling work
4. Leading Change and Implementing Strategy
5. Cardiff Approach to Project Management
6. Chairing University Appointment Panels
7. Conducting Academic Appraisals

## 8. Financial Framework of the University

### **Chair and DEO, Department of Electrical & Computer Engineering, Iowa State University, 2010-2015**

As Chair and Department Executive Officer for the last 5 years I have been responsible for providing leadership for 49 tenure and tenure track faculty, a further 10 adjunct or non-tenure track faculty and for hiring new faculty and staff. I have also been responsible for delivering the academic programs of the department, including three undergraduate programs (Electrical, Computer and Software engineering) and the graduate programs in Electrical & Computer Engineering. I have overall responsibility for managing a \$10 million per year departmental operating budget. I conduct annual evaluations for all faculty and some of the more senior staff in the department. I am responsible for interacting with industrial sponsors and potential sponsors and for raising funds from donors to the department. I am also responsible for planning, developing and improving the buildings and physical facilities for the department. For example I developed and carried out plans to construct 4 major new facilities in Coover Hall, the home of Electrical & Computer Engineering. These were: a multi-media giant electronic display screen at the main entrance to the building sponsored by Union Pacific and known as “Project Cyris”, a Student Services & Advising Center where students can meet with advisors and faculty in a purpose-built space, a student work and recreation space – known as the “Transformative Learning Area”, and a dedicated area for electronics and computer technical support for laboratories, now known as the Electronics Technology Group – “ETG”). A fifth construction project the Brayton Departmental Conference Center is in its initial stages.

### **Management**

- Practiced responsible management of the department, including stewardship of its fiscal, physical, and personnel resources.
- Promoted diversity in departmental activities, including recruiting, mentoring, and culture
- Recruited new faculty and staff, and developed mentoring and training plans for them.
- Conducted effective and meaningful performance reviews of departmental faculty and staff, including post-tenure reviews
- Conducted performance management of faculty to achieve improved research productivity.
- Promoted open communication, vertically in the department and across the College, University, and with external stakeholders.

### **Leadership**

- Articulated a vision for the department that was implemented through a strategic plan and is aligned with the goals of the College and the University.
- Enhanced the quality of research, education, and service in the department
- Supported faculty, staff and students in achieving their career aspirations.
- Promoted internationalization in departmental activities from the standpoints of curriculum, co-curricular activities, and research,
- Expanded relationships with the external advisory board, appointed new members and retired others.
- Expanded and nurtured alumni and donor relationships.

## **3. EDUCATION**

D.Sc. (1990) Physics, University of Birmingham  
Ph.D. (1979) Applied Physics, University of Hull  
M.Sc. (1976) Applied Nuclear Physics, University of Birmingham  
B.Sc. (1975) Physics & Mathematics, University of Exeter

## **4. TITLES OF THESES**

D.Sc. "Magnetic and electronic properties of metals"

- Ph.D. "Development of a new ultrasonic sing around system and its application to the investigation of magnetoelastic effects in some heavy rare earths"
- M.Sc. "Diamond as a viable radiation doserate meter"
- B.Sc. "Phase transitions in the aluminum rich region of the Al-Mn phase diagram"

## 5. SCIENTIFIC AND PROFESSIONAL SOCIETY MEMBERSHIPS

Fellow of the Royal Academy of Engineering (Elected 2014)  
 Honorary Fellow, Indian Society for Nondestructive Testing (Elected 2011)  
 Fellow of the Institute of Materials, Minerals and Mining UK (Elected 2007)  
 Fellow Japan Society for the Promotion of Science (Elected 2006)  
 Royal Society Research Fellow (2005)  
 Fellow of the Institute of Physics, UK (Elected 1988).  
 Fellow of the Institute of Electrical & Electronic Engineers (Elected 1994).  
 Fellow of the Institution of Electrical Engineers, UK (Elected 1995).  
 Fellow of the Magnetics Society (Elected 1994).  
 Life Fellow of the American Physical Society (Elected 1997).  
 Fellow of the Institute of Mathematics and its Applications, UK (Elected 1999).  
 Member American Society for Engineering Education.  
 Member American Association for the Advancement of Science  
 Member of the European Physical Society.

## 6. AUTHORSHIP OF BOOKS

*"Introduction to Magnetism and Magnetic Materials,"* by D.C. Jiles. 588 pages, Chapman and Hall Publishers, London and New York. First edition 1991. Second edition 1998, Third edition 2015.

*"Introduction to the Electronic Properties of Materials,"* by D.C. Jiles. 418 pages, Chapman and Hall Publishers, London and New York. First edition 1994. Second edition 2001.

*"Introduction to the Principles of Materials Evaluation",* by D.C. Jiles. 279 pages, Taylor and Francis, Boca Raton, Florida, 2007.

## 7. PROFESSIONAL ACTIVITIES, HONORS & AWARDS

Elected Fellow of the Royal Academy of Engineering (2014)  
 Included in "Who's Who" by A. & C. Black, publisher of the the original annual Who's Who since 1849 (2016)  
 Elected Member Board of Governors of IEEE-HKN (2013)  
 Honorary Fellow, Indian Society for Nondestructive Testing (2011)  
 Member HKN (eta-kappa-nu, the Electrical Engineering Honor Society) (2011)  
 Member TBPI (tau-beta-pi, the Engineering Honor Society) (2011)  
 Honorary Professor, School of Engineering, Cardiff University, UK  
 Visiting Professor, Department of Materials Science & Engineering, University of Sheffield, UK  
 Chairman, United Kingdom & Republic of Ireland Section, IEEE Magnetics Society (2009-10)  
 Fellow Japan Society for the Promotion of Science (2006)  
 Royal Society Research Fellow (2005-2010)  
 Ewing Distinguished Lecturer, UK Magnetics Society (2005)  
 Editor-in-Chief, IEEE Transactions on Magnetics (2005-2011)  
 Selected for inclusion in Marquis "Who's Who in the World", (2000, '01, '02, '03, '04, '05, '06, '07, '08, '09, '10, '11, '12, '13, '14, '15, '16)  
 Selected for inclusion in Marquis Who's Who in America", (2001, '02, '03, '04, '05, '06, '07, '08, '09, '10, '11, '12, '13, '14, '15, '16)  
 Selected for inclusion in Marquis "Who's Who in Science and Engineering" (1998, '99, 2000, '01, '02, '03, '04, '05, '06,

‘07, ‘08 , ‘09, ‘10, ‘11, ‘12, ‘13, ‘14, ‘15, ‘16)

Member of the International Advisory Committee, IUPAP International Conference on Magnetism (2000, 2003)

Magnetics Society Distinguished Lecturer (1997-98)

Chairman, American Physical Society Topical Group on Magnetism and its Applications (1996-97, 1997-98)

Program Committee International Magnetics Conference (1996, 1999, 2008)

Administrative Committee of the Magnetics Society (1996-1998, 1999-2001, 2003-2006, 2007-2009, 2012-14, 2016-18)

Member US Nuclear Regulatory Commission Expert Panel on NDE for Radiation Embrittlement (1999)

Federal Laboratory Consortium Award for Excellence in Technology Transfer (1994)

Editor of IEEE Transactions on Magnetics (1992-2004)

Editor of Nondestructive Testing & Evaluation (1988-2005)

ASM Committee on Hard and Soft Magnetic Materials, (1987-1997)

Chairman, Properties and Application of Magnetic Materials Conference (1985-2001)

Recipient of Iowa State University Foundation Award for Outstanding Achievement in Research (2001)

Editorial Board, Journal of Materials Science: Materials in Electronics (2002- )

Anson Marston Distinguished Professor, Iowa State University (2003- )

Chairman, American Physical Society Tutorials, (2003-2008).

## **8. PROFESSIONAL LICENCES**

1989-2015 PE Professional Engineer, State of Iowa

1989-2015 CEng Chartered Engineer, United Kingdom

## **9. RESEARCH PROJECTS, CONTRACTS AND GRANTS**

“Development of a Novel Triple Halo Coil for Deep Brain Stimulation”, D.C.Jiles and R.Hadimani, \$67,000, Galloway Foundation, 2015-16

“Magnetic Measurements and Modeling” , D.C.Jiles, R L.Hadimani, C. I. Nlebedim, Y. Melikhov, A. Porch, \$244,312. National Science Foundation, International Research Experience for Students (IRES), OISE 1357565, 2014-17

“Towards Room Temperature Surface States in Topological Insulators”, I.C. Nlebedim and D.C.Jiles, \$16,000, National Science Foundation, 2014-15.

“Improved magnetic materials for NMR sensor applications”, D.C. Jiles, \$167,490, Schlumberger-Doll, 2014-16

“A Laboratory for Deep Brain Stimulation for Diagnostic and Therapeutic Purposes using Electromagnetic and Ultrasonic Methods”, D.C.Jiles, T.Bigelow, A. Kanthasamy, \$536,005, Carver Trust, 2012-14.

“Application of Barkhausen Noise Method for Depth Profiling of Stress in Helicopter Transmission Gears”, \$140,688, Agusta Westland, 2012-15.

“High Sensitivity Probe for Magnetic Non-destructive Evaluation”, D.C.Jiles and N. Prabhu Gaunkar, \$15,000, American Society for Nondestructive Testing, 2013-2014.

“Topological Electromagnetic Sensors”, F. Xiu and D.C. Jiles, National Science Foundation, Division of Electrical, Communications and Cyber Systems, ECCS-1201883, \$295,008, 2012-15

“Magnetic Nondestructive Evaluations for Detection of Flaws”, D.C.Jiles, Sperry Rail International, UK, £110,436, 2010-2011

“Development of Energy Efficient Magnetic Cooling and Refrigeration”, Royal Academy of Engineering, UK,

Exchange Grant with India, £12,597, 2010-12.

“The Integrated Brain Imaging and Stimulation Project”, Welsh Assembly Government, UK, £194,285, 2010-2012.

“Development of magnetic torsion angle sensor”, Valeo GmbH, Germany, £19,485, 2009-10.

“Welsh Electromagnetics Network”, Welsh Assembly Government, UK, £99,776, 2009-2011

“Magnetic Metrology: Advanced Modelling and Measurements for Welsh Engineering Industries” Welsh Assembly Government, UK, £254,372, 2009-2012

“Magnetic characterization and micromagnetic simulation of nanowire arrays”, Royal Society, UK, £5,754, 2009-2011.

“Strategic Partnership Agreement”, Cogent Power Ltd., UK, £175,000, 2009-2012.

“Development of Magnetic Stimulation Devices for Medical Applications”, UK, £209,540, Welsh Assembly Government, 2008-10.

“Development of an Expanded Magnetic Metrology Service”, £19, 639, Welsh Assembly Government, UK, 2008.

“Endowed Lectureship”, Cogent Power Ltd., UK, £210,000, 2008-2011.

“Development of Barkhausen Noise Method for residual stress evaluation on helicopters components”, £47,500, Agusta-Westland, UK, 2008-09

“Royal Society Conference Travel Grant”, UK, £1,120, 2007.

"Characterization and modelling of magnetic materials for fault current limiters", £147,930, Zenergy Power Systems, California, USA. 2006 - 2009.

“Characterisation of Soft Magnetic Materials for Metering Current Transformers and Other Low Flux Density Applications”, with A.J.Moses and P.I.Anderson, EP/E006434/1. £399,712, EPSRC, UK, 2007-2010.

“Investigation of high magnetostriction materials for advanced sensors and actuators” with A.J.Moses and P.I.Williams, EP/D057094/1. £322,087 EPSRC, UK. 2006-2009.

“Development of Wolfson Magnetics Research Laboratories”, £1,500,000, Higher Education Funding Council of Wales, UK, 2006-2008.

“Investigation of new magnetoelastic-caloric materials for device applications”, The Royal Society, UK, £120,000, 2005-2010.

“New composite magnetoelastic materials with high stress sensitivity and low hysteresis“, National Science Foundation, Division of Materials Research, DMR-0402716, \$473,299, 2004-2008.

“Development of magnetic filtering for fine metal particles using finite element method” with S.J. Lee and D.M. O’Neel, Institute for Physical Research and Technology, \$19,558, 2004.

“US-UK Cooperative Research: New composite magnetoelastic materials with high stress sensitivity and low hysteresis“, International Cooperative Project with Cardiff University, UK. National Science Foundation, Division of International Programs, OISE 0437293, \$24,995, 2004-2007.

“Magnetic measurement system for determination of magnetoresistance, hysteresis and magnetostriction of new spintronic materials”, \$425,000, Carver Trust, 2004-2006.

“Application of a magnetooptic sensor for nondestructive evaluation”, \$35,697, National Aeronautics and Space Administration, 2003-04.

“The piezomagnetic Matteucci effect in nickel”, NSF/REU, \$5,000, 2003.

“Magnetic sensors for integrated vehicle health monitoring”, \$50,500, National Aeronautics and Space Administration, 2003-04.

“A novel approach to characterizing surface residual stress in engine alloys using alternating current potential drop measurements” USAF, with M. Johnson and S.J. Lee, 2003-2004.

“CRCRD: Vertically Integrated Engineering Design”, NSF/REU, \$5,000, 2003

“Magnetic sensors for integrated vehicle health monitoring”, \$75,500, National Aeronautics and Space Administration, 2002-03.

“Magnetic evaluation of fatigue damage and deformation”, INT-0138400, \$25,000, International Cooperative Project with the National Metallurgical Laboratory, Jamshedpur, India. National Science Foundation, US- India Cooperative Research Program, 2002-2007.

“Development of miniature pumps mixers and based on magnetically induced flow of magnetic liquids”, with R.Shinar and M.Porter, State of Iowa, \$146,051, 2002-2003.

“Magnetic Particle inspection improvements for aerospace applications”, with B.Larsen L.Brasche et al., Center for NDE, \$485,282, Federal Aviation Authority, 2001-2004.

“Magnetic properties of PrNiSi alloys”, US Department of Energy, \$103,000 (2002-2003), \$12,500 (2003-2004), \$121,000 (2004-2005), US Department of Energy.

"Extraordinary responsive magnetic rare earth materials," K.A. Gschneidner, Jr., V.K. Pecharsky, D.C. Jiles, et al., \$4,987,000, (2000), \$70,000 (2000-2001), \$70,000, (2001-2002), \$70,000 (2002-2003), \$70,000 (2003-2004), \$75,000 (2004-2005). US Department of Energy.

“Magnetization, time dependent magnetization processes and domain wall motion”, US Department of Energy. \$107,000 (1999-2000), 97,500 (2000-2001), \$110,000 (2001-2002).

"Laboratory for magnetic thin film and magnetoelectronic device research", \$530,000, Roy. J. Carver Trust, 2000-03.

"New magnetic tunnel junctions using semiconductor sandwich layers with controllable band gaps", ECS-0100799, \$54,802, J.E. Snyder, D.C. Jiles, National Science Foundation, 2001-2002.

“Analysis of relationships between magnetic hysteresis parameters and defects of non-uniform materials using the Preisach model”. DGE-0108046, \$49,926, NSF-NATO postdoctoral fellowships in science and engineering for scientists from NATO partner countries. D.C.Jiles and C.C.H.Lo. National Science Foundation, 2001-2003.

"Vertically integrated engineering design for combined research and curriculum development", EEC-9980331, with R.B.Thompson, K.Constant, M.Akinc, J.Gray and L.W. Schmerr, \$443,968, National Science Foundation, 1999-2003.

"Magnetic FEM course modules and demonstrations," S.-J. Lee, D.C. Jiles, \$5,000, Ansoft Corporation, 2000.

"Animation of magnetic fields from two different shaped magnet arrays used for magnetic therapy", \$6,830, Vector Fields Inc., 2000.

"Magnetic processing for enhancement of lifetimes of ferrous metals subjected to repeated stress", CMS-9910147, \$49,940, National Science Foundation, 1999-2000.

"The piezomagnetic Matteucci effect in nickel alloys: development of theory and applications", DMR-9902415, \$433,144, National Science Foundation, 1999-2002

"Non destructive enhancement of material lifetimes by stress reduction in ferrous metals without associated microstructural changes", IPRT Seed Fund Program, \$65,128, 1999-2000.

"Development of highly efficiency rotary magnetocaloric refrigeration prototype", \$750,000 (with K.A.Gschneidner and V.Pecharsky), US Department of Energy, 1999-2002.

"Development of vehicle magnetic air conditioner technology", \$50,000, US Department of Energy, CARAT Program, 1998.

"Modeling of magnetization processes in magnetic materials for evaluation of microstructures", OISE-9732135, \$23,681, International Collaborative project with the Academy of Sciences of the Czech Republic, National Science Foundation 1998-2001.

"Development of orthogonal magnetics", Rockwell International, \$25,000, 1998

"Characterization of the magnetic and structural properties of recording head materials", with J.Shinar, R.Weber and J.E.Snyder, Seagate Technology Inc., \$200,000, 1997-98.

"Composite magnetostrictive materials for advanced automotive magnetomechanical sensors", US DoE, Advanced Energy Projects, \$820,000, 1996-99.

"Examination of the relationship between magnetic hysteresis and the mechanical properties of steels", CMS-9532056, \$244,050, National Science Foundation, 1996-2001.

"Ferrite substrates for miniaturization of power electronics", Rockwell International and the State of Iowa, \$65,000, 1996.

"Research experiences for undergraduates grant for examination of the relationship between magnetic hysteresis and the mechanical properties of steels " National Science Foundation, \$5,000, 1997-98.

"Physical interpretation and comparison of hysteresis in magnetic materials", NATO, \$8,600, 1996-98.

"Laser scribing of metallic glasses to improve efficiency of electric motors and transformers", DMI-9622649, \$90,000, National Science Foundation, 1996-98.

"Research experiences for undergraduates grant for: Improved manufacturing processes for the production of new high efficiency materials for transformer cores " National Science Foundation, \$5,000, 1996-97.

"Loss reduction in metallic glasses through domain refinement", Asea Brown Boveri, \$40,000, 1996-97.

"New amorphous magnetic fibers for highly energy efficient soft magnetic cores", US Department of Energy, \$20,000, 1996.

"Assessment of Barkhausen effect measurements for evaluation of ground steel components", EEC-9418363, \$55,000, National Science Foundation, 1994-96.

"Research experiences for undergraduates for: Assessment of Barkhausen effect measurements for evaluation of ground steel components" National Science Foundation, \$5,000, 1995-96.

"Tailored microstructures in hard magnets," R.W.McCallum, I.E.Anderson, P.Canfield and D.C.Jiles. US Department of Energy, \$60,000, 1994-95, \$50,000, 1995-96.

"Development of the Magnescope as an instrument for in situ evaluation of steel components," Nuclear Regulatory Commission, \$99,998, 1994-97.

"An investigation of the effects of creep on structure sensitive magnetic properties of nickel through simulated cavitation in a model material," National Science Foundation, DMR-9310273, \$295,273, 1994-97.

"Research experiences for undergraduates for: An investigation of the effects of creep on structure sensitive magnetic properties of nickel through simulated cavitation in a model material " National Science Foundation, \$5,000, 1995-97.

"Characterization of magnetic property changes due to creep damage in pipe weldments," Electric Power Research Institute, \$39,525, 1995.

"Development of a new magnetostrictive material for sensors and actuators," US Department of Energy (Cooperative Research and Development Agreement with General Motors Corporation), \$67,422, 1994-95.

"Micromagnetic method for evaluation of residual stress in crankshaft fillets," Cummins Engine Company, \$34,883, 1994-5.

"Effects of processing and structural modifications on magnetic properties of high permeability, low core loss materials," US Department of Energy (Cooperative Research and Development Agreement with ABB Inc.), \$40,000, 1993-94.

"Effects of laser scribing on the core losses in silicon iron laminations," \$25,000, Asea Brown Boveri, 1993-94.

"Magnetic NDE for railroad wheel inspection programs," Association of American Railroads, \$39,919, 1993-94.

"Exploratory research on the effect of creep damage on magnetic properties in ferritic steels," \$37,400, Electric Power Research Institute, 1993-94.

"Laser magnetic domain refinement of transformer cores," P.Molian and D.C.Jiles, Electric Power Research Center, \$17,500, 1993-94.

"Magnetostriction in Tb-Dy-Fe alloys: measurement and modelling of properties," \$5,900, NATO, 1993-95.

"Magnetic inspection of creep damaged components in power generating systems," D.C.Jiles and S.B.Biner. Ontario Hydro, \$58,600, 1992-93.

"Rapidly solidified magnetic materials for highly efficient energy conversion devices," D.C.Jiles, I.E.Anderson, P.Molian and M.R.Govindaraju. State of Iowa, Institute for Physical Research and Technology, \$63,600, 1992-93.

"Magneprobe: a micromagnetic inspection system for inspection of surfaces," US Department of Commerce, \$242,000, 1991-93.

"Quantitative NDE for steel components of large structural systems", MSS-9018532, \$249,995, D.C.Jiles and S.B.Biner, National Science Foundation, 1990-1992.



"Magnetic properties measurements of irradiated, aged and prestrained materials (continuation)," D.C.Jiles. Westinghouse Electric Corporation, \$10,440, 1992.

"Detection of fatigue damage in aircraft landing gears," D.C.Jiles. McDonnell Douglas Aircraft Corporation, \$8,400, 1992.

"Prediction of changes in the magnetic properties of steels due to mechanical deformations," D.C.Jiles and M.J.Sablik, Electric Power Research Institute, \$221,797, 1990-92.

"Magnetostriction in Tb-Dy-Fe alloys: measurement and modelling of properties". D.C.Jiles and R.D.Greenough, North Atlantic Treaty Organization, \$4,900, 1991-1993.

"Magnetic properties measurements of irradiated, aged and prestrained materials". D.C.Jiles. Westinghouse Electric Corporation, \$10,164, 1991

"Creep damage assessment of Cr-Mo steels using magnetic methods". D.C.Jiles Ontario Hydro \$6,700, 1991.

"A Terfenol laser diode magnetometer," D.C.Jiles and R.Weber. US Department of Commerce, Center for Advanced Technology Development, \$29,989, 1991-92.

"Application of a new magnetic monitoring technique to in situ evaluation of fatigue damage in ferrous components of nuclear primary systems," D.C.Jiles and S.B.Biner. Nuclear Regulatory Commission, \$99,980, 1991-1993.

"Micromagnetic surface studies of materials for NDE," MSS-8915428, \$55,500, International Cooperative Project with the Universitat des Saarlandes, Germany, National Science Foundation, 1990- 92.

"Magnescope: a portable magnetic inspection system". Center for Advanced Technology Development, \$90,000, 1990-91.

"Development of NDE measurement techniques of interest to the railroad industry". Association of American Railroads, \$9,910, 1990.

"Non destructive methods for determination of mechanical properties of materials." Center for NDE, (NSF/Industrial Consortium, \$28,811 1985-86; \$45,214 1986-87; \$43,500 1987-88; \$58,000 1988-89; \$63,859 1989-90; \$60,560 1991-92)

"Magnetic methods for non destructive evaluation." Center for NDE, (N.S.F./Industrial Consortium \$16,357 1985-86; \$43,723 1986-87;\$47,500 1987-88; \$71,020 1988-89; \$61,426 1989-90, \$63,800 1993-94)

"NDE Measurement techniques." U.S. Department of Energy, Ames Laboratory, (Department of Energy B.E.S. Contract to Ames Laboratory for NDE Measurement Techniques, \$500,000 1984-85, \$552,000 1985-86 with O.Buck and R.B.Thompson).

"Microstructural effects on magnetic properties." U.S. Department of Energy, Ames Laboratory, (\$87,000 1988-89, \$85,400 1993-94, \$85,000 1994-95, \$85,000 1995-96. Funded as part of the NDE measurement techniques task).

## **10. OTHER RESEARCH PROJECTS**

"Investigation of the effects of mechanical stress on the magnetic properties of pipeline steels for stress monitoring", Queen's University, Canada (1981-84).

"Optical properties and electronic structure of Al, Au, Ni, Pt, Er, Gd, and Dy, using stress modulated spectroscopy." Victoria University, New Zealand (1979-81).

"Ultrasonic investigation of the magnetic and elastic properties of heavy rare earth metals at cryogenic temperatures". University of Hull, U.K., (1976-79).

"Utilisation of diamond as a solid state nuclear doserate-meter." University of Birmingham, U.K., (1976).

"X ray diffraction studies of metallurgical phases in the aluminum-manganese alloy system." University of Exeter, UK, (1974-75).

## 11. TEACHING

### *Academic areas of specialization :*

- Magnetism and magnetic materials
- Condensed matter and materials physics
- Electronic properties of materials
- Nondestructive evaluation of materials

### *Courses of instruction :*

- Electronic Engineering Laboratory, University of Hull, UK (1977-79)
- Applied Physics Laboratory, University of Hull, UK (1977-79)
- Experimental Physics Laboratory, Victoria University, New Zealand (1980-81)
- Applied Magnetism, Queen's University, Canada (1982)
- Nondestructive Evaluation Laboratory, Iowa State University (1985-87)
- Magnetism & magnetic materials, Iowa State University (1988-99, 2001, 2002, 2004, 2011)
- Introduction to electronic properties of materials, Iowa State University (1990-97, 2001, 2015)
- Electronic properties of materials, National Technological University (1993)
- Fabrication and processing of materials, Iowa State University (1997)
- Introduction to magnetic materials, University of the Saarland, (1997)
- Introduction to Materials Science and Engineering, Iowa State University (1997, 1999, 2002, 2003)
- Magnetism and Magnetic Materials, National Technological University (2001)
- Principles of Nondestructive testing, Iowa State University (1998-99, 2000-2003, 2005)
- Magnetic hysteresis modeling, Vienna University of Technology (2000)
- Vertically integrated design, Iowa State University (2000, 2001, 2002)
- Magnetic materials: applications in sensors and actuators, Vienna University of Technology (2003)
- Electrical Machines, Cardiff University (2005, 2006, 2007)
- Engineering Design Case Studies, Cardiff University (2006, 2007, 2008)
- Introduction to Magnetic Materials (2007, 2008, 2009)
- Avanced Magnetic Materials, Cardiff University (2009, 2010)
- Principles of Nondestructive Evaluation, Cardiff University (2009)
- Magnetism & magnetic materials, Iowa State University (2011, 2012, 2013, 2015)

### *Postdoctoral fellows sponsored and scientific staff supported*

- M.R.Govindaraju, Associate Metallurgist (1992-97)
- A.P.Parakka, Assistant Engineer (1994-97)
- A.Mitra, Visiting Scientist (1996)
- J.E.Snyder, Associate Scientist (1997-2005)
- M.J.Johnson, Associate Engineer (1997-1999)
- C.C.Lo, Associate Scientist (1998-2005)
- S.J.Lee, Postdoctoral Fellow (1999-2005)
- Y.Melikhov, Postdoctoral Fellow (2002-2005)
- N.Ranvah, Postdoctoral Fellow (2009-10)
- C.I. Nlebedim, Postdoctoral Fellow (2010-13)

R. Hadimani, Postdoctoral Fellow (2011-14)

*Graduate students :*

*Iowa State University 1984-2005*

Suresh Hariharan (Electrical Engineering, MS 1990)  
Michael Devine (Materials Science & Engineering, MS 1992)  
Alan Eichmann (Electrical Engineering, MS 1992)  
Levent Sipahi (Physics, MS 1992)  
Jennifer Thaelke (Physics, MS 1992)  
David Kaminski (Materials Science & Engineering, MS 1994)  
Russell Chung (Electrical Engineering, MS 1991, PhD 1999)  
Patricia Pulvirenti (Materials Science & Engineering, MS 1996)  
Zhao Jun Chen (Electrical Engineering, PhD 1994 ) \*  
Andrew Strom (Materials Science & Engineering, MS 1994)  
Mark Negley (Electrical Engineering, MS 1997)  
Zhan Gao (Electrical Engineering, MS 1995)  
Achal Ramesh (Materials Science & Engineering, MS 1996)  
Ying Bi (Electrical Engineering, MS 1997, PhD 1998) \*  
Drew Delaney (Materials Science and Engineering, with T.Lograsso, MS 1998)  
Hui Cao (Materials Science & Engineering, MS 1998)  
Ruoqi Chen (Electrical Engineering, MS 1999)\*  
Yonghua Chen (Materials Science & Engineering, PhD 1999)  
Fei Tang (Materials Science & Engineering, MS 1999)  
Bin Zhu (Electrical Engineering, PhD 2001)\*  
Mangui Han (Materials Science & Engineering, MS 2002, PhD 2004)  
Yuping Shen (Materials Science & Engineering, MS 2003)  
#Jeff Leib (Materials Science & Engineering, MS 2003)  
Junyoul Lee (Electrical & Computer Engineering, MS 2003)  
Lu Li (Electrical & Computer Engineering, MS 2003, PhD 2004)  
Bryan Baker (Materials Science & Engineering, MS 2003)  
Jason Paulsen (Mechanical Engineering, MS 2004)  
Sang Hoon Song (Materials Science & Engineering, MS 2005, PhD 2007)  
Emily Kinser (Materials Science & Engineering, MS 2005)  
Andrew Ring (Information Technology, MS 2006)

*Cardiff University 2005-2010*

George Katranas (EEE, PhD, 2006)  
Osama Alasamar (EEE, MS, 2009)  
Ravi Hadimani (EEE, PhD 2009)  
Naresh Ranvah (EEE, PhD 2010)  
Arun Kumar (EEE, PhD 2010)  
Esaindang Umenei (EEE, PhD 2010)  
Nikhil Sawant (EEE, MS, 2010)  
Orfeas Kypris (EEE, MS, 2010)  
Lukasz Mierczak (EEE, PhD 2015)

*Iowa State University 2010-*

\* Lawrence Crowther (EE PhD 2014)  
\* Orpheus Kypris (EE, PhD 2014)  
Ahmet Unsal (EE, PhD, 2014)  
Yan Ni (EE PhD, 2016)

+Neelam Gaunkar (EE MS, 2014, PhD 2016)  
Alexandria Benson (EE, MS, 2013)  
Rachna Kaul (EE, MS, 2014)  
Pratik Wagh (MSE, MS, 2014)  
Helena Khazdozian (EE, PhD 2016)  
Priyam Rastogi (EE, PhD, 2017)  
Xiaojing Zhong (EE, PhD, 2018)

\* Winners of Iowa State University Research Excellence Award for thesis work

# Winners of National Science Foundation Graduate Research Fellowship

+ Winners of Iowa State University Teaching Excellence Award

*External examiner for the following students :*

Thomas Koble (PhD), University of the Saarland, Germany (1992).  
Jonathan Makar (PhD), Queen's University, Canada (1993).  
Ian Reed (PhD), University of Hull, United Kingdom (1994).  
Brian Phelps (PhD), Queen's University, Canada (1997).  
Matthias Linde (MS), University of the Saarland (1998).  
Neil Munns (MSc), University of Hull, United Kingdom (2000).  
Ashis Panda (PhD), Indian Institute of Technology, Kharagpur, India (2002).  
George Loisos (PhD), University of Cardiff, United Kingdom (2002).  
Julian Dean (PhD), University of Sheffield, (2007)  
Seema Kumari (PhD), Bengal University of Engineering, India, (2007)  
John Wilson (PhD), University of Newcastle-upon-Tyne, (2009)  
David Ribbenfjard (PhD), Royal Institute of Technology, Sweden (2010).  
Partha Sarkar (PhD), Bengal University of Engineering, India (2013)  
Peter Haumer (PhD), Vienna University of Technology, (2013)

*Internal thesis examiner for the following students*

Ram Deshmukh PhD, Cardiff University, 2008  
Xiao Jun Di PhD, Cardiff University, 2008  
Mimi Thant, PhD, Cardiff University, 2008  
Juan Saguarday, PhD, Cardiff University, 2009  
Harshad Patel, PhD Cardiff University 2009  
Ming Huang PhD Cardiff University 2009

*Member of program of study committee for :*

Gregory Ojaard (PhD Materials Science and Engineering 1991)  
Jason Harp (MS Chemistry 1994)  
Alessandro Leon (PhD Chemistry 1995)  
Di Wang (MS Physics 1997)  
Tad Calkins (PhD Mechanical Engineering 1997)  
Robert Henning (PhD Chemistry 1998)  
Gregory Kobidze (PhD, Electrical Engineering, 1998)  
Paul Stucky (PhD, Electrical Engineering 1998)  
Guizhong Liu (MS Materials Science & Engineering, 2000)  
Marcello Dapino (PhD, Mechanical Engineering, 1999)  
Paul Maggard (PhD Chemistry, 2000)  
Zhang Ruili (MS Electrical Engineering, 1999)  
Wei Zhang (MS Materials Science & Engineering, 2000)  
Peter Guschl (MS Chemical Engineering, 2000, PhD Chemical Engineering 2002)  
Bryan Oliver (MS Electrical and Computer Engineering, 1999, PhD Electrical and Computer

Engineering)  
Russell Cusick (PhD Electrical and Computer Engineering)

*International exchange students :*

Steven Hardwick (Physics Dept, University of Warwick, UK 1992)  
Gary Williams (Applied Physics Dept., University of Hull, UK, 1992)  
Martino LoBue (Politecnica di Torino, Italy, 1994)  
Jonathan Roderick (University of Warwick, UK, 1995)  
Matthias Linde (University of the Saarland, Germany, 1997)  
Zhenya Melikhov (Charles University, Prague, Czech Republic 1999)  
Alexei Perevertov (Charles University, Prague, Czech Republic, 2000)  
K.M.Koo (Chinese University, Hong Kong, 2001)  
S. Wu (Chinese University, Hong Kong, 2002)  
Stefan Kreuz (University of Karlsruhe, Germany, 2006)  
Lukasz Mierczak (Czestohowa University, Poland, 2007)  
Konstantin Porzig (University of Ilmenau, Germany, 2012)  
Robert Uhlig (University of Ilmenau, Germany, 2012)

*Undergraduate research students :*

*Iowa State University 1990-2007*

Peter Schuster (Electrical Engineering) 1990-91  
Tony Peterson (Physics) 1991  
Bryce Kagay (Electrical Engineering) 1991  
Brent Moore (Electrical Engineering) 1992  
John Apostol (Electrical Engineering) 1992  
David Chandler (Electrical Engineering) 1992  
Jonathan Baker (Electrical Engineering) 1992  
Paul Searls (Aerospace Engineering) 1992-93  
James Gregory (Electrical Engineering) 1993  
Edward Rios (Electrical Engineering) 1993  
Matt Sosa (Physics) 1994  
Chris Rode (Computer Engineering) 1994  
Bryan Hall (Physics, Michigan Technical University) 1994  
Scott Beckman (Materials Science & Engineering) 1994-95, 1997  
Wayne Kinyon (Materials Science & Engineering) 1994-95  
Kenneth Bratland (Materials Science & Engineering) 1994-95  
Jennifer Dolan (Electrical Engineering/Physics) 1995  
Teresa Gansemer (Mechanical Engineering) 1996  
John Meyers (Materials Science & Engineering) 1996-97  
Jill Batey (Materials Science & Engineering) 1996-97  
Brynne Kriegermeier (Materials Science & Engineering) 1997-2000  
# Brandon Verbrugge (Electrical Engineering) 1997  
Dana Falzgraf (Materials Science & Engineering) 1997  
Liap Su (Materials Science & Engineering) 1997  
Steven Fan Fung (Electrical Engineering) 1998  
Melinda Goossen (Humboldt State University) 1998  
Andrew Ring (Mechanical Engineering) 1998-2002  
+ John Kenkel (Electrical Engineering) 1999-2002  
Laura Kerdus (Industrial Engineering) 1999-2001  
\* @Jeffrey Lieb (Materials Science & Engineering) 1999-2002  
Aaron Bakke (Materials Science & Engineering) 2000  
Aaron Schlager (Materials Science & Engineering) 2000

Jason Paulsen (Mechanical Engineering) 2000-2002  
 David Doty (Computer Engineering) 2000  
 Cory Lubahn (Computer Engineering) 2000-2001  
 Joe Bruner (Computer Engineering) 2000  
 Stephanie Connor (Materials Science & Engineering) 2000-01  
 Emily Kinser (Materials Science & Engineering) 2000-03  
 Heath Reimers (Materials Science & Engineering) 2000, 2002  
 Eric Straw (Materials Science & Engineering) 2000  
 Jessica Woolm (Materials Science & Engineering) 2000  
 Meredith Berger (Materials Science & Engineering) 2000  
 Kim Brueske (Materials Science & Engineering) 2000-01  
 David Eisenman (Materials Science & Engineering) 2000-01  
 Gabriel Weigelt (Materials Science & Engineering) 2001  
 Darrel Enyart (Materials Science & Engineering) 2001-02  
 Scott Hentscher (Materials Science & Engineering) 2001-02  
 Jacob Auliff (Materials Science & Engineering) 2001-02  
 Nick Olson (Electrical and Computer Engineering) 2002  
 Kurtis Kenne (Electrical and Computer Engineering) 2002  
 Kira Campos-Anderson (Materials Science & Engineering), 2002  
 Bryan Baker (Materials Science & Engineering), 2002-03  
 Tony Barsic (Electrical and Computer Engineering) 2004-05  
 Chris Hess (Materials Science & Engineering) 2004  
 Paul Matlage (Materials Science & Engineering) 2004-05  
 Ritesh Desai (Electrical and Computer Engineering) 2004  
 Hattie Ziegler (Physics) 2004-05  
 Courtney Slach (Materials Science & Engineering) 2004-05  
 Seth Aldini (Materials Science & Engineering) 2006  
 Paul Radke (Materials Science & Engineering) 2007

# Winner of Philip H. Trickey Prize, National Award for Undergraduate Research

+ Winner of the Mal Iles Technology Innovation Award 2002

\* Winner of the Iowa State University Student of Distinction Award 2002

@ Winner of the 2003 Outstanding Senior Undergraduate of the Year Award

#### *Cardiff University 2005-2010*

Ceri Shave (EEE), 2006  
 Nikhil Sawant (EEE), 2006  
 Liam Jones, MEng, (EEE), 2008-9  
 Matthew Perry, MEng, (EEE), 2008-9  
 Lloyd Dowden, MEng, (EEE), 2008-9  
 Steve Kinnard, MEng, (EEE), 2008-9  
 Lawrence Crowther, MEng, (EEE), 2008-9  
 Nelo Dehghan, MEng, (EEE), 2008-9  
 Agbortoko Mbiwan, MEng, (EEE), 2008-9  
 Haneef Nasir, MEng, (EEE), 2008-9  
 Andrew Ahabue, BEng (EEE), 2008-09  
 Sarah Gooding, MEng (EEE), 2008-09  
 Sarah Maber, MEng (EEE), 2009-10  
 Mohamed Hakem, MEng (EEE), 2009-10  
 Mark Atkinson, MEng (EEE), 2009-10  
 Rhydian Jones, MEng (EEE), 2009-10  
 Robbie Cooper, BEng (EEE), 2009-10

Raymond Hlatwayo, BEng (EEE), 2009-10

*Iowa State University 2010-*

Maria Peters (Materials Science & Engineering) 2011  
Mengqian Ding (Electrical and Computer Engineering) 2011  
Matthew Murphy (Electrical and Computer Engineering) 2012  
Haisheng Xu (Materials Science & Engineering) 2012-13  
Rachana Kaul (Electrical and Computer Engineering) 2012-13  
Rajnikant Singh (Electrical and Computer Engineering) 2012-14  
Daniel Yiwen Meng (Electrical and Computer Engineering) 2012-14  
Daniel Stiner (Electrical and Computer Engineering) 2012-14  
#Stephen March (Electrical and Computer Engineering) 2012-13  
Michael Senter (Electrical and Computer Engineering) 2012-13  
Spencer McAtee (Electrical and Computer Engineering) 2012-13  
Kris Spoth (Electrical and Computer Engineering) 2012-13  
Morgan Benson (Electrical and Computer Engineering) 2013-14  
Zhengpei Ding (Electrical and Computer Engineering) 2013-14  
Wyatt Lauer (Electrical and Computer Engineering) 2014  
David Kirpes (Electrical and Computer Engineering) 2014  
Xiaoyu Che (Electrical and Computer Engineering) 2014  
Chris Whitmore (Materials Science & Engineering) 2014  
Erik Lee (Electrical and Computer Engineering) 2014  
Matthew Backes (Electrical and Computer Engineering) 2014-5  
Joseph Bendict (Electrical and Computer Engineering) 2014-15  
Shane Harstad (Electrical and Computer Engineering) 2014-15  
Jeremy Rurup (Electrical and Computer Engineering) 2014-15  
Nicolas Robins (Electrical and Computer Engineering) 2014-15  
Richard Korneisel (Materials Science & Engineering) 2015

# Winners of National Science Foundation Graduate Research Fellowship

*Departmental external examiner*

Physics Department, University of Pertanian, Malaysia, 1996.

*Examiner for faculty promotions at the following universities:*

University of Tasmania, Australia (1994)  
Vienna University of Technology, Austria (1995)  
University of Bath, UK (1996)  
University of Salford, UK (1997)  
University of Hull, UK (1996, 1998)  
University of Pertanian, Malaysia (1997-2002)  
Queens University, Canada (1999)  
Trinity College, Dublin, Ireland (2004)

## **12. POSTGRADUATE THESES SUPERVISED**

1. "Development of instrumentation for magnetic nondestructive evaluation." S.Hariharan, MS, Iowa State University 1990.
2. "A laser diode magnetostrictive Terfenol-D magnetometer." R.Chung, MS, Iowa State University 1990.

3. "Development and applications of a new computer controlled magnetic inspection system." A.R.Eichmann, MS, Iowa State University 1992.
4. "Stress dependence of the magnetic properties of steels." M.K.Devine, MS, Iowa State University 1992.
5. "Micromagnetic surface studies of materials for nondestructive evaluation." L.B.Sipahi, MS, Iowa State University 1992.
6. "Magnetization and magnetostriction in highly magnetostrictive materials." J.B.Thoelke, MS, Iowa State University 1993.
7. "Magnetic property measurements for the evaluation of fatigue in steels." A.C.Strom, MS, Iowa State University 1994.
8. "Angular dependence of magnetic properties of steels under stress." D.A.Kaminski, MS, Iowa State University 1994.
9. "Measurement and modelling of structure sensitive magnetic properties of materials." Z.J.Chen, PhD, Iowa State University 1994. (Iowa State University Research Excellence Award Winner).
10. "The implementation and applications of a hysteresis model." Z.Gao, MS, Iowa State University 1995.
11. "Magnetoelastic properties of Terfenol-D under time dependent applied magnetic fields", P.P.Pulvirenti, MS, Iowa State University 1996.
12. "Effects of localized defects and anisotropy on the magnetization behavior of nickel", A.Ramesh, MS, Iowa State University 1996.
13. "Dynamic variations of the magnetic properties of steel due to cyclic loading", Y.Bi, MS, Iowa State University, 1997. (Iowa State University Research Excellence Award Winner).
14. "Measurement of magnetic phenomena for determination of critical component lifetime", M.Negley, MS, Iowa State University, 1998.
15. "Magnetostriction of eutectic and dendritic terbium-zinc", D.W.Delaney, MS, Iowa State University, 1998.
16. "Measurements and modeling of the effects of orthogonal bias field on properties of isotropic magnetic materials", Y.Bi, PhD, Iowa State University, 1998.
17. "Steel microstructure characterization by magnetic nondestructive evaluation", H.Cao, MS, Iowa State University, 1998.
18. "Measurement of magnetic property improvements resulting from materials processing of high permeability soft magnetic materials", R.Chen, MS, Iowa State University, 1999. (Iowa State University Research Excellence Award Winner).
19. "Design, fabrication and analysis of a portable Terfenol-D based magnetostrictive diode laser external cavity sensor with advanced signal processing capability", R.Chung, PhD, Iowa State University, 1999.
20. "Application of magnetic NDE techniques to the fatigue of ferrous alloys", F.Tang, MS, Iowa State University, 1999.
21. "Development of highly magnetostrictive composites for applications in magnetomechanical torque sensors", Y.H.Chen, PhD, Iowa State University, 1999.



22. "Non-linear irreversible magnetization processes in magnetic materials: instrumentation, measurements, modeling and applications", B.Zhu, PhD, Iowa State University, 2001. (Iowa State University Research Excellence Award Winner).
23. "Thermal expansion studies on the magnetic-crystallographic transformation of  $Gd_5(Si_xGe_{1-x})_4$ ", M.G.Han, MS, Iowa State University, 2002.
24. "Development of high sensitivity materials for applications in magnetomechanical torque sensors", Y.P.Shen, MS, Iowa State University, 2003.
25. "Correlation between domain behavior and magnetic properties of materials", J.S.Leib, MS, Iowa State University, 2003.
26. "Investigation of magnetomechanical behaviour of materials: instrumentation, measurement and modeling", L.Li, MS, Iowa State University, 2003.
27. "Development of modeling and simulation for magnetic particle inspection using finite elements", J.Y.Lee, MS, Iowa State University, 2003.
28. "A model for spin-dependent magnetic junction behavior", B.Baker, MS, Iowa State University, 2003
29. "Development of magnetic stress detection methods involving a cobalt ferrite composite stress sensing material and a magnetic imaging system", J.A.Paulsen, MS, Iowa State University, 2004.
30. "Critical behavior of thermal expansion and magnetostriction in the vicinity of the first order transition at the Curie point of  $Gd_5(Si_xGe_{1-x})_4$ ", M.Han, PhD, Iowa State University, 2004.
31. "Effects of stress on the magnetic properties of stainless steel and nickel", L.Li, PhD, Iowa State University, 2004.
32. "Examination of magnetic phase transition in  $Pr_{(n+2)(n+1)}Ni_{n(n-1)+2}Si_{n(n+1)}$  compounds using thermal expansion and magnetostriction", S.H. Song, MS, Iowa State University, 2005.
33. "Magnetic nondestructive characterization of case depth in surface-hardened steel", E.R.Kinser, MS, Iowa State University, 2005
34. "Investigation of magnetic and magnetoelastic properties of novel materials involving cobalt ferrite and terbium silicon germanium systems", A.P.Ring, MS, Iowa State University, 2006.
35. "Design and Development of Bilayer Sensor Systems for Biomedical and Automotive Applications", G.S. Katranas, PhD, Cardiff University, 2006.
36. "Magnetic and magnetoelastic properties of M-substituted cobalt ferrites (M = Mn, Cr, Ga, Ge)", S.H.Song, PhD, Iowa State University, 2007.
37. "Development of Barkhausen Noise Method for Residual Stress Evaluation in Steels", O. Alasamar, MSc, Cardiff University, 2009.
38. "Advanced Magnetoelastic and Magnetocaloric Materials for Device Applications", R.L.Hadimani, PhD, Cardiff University, 2009.

39. "Investigation and analysis of a magnetic torsion angle sensor", N.Sawant, MSc, Cardiff University, 2010.
40. "Investigation of chemically substituted cobalt ferrite for high magnetostriction based sensor and actuator applications", N. Ranvah, PhD, Cardiff University, 2010.

41. "Growth, Characterisation and Modelling of Novel Magnetic Thin Films for Engineering Applications", A.K.Raghunathan, PhD, Cardiff University, 2010.
42. "Development and Application of Magnetic Modelling to the Design of Power Devices", E.A.Umenei, PhD, Cardiff University, 2010.
43. "Treatment for traumatic brain injury in mice using transcranial magnetic stimulation", A. M. Carr, MS, Iowa State University, 2013.
44. "Magnetic hysteresis and Barkhausen noise emission analysis of magnetic materials and composites," N. Prabhu-Gaunkar, MS, Iowa State University, 2014.
45. "Analysis and development of transcranial magnetic stimulation devices", L.J.Crowther, PhD, Iowa State University, 2014. (Iowa State University Research Excellence Award Winner).
46. "Detection of sub-surface stresses in ferromagnetic materials using a new Barkhausen noise method", O. Kypris, PhD, Iowa State University, 2015. (Iowa State University Research Excellence Award Winner).
47. "Cellular level studies and coil system design for transcranial magnetic stimulation", Yiwen Meng, MS, Iowa State University, 2015.
48. "Evaluation of structural integrity of steel components by non-destructive magnetic methods", L.Mierczak, PhD, Cardiff University, 2015.

### **13. INTELLECTUAL PROPERTY: PATENTS & DISCLOSURES**

1. "Nondestructive evaluation of the T1 phase in Al-Li-Cu alloys", US Patent No. 4,947,117, (August 1990). Buck; Otto (Ames, IA), Bracci; David J. (Maryland Heights, MO), Jiles; David C. (Ames, IA), Brasche; Lisa J. H. (Nevada, IA), Shield; Jeffrey E. (Ames, IA), Chumbley; Leonard S. (Ames, IA)
2. "Nondestructive stress detection in ferromagnetic materials", US Patent No. 5,012,189, (April 1991). Jiles; David C. (Ames, IA)
3. "Multiparameter magnetic inspection system", US Patent No. 5,008,621, (April 1991). Jiles; David C. (Ames, IA)
4. "Laser diode terfenol magnetostrictive magnetometer", US Patent No. 5,039,943, (August 1991). Weber; Robert J. (Boone, IA), Chung; Wing C. (Ames, IA), Jiles; David C. (Ames, IA), Verhoeven; John D. (Ames, IA)
5. "System and method for nondestructive evaluation of surface characteristics of a magnetic material", US Patent No. 5,313,405, (May 1994). Jiles; David C. (Ames, IA), Sipahi; Levent B. (Ames, IA)
6. "A magnetic imaging system and method", US Patent No. 5,394,083, (February 1995). Jiles; David C. (Ames, IA)
7. "Magnetic inspection probe for measurement of anisotropy", US Patent No. 5,475,305, (December 1995). Jiles; David C. (Ames, IA), Devine; Michael K. (Ames, IA)
8. "A universal contoured magnetic inspection head for magnetic inspection", US Patent No. 5,479,099, (1995). Jiles; David C. (Ames, IA), Kaminski; David A. (Ames, IA)
9. "Apparatus and method for on line Barkhausen measurement", US Patent No. 6,084,404, (July 2000). Jiles; David C. (Ames, IA), Parakka; Anthony (Plano, TX)

10. "A material for magnetostrictive sensors and other applications based on ferrite materials", US Patent No. 6,093,337, (July 2000). McCallum; R. William (Ames, IA), Snyder; John E. (Ames, IA), Dennis; Kevin W. (Ames, IA), Schwichtenberg; Carl R. (Ames, IA), Jiles; David C. (Ames, IA)
11. "Magnetostrictive materials and method for improving frequency response in same", US Patent No 6,273,965, (August 2001). Pulvirenti; Patricia P. (Chicago, IL), Jiles; David C. (Ames, IA)
12. "A material for magnetostrictive sensors and other applications based on ferrite materials", US Patent No. 6,352,649, (March 2002). McCallum; R. William (Ames, IA), Snyder; John E. (Ames, IA), Dennis; Kevin W. (Ames, IA), Schwichtenberg; Carl R. (Ames, IA), Jiles; David C. (Ames, IA)
13. "Permanent magnet array for generation of magnetic fields", US Patent No. 6,680,663, (January 2004). Lee; Seong-Jae (Ames, IA), Jiles; David (Ames, IA), Gschneidner, Jr.; Karl A. (Ames, IA), Pecharsky; Vitalij (Ames, IA)
14. "Cobalt Ferrite Based Magnetostrictive Materials for Magnetic Stress Sensor and Actuator Applications", US Patent No. 7,326,360, (February 2008). Jiles; David C. (Ames, IA), Paulsen; Jason A. (St. Paul, MN), Snyder; John E. (Ames, IA), Lo; Chester C. H. (Ames, IA), Ring; Andrew P. (Ames, IA), Bormann; Keith A. (State Center, IA)
15. "Magneto-Optic Remote Sensor for Angular Rotation, Linear Displacements, and Evaluation of Surface Deformations", Lee; Seong-Jae (Ames, IA), Song; Sang-Hoon (Ames, IA), Melikhov; Yevgen (Penarth, GB), Park; Choon-Mahn (Seoul, KR), Hauser; Hans (Vienna, AT), Jiles; David (Glamorgan, GB) Patent No. 7,365,533 (April 2008)
16. "Method for improving frequency response of magnetostrictive materials", (Pending). ISURF 2051
17. "A high permeability low core loss, amorphous fiber composite magnetic material", (Pending). ISURF 2088
18. "Controllable magnetic inductor using virtual air gap technology", (Pending) ISURF 2525
19. "New manganese substituted cobalt ferrite materials for stress sensor and actuator applications" (Provisional application), ISURF 3066
20. "Method for altering the conductivity of materials", Jiles David C., Magnell Steffen and Mina, Mani. WO2011133597,
21. "Apparatus and method for altering the properties of fuel by processing through the application of a magnetic field", US Patent No. 9,006,938 (April 14, 2015) Jiles; David C. (Ames, IA), Magnell, Steffen (Plymouth, Minnesota) and Mani Mina (Ames, IA).

#### 14. CONSULTANCY

*Consultant for the following organisations :*

Analogy Inc., Oregon (1988)  
 MicroSim Corporation, California (1988-1992)  
 Thomatronik, Germany (1988-1992)  
 Pepperl and Fuchs, GmbH, Germany (1988)  
 Vector Fields, UK (1989)  
 Gas Research Institute, Illinois (1989)  
 Avca Corporation, Ohio, (1991)  
 Flow Research Evaluation & Diagnostics, UK (1991)  
 MoD, Admiralty Research Establishment UK (1990-92)  
 Luxtron Corporation, California (1991-92)

Binney & Smith Inc., Pennsylvania (1992)  
Kawasaki Steel Corporation, Japan (1992)  
Anacad, Germany (1992)  
CISE, Italy (1990-1992)  
Italian Society for nondestructive testing, monitoring and diagnostics (1991-92)  
Sensormatic Electronics Corporation, Florida (1994)  
SSI/Technical Advances Inc., Iowa (1994-5)  
US Nuclear Regulatory Commission (1996)  
Southwest Research Institute/Electric Power Research Institute (1997)  
Lord Corporation, (1998)  
Brinks, Hofer, Gilson and Lione, LLP (1999-2001)  
Holcomb Healthcare (1999-2001)  
North Atlantic Treaty Organization "NATO" (2000)  
Howrey, Simon, Arnold and White, LLP (2000-06)  
Caterpillar Inc. (2000-2006)  
Burgess-Norton (2002)  
Lord Corporation (2002)  
Hovey Williams, LLP (2002-04)  
Thermal Solutions Inc. (2001-2004)  
Baker, Donelson, Bearman, Caldwell & Berkowitz, LLP (2004)  
Alticor (2004)  
Authentix (2009)  
Dynapulse (2009-11)  
Novak, Druce & Quigg, LLP (2012)  
Intellectual Ventures (2012)  
Sidley Austin LLP (2014)  
Rubin Anders Scientific (2014)  
Sensormatic and Tyco (2014)  
US Department of Justice v. Demodulation Inc. (2015)

## **15. OTHER RELATED PROFESSIONAL ACTIVITIES**

President, Magnetics Technology Inc. (1988-present)  
Director, Magnetica Inc. (1992-97)  
Chairman, Magnetics Technology UK Ltd (2004-2013)

### *Expert witness testimony*

I have acted as an expert advisor and witness for the following cases:

State of Iowa v. Quattro Corporation  
Amway v. Nikken  
Caterpillar v. Sturman Industries  
Thermal Solutions Inc. v. Vesture

These included preparation of expert reports, videotaped deposition testimony and court appearances.

### *Recent contract research and development projects conducted through Magnetics Technology Inc. :*

"Computer modelling of ferromagnetic hysteresis for electrical circuit simulation"  
"Frequency dependence of the hysteresis curves of materials for inductor cores"  
"Assessment of the design of a novel magnetic process for copper plating of steel"  
"Design and performance considerations for magnetostrictive current sensors"  
"Modelling of the effects of cyclic stress on the magnetization of steels under constant applied magnetic field"  
"Design consideration for a magnetically operated erasable drawing pad"

"Magnetic hysteresis in Fe-Si alloy plates"  
 "Review of NDE methods for evaluation of pressure vessel material properties"  
 "Magnetic materials for magnetorheological applications"  
 "Evaluation of magnet arrays for magnetic therapy"  
 "Evaluations of magnetically operated fuel injectors"  
 "Development of variable reluctance magnetic sensors for torsional stress determination in rotating components of aircraft engines"  
 "In situ magnetic method for materials property evaluation: possible technology for practical implementation"  
 "Evaluation of inductively heated magnetic pads for maintenance of temperature of heated products"

## **16. PROFESSIONAL SOCIETY MEMBERSHIP NUMBERS**

Fellow of the Institute of Materials, Minerals and Mining UK (IOM3 449959)  
 Fellow of the American Physical Society (APS# MJ1182368).  
 Fellow of the Institute of Physics (IOP# 042146E).  
 Fellow of the Institute of Electrical & Electronic Engineers (IEEE# 04949145).  
 Fellow of the Magnetics Society of IEEE  
 Fellow of the Institution of Electrical Engineers (IEE# 22355784).  
 Fellow of the Institute of Mathematics and its Applications (IMA# 7848).  
 Member of the European Physical Society (EPS# 948005).  
 Member of the American Society for Materials (ASM# 051493).  
 Member of the Metallurgical Society (TMS# 039384).  
 Member of the American Society for Nondestructive Testing (ASNT# 44324)  
 Member of the Materials Research Society (MRS# 0076138).  
 Member of the American Society for Engineering Education (ASEE# 44588)  
 Chartered Engineer, UK, CEng. Number 399553  
 Professional Engineer, Iowa, PE. Number 11592

## **17. RESEARCH CONTRACT REPORTS**

1. "Development of NDE measurement techniques of interest to the railroad industry", D.C.Jiles and M.K.Devine. Association of American Railroads, March 1991.
2. "Magnescope : a portable magnetic inspection system", D.C.Jiles. US Department of Commerce, July 1991.
3. "A Terfenol laser diode magnetometer", R.Weber and D.C.Jiles. US Department of Commerce, March 1992.
4. "Micromagnetic surface studies of materials for NDE", D.C.Jiles, National Science Foundation, Final Report, Grant Number MSS-8915428, September 1992.
5. "Mechanical deformation effects on magnetic properties: Part I, Effects of stress", M.J.Sablik and D.C.Jiles, Electric Power Research Institute, November 1992.
6. "Magnetostriction in Tb-Dy-Fe alloys: measurement and modelling of properties", D.C.Jiles and R.D.Greenough, North Atlantic Treaty Organization, March 1993.
7. "Magnetic inspection of creep damaged components in power generating systems", D.C.Jiles, M.R.Govindaraju and

S.B.Biner. Ontario Hydro, April 1993.

8. "Magnetic properties measurements of irradiated, aged and prestrained materials", L.B.Sipahi, M.R.Govindaraju and D.C.Jiles. Westinghouse Electric Corporation, May 1993.

9. "Quantitative NDE for steel components of large structural systems", D.C.Jiles, S.B.Biner and M.R.Govindaraju. National Science Foundation, Final Report, Grant Number MSS-9018532, August 1993.

10. "Detection of fatigue damage in aircraft landing gears", D.C.Jiles. McDonnell Douglas Aircraft Corporation, September 1993.

11. "Improving the energy efficiency characteristics of magnetic metallic glasses through materials processing and optimization of magnetic field waveform", D.C.Jiles, P.Molian, A.P.Parakka and M.R.Govindaraju. State of Iowa, October 1993.

12. "Application of a new magnetic monitoring technique to in situ evaluation of fatigue damage in ferrous components of nuclear primary systems", D.C.Jiles, S.B.Biner M.Govindaraju and Z.J.Chen. Nuclear Regulatory Commission, Final Report, Grant Number NRC-04-91-098, May 1994.

13. "Magneprobe: a micromagnetic inspection system for inspection of surfaces", D.C.Jiles. US Department of Commerce, July 1994.

14. "Mechanical deformation effects on magnetic properties: Part II, Effects of creep damage", M.J.Sablik and D.C.Jiles. Electric Power Research Institute, July 1994.

15. "Laser magnetic domain refinement of transformer cores", P.Molian and D.C.Jiles, Electric Power Research Center, July 1994.

16. "Magnetic nondestructive evaluation for railroad wheel inspection programs", Association of American Railroads, November 1994.

17. "Micromagnetic methods for evaluation of residual stress in crankshaft fillets", D.C.Jiles and D.A.Kaminski, Cummins Engine Company, February 1995.

18. "An investigation of the effects of creep on the structure and magnetic properties of nickel through simulated cavitation in a model material", D.C.Jiles, S.B.Biner and M.R.Govindaraju, National Science Foundation, Grant Number DMR-9310273, February 1995.

19. "Effects of laser surface scribing on the core losses in silicon iron laminations", M.R.Govindaraju, A.P.Parakka and D.C.Jiles, US Department of Energy, CRADA with ABB Inc., May 1995.

20. "Mechanical deformation effects on magnetic properties: Part III, Magnetic detection of creep damage at seam welds", M.J.Sablik and D.C.Jiles, Electric Power Research Institute, October 1995.

21. "Development of new magnetostrictive material for sensors and actuators", D.C.Jiles and R.W.McCallum, US Department of Energy, CRADA Number AL-95-08, with General Motors Corporation, December 1995.

22. "Magnetostriction in Tb-Dy-Fe alloys: measurement and modelling of properties", D.C.Jiles and R.D.Greenough, Final report, NATO Grant Number CRG-910275, March 1996.

23. "New amorphous magnetic fibers for highly efficient soft magnetic cores", Final Report, US Department of Energy, Laboratory Directed Research and Development Project, December 1996.

24. "Ferrite substrates for miniaturization of power electronics", Contract Report for Rockwell-Collins, December 1996.
25. "Improved manufacturing processes for the production of new high efficiency materials for transformer cores", M.Govindaraju, P.Molian and D.C.Jiles. Contract Report for ABB, December 1996.
26. "Assessment of Barkhausen effect measurements for evaluation of ground steel components", D.C.Jiles and A.P.Parakka and H.Gupta. Final report, National Science Foundation Grant Number EEC-94-18363, December 1996.
27. "Development of the Magnescope as an instrument for in-situ evaluation of steel components of nuclear systems", D.C.Jiles, Y.Bi and S.B.Biner. Final report, US Nuclear Regulatory Commission, Grant Number NRC-04-94-092, February 1997.
28. "An investigation of the effects of creep on the structure sensitive magnetic properties of nickel", D.C.Jiles. Final report, National Science Foundation, Grant Number DMR-9310273, December 1997.
29. "Microstructural study of NdFeB permanent magnet materials doped with Dy", D.C.Jiles and C.C.Lo, US Department of Energy, Center for Excellence in Synthesis and Processing, July 1998.
30. "Physical interpretation and comparison of hysteresis in magnetic materials", D.C.Jiles and M.Pasquale, Final report, NATO, Grant number CRG 960765, August 1998.
31. "Improved manufacturing processes for the production of new high efficiency materials for transformer and motor cores", Final report, National Science Foundation, Grant Number DMII-9622649, November 1998.
32. "Measurements and modeling of the effects of an orthogonal bias field on properties of isotropic magnetic materials", Y.Bi, D.C.Jiles and S.J.Lee, Final Report, Avionics and Communications Division, Rockwell Collins Inc., January 1999.
33. "Characterization of the magnetic and structural properties of recording head materials", D.C.Jiles, M.J.Kramer, C.C.H.Lo and J.E.Snyder, Seagate Technology Inc., Minneapolis, March 1999.
34. "Nondestructive enhancement of material lifetimes by stress reduction in ferrous metals without associated microstructural changes", State of Iowa/IPRT, June 1999.
35. "Composite magnetostrictive materials for advanced automotive magnetomechanical sensors", US DOE, Office of Computational and Technology Research, December 1999.
36. "Examination of the relationship between magnetic hysteresis and the mechanical properties of steels", Final Report, National Science Foundation, Grant Number CMS-9532056, February 2001.
37. "Magnetic finite element course modules and demonstrations", Final Report, Ansoft University Program, March 2001.
38. "Modeling of magnetization processes in magnetic materials for evaluation of microstructure", Final Report, National Science Foundation, Grant Number INT-9732135, April 2001.
39. "Development of high efficiency rotary magnetocaloric refrigerator prototype: permanent magnet array for magnetic field generation", US Department of Energy, May 2002.
40. "Simulation of permanent magnets for applications in orthopaedic surgery", National Institutes of Health and Mayo Clinic, May 2002.



41. "Magnetic processing for enhancement of lifetimes of ferrous metals subjected to repeated stress", National Science Foundation, Grant Number CMS-9910147, October 2002.
42. "New sandwich layers for magnetic tunnel junctions with controllable band gaps", National Science Foundation", Grant Number ECS-0100799, January 2003.
43. "Laboratory for magnetic thin film and magnetoelectronic device research", Roy J. Carver Charitable Trust, February 2003.
44. "The piezomagnetic Matteucci effect in nickel alloys: development of theory and applications", National Science Foundation, Grant Number DMR-9902415, December 2003.
45. Vertically integrated Design for Combined Research and Curriculum Development: A blueprint for Education in Engineering Design", National Science Foundation, Grant Number, Grant Number EEC-9980331, March 2005.
46. "Magnetic measurement equipment for materials property characterization in the Magnetoelectronic and Spintronics Laboratory", Roy J. Carver Charitable Trust, April 2005.
47. Magnetic Particle Inspection Improvements for Aerospace Applications", US Federal Aviation Authority, April 2005.
48. "FRG: New Magnetoelastic Materials with High Stress Sensitivity and Low Hysteresis", National Science Foundation, Grant Number DMR-0402716, June 2006.
49. "Characterization and modelling of magnetic materials for fault current limiters", D.C.Jiles, E. Umenei, Zenergy Power Systems, 2009.
50. Development of Barkhausen Noise Method for residual stress evaluation on helicopter components", Final Report, D.C. Jiles and L. Mierczak, Augusta Westland, October 2009.
51. "Development of Magnetic Stimulation Devices for Medical Applications, DC Jiles. PI Williams, P Marketos and L. Crowther, MagStim Company Ltd. and the Welsh Assembly Government, January 2011.
52. "Development of Energy Efficient Magnetic Cooling for Healthcare Applications in Refrigeration of Pharmaceuticals", D.C.Jiles and A.Prahakar, Royal Academy of Engineering, March 2011.
53. "Investigation of new magnetoelastic-caloric materials for device applications", The Royal Society, 2011.

## **18. INVITED SEMINARS AND COLLOQUIA**

1. "Third order elastic constants of erbium", Physics Department, Victoria University, Wellington, New Zealand, August, 1980.
2. "Magnetoelastic properties of terbium", Physics Department, Victoria University, Wellington, New Zealand, September, 1980.
3. "Piezo optic properties of Au-V and Au-Co alloys", Physics Department, Queen's University, Kingston, Canada, December, 1981.
4. "Theory of ferromagnetic hysteresis and the effects of stress on magnetic properties", Physics Department,

Queen's University, Kingston, Canada, September, 1982.

5. "Investigation of the effects of mechanical stress on the magnetic properties of pipeline steels for pipeline stress monitoring", Energy and Mineral Resources Research Institute, National Research Council of Canada, Montreal, August 1983.
6. "Theory of ferromagnetic hysteresis and the effects of stress on the magnetic properties of steels", Ames Laboratory, Iowa State University, February 1984.
7. "Microstructural dependence of the magnetic properties of the Fe-C alloy system", Energy and Mineral Resources Research Institute, National Research Council of Canada, Montreal, December 1984.
8. "Microstructural dependence of the magnetic properties of the Fe-C alloy system", Physics Department, Queen's University, Kingston, Canada, January 1985.
9. "Microstructural dependence of the magnetic properties of the Fe-C alloy system", Physics Department, University of Minnesota, Duluth, February 1985.
10. "Theory of ferromagnetic hysteresis", Department of Geophysics, University of Edinburgh, Scotland, May 1985.
11. "Magnetic methods for non destructive evaluation", Department of Applied Physics, University of Hull, June 1986.
12. "An automated control and data logging system for the determination of magnetic properties of materials for nondestructive evaluation", Department of Geophysics, University of Edinburgh, Scotland, June 1986.
13. "An Automated control and data logging system for the determination of magnetic properties of materials for nondestructive evaluation", Department of Geology and Physical Sciences, Oxford Polytechnic, Oxford, U.K., July 1986
14. "Microstructural dependence of the magnetic properties of 4130 alloy steels for NDE", Battelle Memorial Institute, Columbus, Ohio, September 1986.
15. "Evaluation of the mechanical and metallurgical condition of steel from magnetization measurements", Westinghouse Electric Corporation, Research & Development Center, Pittsburgh, Pennsylvania, U.S.A., April 1987.
16. "Physical systems exhibiting hysteresis", Physics Department, University of Southampton, December 1987.
17. "Integrated on line instrumentation for automated measurement of magnetic field, induction, magnetostriction, magnetic Barkhausen effect and magnetoacoustic emission", Department of Applied Physics, University of Hull, December 1987.
18. "Magnetic methods for non destructive evaluation", British Gas, On Line Inspection Centre, Cramlington, Northumberland, December 1987
19. "Physical systems exhibiting hysteresis", Physics Department, University of Warwick, December 1987.
20. "Physical systems exhibiting hysteresis", Analogy Inc., Portland, Oregon, February, 1988
21. "Magnetomechanical properties of some iron and nickel based alloys", Physics Department, University of

Warwick, July 1988.

22. "Determination of stress in ferromagnetic steels from differential magnetic susceptibility measurements", Harwell Laboratory, U.K. Atomic Energy Authority, July 1988.
23. "Magnetomechanical properties of some iron and nickel based alloys", Department of Applied Physics, University of Hull, July 1988.
24. "Determination of stress in ferromagnetic steels from differential magnetic susceptibility measurements", Lancashire Polytechnic, Preston, July 1988.
25. "Determination of stress in ferromagnetic steels from differential magnetic susceptibility measurements", General Electric Company, Engineering Research Laboratory, Stafford, July 1988.
26. "Determination of stress in ferromagnetic steels from differential magnetic susceptibility measurements", Fraunhofer Institute for Non Destructive Testing, University of the Saarland, Germany, July 1988.
27. "Determination of stress in ferromagnetic steels from differential magnetic susceptibility measurements", French Iron and Steel Research Institute, St. Germain-en-laye, Paris, France, July 1988.
28. "Applications of magnetism to NDE", Physics Department, Queen's University, Kingston, Canada, January 5th, 1989.
29. "Theory of ferromagnetic hysteresis: the influence of defects on magnetic domain wall motion", Physics Department, Iowa State University, January 25th, 1989.
30. "Applications of magnetism to NDE", Southwest Research Institute, San Antonio, Texas, April 21st, 1989.
31. "Magnetomechanical effects in ferromagnetic materials", Centre National de Recherche des Sciences, (CNRS), Laboratoire de Magnetisme, Meudon-Bellevue, France, May 26th, 1989.
32. "Theory of ferromagnetic hysteresis and its applications to modelling of bulk magnetic properties of magnetic materials", Pepperl and Fuchs, Mannheim, West Germany, May 29th, 1989.
33. "Magnetomechanical effects in ferromagnetic materials", Physics Department, University of Salford, Salford, United Kingdom, May 30th, 1989.
34. "Theory of ferromagnetic hysteresis and its applications to modelling of bulk magnetic properties of magnetic materials", Vector Fields Ltd, Kidlington, Oxford, United Kingdom, June 2nd, 1989.
35. "Evaluation of microstructure and mechanical properties of steels from magnetic property measurements", CISE Spa., Segrate, Milan, Italy, December 18th, 1990.
36. "Theory of hysteresis: comparison of theory and experiment", CISE Spa., Segrate, Milan, Italy, December 19th, 1990.
37. "Theoretical modelling of the magnetization process in ferromagnetic materials", Istituto Elettrotecnico Nazionale Galileo Ferraris, Turin, Italy, December 20th, 1990.
38. "Magnetic NDE: applications to plant life extension", Westinghouse Science & Technology Center, Pittsburgh, Pennsylvania, January 25th, 1991.

39. "Detection of incipient failure of steels from magnetic property measurements", Ontario Hydro, Kipling Research Centre, Toronto, Canada, 26th March 1991.
40. "Application of magnetism to NDE", Electric Power Research Institute, Palo Alto, California, 18th April 1991.
41. "Real time modelling of the magnetic properties of materials on small computers", Seminar on Non-linear hysteresis modelling, Rosenheim, Germany, 12th June 1991.
42. "Critical changes in magnetic properties of steels resulting from incipient failure mechanisms", Fraunhofer Institute, University of the Saarland, Saarbrücken, Germany, 13th June, 1991.
43. "Hysteresis and magnetostriction in Terfenol and other ferromagnetic materials", Department of Metallurgy and Materials Science, University of Birmingham, United Kingdom, June 15th 1991.
44. "Research, the funding cycle and other mysteries", Magnetics Seminar Series, Iowa State University, 9<sup>th</sup> February 1992.
45. "Nondestructive evaluation at Iowa State University", CISE Spa., Milan, Italy, 21st May, 1992.
46. "Magnetic property measurements for assessment of material condition", CISE Spa., Milan, Italy, 22nd May, 1992.
47. "Hysteresis modelling in ferromagnetic materials: effects of temperature, frequency and stress", Seminar on Non-linear hysteresis modelling, Rosenheim, Germany, 25th May 1992.
48. "Generalized self consistent modelling of minor loops in the theory of hysteresis", CNRS Laboratoire de Magnétisme et Matériaux Magnétique, Bellevue, France, 26th June 1992.
49. "Development of new magnetic inspection instrumentation for evaluation of microstructure and mechanical condition of steels", IRSID, St.Germain en Laye, France, 29th June 1992
50. "Magnetic property modelling and its applications to assessment of material condition", Istituto Elettrotecnico Nazionale, Torino, Italy, 3rd July, 1992.
51. "The development of new magnetic inspection instrumentation and its applications to nondestructive evaluation", Fraunhofer Institute, University of the Saarland, Germany, 6th July 1992.
52. "Detection of stress and related problems in steels from magnetic property measurements", Department of Physics and Applied Mathematics, Technical University of Gdansk, Poland, 10th July, 1992.
53. "Magnetic methods for nondestructive testing", Department of Mechanical Engineering, Universität des Saarlandes, Germany, July 15th, 1992.
54. "The laser diode magnetometer", Electric Power Research Center, Iowa Test and Evaluation Facility Annual Meeting, March 23rd, 1993.
55. "Modelling of hysteresis in magnetic materials", National Institutes of Standards & Technology, Gaithersburg, Maryland, October 15th, 1993.
56. "Theoretical modelling of the effects of anisotropy and stress on the magnetization and magnetostriction of terbium-dysprosium-iron", General Motors Corporation, Research and Development Center, Warren, Michigan, November 4th, 1993.

57. "Recent advances in modelling the effects of time dependent stress and magnetic field on hysteresis", Thomatronik Inc., Rosenheim, Germany, 10th December, 1993.
58. "Appropriate scale theories for modelling magnetic properties of materials", Department of Applied Physics, University of Hull, United Kingdom, December 15th, 1993.
59. "Theoretical modelling of the effects of anisotropy and stress on the magnetization and magnetostriction of terbium-dysprosium-iron", Physics Department, Queen's University, Canada, January 4th, 1994.
60. "Modelling of magnetic properties of materials: the interface between physical understanding and technological application", Southwest Research Institute, San Antonio, Texas, July 14th, 1994.
61. "Unravelling the mysteries of hysteresis: effects of time dependent stress and magnetic field on magnetization", Department of Applied Physics, University of Hull, United Kingdom, August 17th, 1994.
62. "Measurement and modelling of the structure sensitive magnetic properties of materials", Idaho National Engineering Laboratory, November 17th, 1994.
63. "Measurement and modelling of the structure sensitive magnetic properties of materials", Department of Materials Science and Mineral Engineering, University of California, Berkeley, November 29th, 1994.
64. "Theory and modelling of the effects of applied stress and frequency of magnetic field on magnetization in magnetic materials", Brookhaven National Laboratory, December 6th, 1994.
65. "Modeling the magnetic properties of materials", Dept. Materials Science and Engineering, Johns Hopkins University, February 8, 1995.
66. "Properties and applications of magnetic materials", Physics Department, University of Pertanian, Selangor, Malaysia, April 11, 1995.
67. "Theoretical modelling of hysteresis in ferromagnets", Physics Department, University of Pertanian, Selangor, Malaysia, April 12, 1995.
68. "Modelling of hysteresis in magnetic materials", School of Physics and Astronomy, University of Minnesota, Minneapolis, May 26, 1995.
69. "Modeling the magnetic properties of materials", Oak Ridge National Laboratory, Oak Ridge, Tennessee, December 15, 1995.
70. "Magnetic materials for sensors", Department of Materials Science and Engineering, Ohio State University, Columbus, Ohio, October 10, 1996.
71. "Anisotropic three dimensional model for hysteresis in materials", Department of Applied Physics, University of Hull, UK, December 16, 1996.
72. "Anisotropic three dimensional model for hysteresis in materials", Department of Physics, University of Surrey, UK, December 16, 1996.
73. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Queen's University, Kingston, Canada, March 26, 1997.

74. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Illinois Institute of Technology, Chicago, April 15, 1997.
75. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, National Institutes of Standards and Technology, Boulder, Colorado, May 21, 1997.
76. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, University College of Wales, Cardiff, UK, June 3, 1997.
77. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Department of Physics, University of Hull, UK, June 5, 1997.
78. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Technical University of Vienna, Austria, June 20, 1997.
79. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, University of the Saarland, Saarbrücken, Germany, Department of Materials Science, June 24, 1997.
80. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Max Planck Institute, University of Stuttgart, Stuttgart, Germany, June 27, 1997.
81. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Istituto Elettrotecnico Nazionale, Galileo Ferraris, Turin, Italy, July 4, 1997.
82. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Electricité de France, Paris, France, July 7, 1997.
83. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Magnetics Society UK Chapter Meeting, University of Bangor, Wales, July 11, 1997.
84. "Effects of stress and creep cavitation on the magnetic properties of steels", Fraunhofer Institute for Non destructive Testing, University of the Saarland, Saarbrücken, Germany, July 15, 1997.
85. "Magnetic methods for materials evaluation", Physics Department, University of Western Australia, Perth, Australia, August 4, 1997.
86. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Physics Department, University of Western Australia, Perth, Australia, August 6, 1997.
87. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Santa Clara Valley Chapter of the IEEE, September 16, 1997.
88. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Twin Cities Chapter of the IEEE, September 25, 1997.
89. "Magnetic methods for materials evaluation", EPRI Nondestructive Evaluation Center, Charlotte, North Carolina, November 4, 1997.
90. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Mid Texas Chapter of the IEEE, November 11, 1997.
91. "Modeling the magnetic properties of materials", Magnetics Society Distinguished Lecture, Boston Chapter of

the IEEE, November 19, 1997.

92. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Seagate Technology Inc., Minneapolis, January 21, 1998.
93. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Physics Department, Colorado State University, Fort Collins, Colorado, January 26, 1998.
94. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Department of Electrical Engineering and Computer Science, George Washington University, Washington DC., March 2, 1998.
95. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Department of Physics, Purdue University, April 2, 1998.
96. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Quantum Corporation, Shrewsbury, Massachusetts, April 14, 1998.
97. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Central New England Chapter of IEEE, Worcester, Massachusetts, April 15, 1998.
98. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Instituto de Magnetismo Aplicado, Las Rosas, Madrid, June 15, 1998.
99. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Politecnico di Milano, Italy, June 16, 1998.
100. "Different aspects of magnetic materials modeling", Istituto Elettrotecnico Nazionale, Galileo Ferraris, Turin, Italy, June 17, 1998.
101. "Short course on magnetism and magnetic materials", Lord Corporation, Cary, North Carolina, August 4 & 5<sup>th</sup>, 1998.
102. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Physics Department, Iowa State University, September 1, 1998.
103. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Carnegie Mellon University, October 9, 1998.
104. "Modeling the magnetic properties of materials", Magnetism Society Distinguished Lecture, Department of Electrical Engineering, Iowa State University, October 22, 1998.
105. "Applications of magnetic hysteresis and magnetomechanical effects in materials", Institute of Physics, Czech Academy of Sciences, Na Slovance, Prague, Czech Republic, June 29, 1999.
106. "Applications of magnetic hysteresis and magnetomechanical effects in materials", Istituto Elettrotecnico Nazionale, Turin, Italy, July 5, 1999.
107. "Applications of magnetic hysteresis and magnetomechanical effects in materials", Technical University of Vienna, July 8, 1999.
108. "Applications of magnetic hysteresis and magnetomechanical effects in materials", Department of Magnetism,

- Czech Academy of Sciences, Cukravarnicka, Prague, Czezech Republic, July 9, 1999.
109. "Modeling magnetic properties of materials", Laboratoire d'Electrotechnique, University of Grenoble, France, July 12, 1999.
  110. "Magnetomechanical effect in metal-bonded cobalt ferrite composites under torsional strain for torque sensors", Physics Department, University of Hull, December 20, 1999.
  111. "Magnetic hysteresis modeling". A short course presented at the Technical University of Vienna, June-July 2000.
  112. "Recent advances in magnetoelastic materials for Matteucci (inverse Wiedemann) effect sensors", Institute of Physics, Czech Academy of Sciences, Na Slovance, Prague, Czech Republic, June 19, 2000.
  113. "Modeling the magnetic properties of materials", Center for Advanced European Studies and Research, Research Institute, Bonn, Germany, June 26, 2000.
  114. "Modeling the magnetic properties of materials", Forschungszentrum Julich, June 27, 2000.
  115. "Theory and modeling of the Matteucci (inverse Wiedemann) effect in nickel and cobalt ferrite", Istituto Elettrotecnico Nazionale, Turin, Italy, July 3, 2000.
  116. "The Matteucci (inverse Wiedemann) effect and its applications to magnetomechanical torque sensors", Institute of Physics, Slovak Academy of Sciences, Bratislava, July 6, 2000.
  117. "New magnetostrictive composite material for magnetoelastic torque sensors applications", Center for Micromagnetics and Information Technology, University of Minnesota, November 3, 2000.
  118. "The application of magnetic measurements to the nondestructive evaluation of materials", Michigan State University, October 3, 2002.
  119. "Development of new magnetic imaging equipment for nondestructive evaluation of materials", Tata Steel Company, Jamshedpur, October 24, 2002
  120. "The effects of stress on magnetic properties and the use of magnetic measurements for evaluation of materials" Conference on Resurgence of Metallic Materials, Institute of Engineers of India, Jamshedpur, October 25, 2002.
  121. "Development of new magnetic imaging equipment for nondestructive evaluation of materials", National Metallurgical Laboratory, Jamshedpur, October 28, 2002
  122. "Extraordinary magnetomechanical coupling as a result of a combined magnetic structural transition in a new class of rare earth compound", Indian Institute of Technology, Kharagpur, October 30, 2002
  123. "The effects of stress on magnetic properties and the use of magnetic measurements for evaluation of materials", Indian Association for the Cultivation of Science, Calcutta, October 31, 2002
  124. "Development of new magnetic imaging equipment for nondestructive evaluation of materials", Variable Energy Cyclotron Centre, Department of Atomic Energy of India, Calcutta, November 1, 2002
  125. "Development of new magnetic imaging equipment for nondestructive evaluation of materials", Bengal Engineering College, Howrah, November 2, 2002.



126. “Extraordinary magnetic and magnetocaloric properties in a new class of rare earth compound”, Department of Materials Science and Engineering, University of Sheffield, United Kingdom, November 26, 2002.
127. “Extraordinary magnetomechanical coupling as a result of a combined magnetic/structural transition in a new class of rare earth compound”, Physics Department, University of York, United Kingdom, November 27, 2002.
128. “The effects of stress on magnetic properties of materials and the use of magnetic measurements for evaluation of materials” Wolfson Centre for Magnetism Technology, University of Cardiff, United Kingdom, November 28, 2002.
129. “Extraordinary magnetomechanical coupling as a result of a combined magnetic/structural transition in a new class of rare earth compound”, Annual Conference of the Korean Magnetism Society, Yong Pyeong, Korea, December 11, 2002.
130. “Recent developments in rare earth based magnetostrictive materials and their applications”, D.C.Jiles, C.C.H.Lo, K.A.Gschneidner Jr. and V.K.Pecharsky, Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic, June 10, 2003.
131. “Recent developments in rare earth based magnetostrictive materials and their applications” D.C.Jiles, C.C.H.Lo, K.A.Gschneidner Jr. and V.K.Pecharsky, Istituto Elettrotecnico Nazionale ‘Galileo Ferraris’, Torino, Italy, June 18, 2003.
132. “Recent developments in rare earth based magnetostrictive materials and their applications” D.C.Jiles, C.C.H.Lo, K.A.Gschneidner Jr. and V.K.Pecharsky, Physics Department, Vienna University of Technology, Vienna, Austria, June 27, 2003.
133. “Magnetic Materials: Applications in Sensors and Actuators”, D.C. Jiles, Department of Communication and Electronic Engineering, University of Plymouth, July 3, 2003.
134. “Recent advances and future directions in magnetic materials”, Osborn Research Club, Iowa State University, October 13, 2003.
135. “Recent developments in rare earth based magnetostrictive materials and their applications” D.C.Jiles, C.C.H.Lo, K.A.Gschneidner Jr. and V.K.Pecharsky, Wolfson Center for Magnetism Technology, University of Cardiff, UK, February 3, 2004.
136. “New manganese-doped cobalt ferrite material for applications in magnetoelastic sensors and actuators”, D.C.Jiles, Department of Engineering Materials, University of Sheffield, March 24, 2004.
137. “New manganese-doped cobalt ferrite material for applications in magnetoelastic sensors and actuators”, D.C.Jiles, Department of Pure and Applied Physics, University of Salford, March 31, 2004.
138. “A new class of rare earth magnetic compounds based on  $Gd_5(S_xGe_{1-x})_4$  with extraordinary magnetostriction, magnetocaloric effect and magnetoresistive properties”, D.C.Jiles, J.E.Snyder, C.C.H.Lo, K.A.Gschneidner Jr. and V.K.Pecharsky. University of Glasgow, May 14, 2004.
139. “A new class of rare earth magnetic compounds based on  $Gd_5(S_xGe_{1-x})_4$  with extraordinary magnetostriction, magnetocaloric effect and magnetoresistive properties”, D.C.Jiles, J.E.Snyder, C.C.H.Lo, K.A.Gschneidner Jr. and V.K.Pecharsky. University of Durham, June 16, 2004.
140. “A new class of rare earth magnetic compounds based on  $Gd_5(S_xGe_{1-x})_4$  with extraordinary magnetostriction, magnetocaloric effect and magnetoresistive properties”, D.C.Jiles, J.E.Snyder, C.C.H.Lo, K.A.Gschneidner Jr.

and V.K.Pecharsky. University of Exeter, June 25, 2004.

141. “Magnetic Methods for Nondestructive Evaluation of Surface Condition”, D.C. Jiles, C.C.H. Lo, L. Li, E.R. Kinser, A. Barsic, National Metallurgical Laboratory, Jamshedpur, India, March 16, 2005.
142. “New Mn and Cr substituted cobalt ferrite materials for magnetoelastic stress sensor applications”, D.C. Jiles, A.P. Ring, C.C. H. Lo and J.E. Snyder, E.Melikhov, National Metallurgical Laboratory, Jamshedpur, India, March 16, 2005.
143. “Magnetic Methods for Nondestructive Evaluation of Surface Condition”, D.C. Jiles, C.C.H. Lo, L. Li, E.R. Kinser, A. Barsic, Bengal Engineering and Science University, Howrah, India, March 17, 2005.
144. “New Mn and Cr substituted cobalt ferrite materials for magnetoelastic stress sensor applications”, D.C. Jiles, A.P. Ring, C.C. H. Lo and J.E. Snyder, Y. Melikhov, Central Glass and Ceramics Research Institute, Kolkata, India, March 17, 2005.
145. “A new class of rare earth magnetic compounds based on  $Gd_5(Si_xGe_{1-x})_4$  with extraordinary magnetostriction, magnetocaloric and magnetoresistive properties” D.C.Jiles, J.E.Snyder, C.C.H.Lo, K.A.Gschneidner Jr. and V.K.Pecharsky. Center for Materials Research and Analysis, University of Nebraska Lincoln, May 10, 2005.
146. “A new class of rare earth magnetic compounds based on  $Gd_5(Si_xGe_{1-x})_4$  with extraordinary magnetostriction, magnetocaloric and magnetoresistive properties” D.C.Jiles, J.E.Snyder, C.C.H.Lo, K.A.Gschneidner Jr. and V.K.Pecharsky. Magnetic Microscopy Center, Physics Department, University of Minnesota, June 29, 2005.
147. “Non linear behavior in magnetic materials (Invited)”, Ewing Lecture, Annual Lecture of the UK Magnetics Society, Royal Society, London, December 6, 2005.
148. “Non linear behavior in magnetic materials”, Physics Department, Cardiff University, December 14, 2005.
149. “Magnetic methods for materials characterization”, Tata Steel Company, Jamshedpur, India, January 12, 2006.
150. “Non-linear Behaviour in Magnetic Materials”, Indian Institute of Technology, Kharagpur, January 13, 2006.
151. “Magnetic methods for materials characterization”, Centre for Nondestructive Evaluation, Indian Institute of Technology, Madras, January 14, 2006.
152. “Non-linear Behaviour in Magnetic Materials”, Department of Materials Science, Indian Institute of Technology, Madras, January 15, 2006.
153. “Exploitation of technical magnetization processes for nondestructive evaluation of materials”, Indira Gandhi Centre for Atomic Research, India, January 16, 2006
154. “Non-linear Behaviour in Magnetic Materials”, Institute of Electrical Engineers, Research Channel, Web Broadcast, June 7, 2006.
155. “Measurement of magnetization processes for nondestructive evaluation of materials”, Kobe University, Kobe, Japan, August 28, 2006.
156. “Measurement of magnetization processes for nondestructive evaluation of materials”, Iwate University, Morioka, Japan, August 31, 2006.
157. “Magnetic methods for nondestructive evaluation”, Newport and District Materials Society, 24 October 2006

158. “Non-linear behavior in magnetic materials”, Bernard Cooper Memorial Lecture, Physics Department, University of West Virginia, Morgantown., West Virginia, March 1, 2007.
159. “Application of magnetic techniques to NDE of radiation embrittlement, creep and fatigue damage in ferrous materials”, Tata Steel Company, Jamshedpur, India, April 12, 2007.
160. “Hysteresis and non-linear behavior in magnetic materials”, IEE Solent Branch, Southampton, October 11, 2007.
161. "Recent developments in advanced magnetoelastic and magnetocaloric materials", Indian Institute of Technology Madras, Chennai, India, March 31, 2008.
162. “Non linear modeling of magnetic materials”, Faculty of Engineering, University of Wollongong, Australia, June 25, 2008
163. “Biomedical Applications of Magnetism: Plans for Development of the Wolfson Centre for Magnetism”, School of Dentistry, University of Birmingham, August 29, 2008.
164. “Recent progress in magnetoelastic and magnetocaloric materials”, National Physical Laboratory, Teddington, September 8, 2008.
165. “Magnetic Hysteresis: Physical Principles”, Seminar series on magnetic materials and hysteresis modeling”, Department of Electrical Energy Systems and Automation, University of Ghent, Ghent, Belgium, September 10, 2008.
166. “Magnetic Hysteresis: Non linear modeling”, Seminar series on magnetic materials and hysteresis modeling”, Department of Electrical Energy Systems and Automation, University of Ghent, Ghent, Belgium, September 10, 2008.
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168. “Magnetic methods for nondestructive evaluation: examples, possibilities and limitations”, Seminar series on magnetic materials and hysteresis modeling, Department of Electrical Energy Systems and Automation, University of Ghent, Ghent, Belgium, September 10, 2008.
169. “Cation substituted cobalt ferrite – a new material for composite multiferroic applications”, Seagate Technology, Bloomington Heights, Minnesota, September 22, 2008.
170. “Examination of Universal Network for Magnetic Nondestructive Evaluation Round Robin samples using Barkhausen and Hysteresis techniques”, Universal Network for Magnetic Nondestructive Evaluation, Budapest, September 25, 2008.
171. “Magnetic Hysteresis Modeling: Jiles Atherton Approach **(Invited)**”, Workshop on Hysteresis Modelling, Vienna University of Technology, December 12, 2008.
172. “Exceptional properties of some new magnetostrictive and magnetocaloric materials” **(Invited)**, UK Magnetism Society Seminar on Advanced Functional Materials, 19 March 2009, National Physical Laboratory, Teddington, UK.

173. “New giant magnetocaloric materials for magnetic refrigeration applications”, University of Electronic Science and Technology of China, Chengdu, Sichuan, China, September 16, 2009.
174. “The development of new highly magnetostrictive materials for magnetic sensors”, University of Electronic Science and Technology of China, Chengdu, Sichuan, China, September 17, 2009.
175. “Applications of magnetic Barkhausen effect to the nondestructive detection of surface mechanical condition in steels”, University of Electronic Science and Technology of China, Chengdu, Sichuan, China, September 18, 2009.
176. “New highly magnetostrictive ferrite materials for multiferroic applications”, Department of Electrical, Electronic and Computer Engineering, University of Birmingham, February 5, 2010.
177. “Recent Developments in Highly Magnetoelastic and Highly Magnetocaloric Materials”, Royal Institute of Technology, Stockholm, Sweden, June 18<sup>th</sup>, 2010.
178. “Magnetocaloric Effect and Magnetic Refrigeration”, Dept. Electrical Engineering, Indian Institute of Technology Madras, Chennai, India, July 1<sup>st</sup>, 2010.
179. “Detection of Surface Stress and Hardness in Ground Steel Components using Magnetic Barkhausen Measurements”, Centre for Nondestructive Evaluation, Indian Institute of Technology Madras, Chennai, India, July 5<sup>th</sup>, 2010.
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182. “Magnetic Barkhausen Measurements for Detection of Surface Stress and Hardness in High Strength Steel”, Department of Materials Science & Engineering, University of Sheffield, September 15, 2010.
183. “Deep Brain Stimulation using Transcranial Magnetic Stimulation for Diagnostic and Therapeutic Purposes”, Indian Institute of Technology Madras, Chennai, March 9, 2011.
184. “Deep Brain Stimulation using Magnetic Fields in TMS”, Department of Electrical and Computer Engineering, University of Iowa, May 5<sup>th</sup>, 2011.
185. “The Magnetocaloric Effect and Magnetic Refrigeration”, Department of Materials Science & Engineering, University of Sheffield, UK, June 9, 2011.
186. “Detection of Surface Stress and Hardness in Ground Steel Components using Magnetic Barkhausen Measurements”, University of the Saarland, Germany, June 14, 2011.
187. “Deep Brain Stimulation using Magnetic Fields in Transcranial Magnetic Stimulation”, D. C. Jiles, University of Goettingen, Germany, June 16, 2011.
188. “Detection of Surface Stress and Hardness in Ground Steel Components using Magnetic Barkhausen Measurements”, University of Ilmenau, Germany, June 17, 2011.
189. “Deep Brain Stimulation using Magnetic Fields in TMS”, Osborn Research Club, Iowa State University, November 14, 2011.

190. “Non-linear magnetic modeling: breaking through the materials barrier”, Department of Electrical and Computer Engineering, McGill University, Montreal, Canada, November 22, 2011.
191. “Non-linear magnetic modeling: breaking through the materials barrier”, General Electric Company, Bangalore, India, December 8, 2011.
192. “TMS: Deep Brain Stimulation using Magnetic Fields”, Iowa Lutheran Hospital, Des Moines, Iowa, January 20, 2012.
193. “Pushing back the boundaries affects you too: research highlights from Electrical and Computer Engineering”, Ames Lions Club, February 23, 2012
194. “TMS: Deep Brain Stimulation using Magnetic Fields”, University of Iowa Medical School, April 6, 2012.
195. “Development of new highly magnetostrictive materials for magnetic sensors”, University of the Saarland, Saarbrücken, Germany, June 26, 2012
196. “Magnetocaloric Effect and Magnetic Refrigeration”, Department of Physics, University of Goettingen, June 29, 2012
197. “Deep Brain Stimulation using Magnetic Fields”, Sheffield University, July 5, 2012.
198. “Deep Brain Stimulation using Magnetic Fields”, School of Engineering, Cardiff University, July 6, 2012.
199. “Non-linear magnetic modeling: breaking through the materials barrier”, Wayne State University, December 6, 2012.
200. “Recent progress in magnetoelastic and magnetocaloric materials”, University of Minnesota, April 12, 2013.
201. “Theory and Modeling of the Barkhausen Effect: Applications to Nondestructive Testing”, Wolfson Centre for Magnetism, Cardiff University, June 18, 2013.
202. “Deep Brain Stimulation using Magnetic Fields for Non-invasive Therapy of Brain Disorders”, School of Engineering, Cardiff University, June 19, 2013.
203. “Non-linear modeling: breaking through the magnetic materials barrier”, Department of Earth Sciences, University of Cambridge, June 20, 2013.
204. “Deep Brain Stimulation using Magnetic Fields for non-invasive Therapy of Brain Disorders”, Department of Electrical Engineering, University of Florida, November 14, 2013.
205. “A fresh look at some familiar non-metallic magnetic compounds for applications in magnetoelectric sensors”, Department of Materials Engineering, Sheffield University, June 24, 2014.
206. “Transcranial Magnetic Stimulation for Non-invasive Treatment of Brain Disorders”, Department of Electrical Engineering, Technical University of Vienna, August 21, 2014.
207. “Theory and modeling of the magnetic Barkhausen effect”, Department of Physics, Technical University of Vienna, August 22, 2014.
208. “Transcranial Magnetic Stimulation for Treatment of Neurological Disorders”, Walter Reed National Military

Medical Center, Bethesda, Maryland, May 28, 2015.

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211. "Transcranial Magnetic Stimulation for Treatment of Neurological Disorders", School of Engineering, Cardiff University, Cardiff, Wales, U.K., June 30, 2015.
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## 19. CONFERENCE PAPERS

1. "The magnetic phase diagram of terbium", S.B. Palmer and D.C. Jiles. Rare Earths Conference, Birmingham, England, April 17-18, 1978.
2. "The magnetic phase diagrams of gadolinium and terbium", D.C. Jiles and S.B. Palmer. Institute of Physics Magnetism Symposium on Bloch Wall Dynamics, London, England, April 1979.
3. "The magnetic phase diagram of gadolinium", D.C. Jiles and S.B. Palmer. International Conference on Magnetism (ICM), Munich, West Germany, September 3-7, 1979.
4. "Magnetoelastic effects in some heavy rare earths", D.C. Jiles and S.B. Palmer. Australia & New Zealand Institutes of Physics Solid State Physics Conference, Auckland, New Zealand, February 1980.
5. "Third order elastic constants of erbium", (Invited Paper), D.C. Jiles and S.B. Palmer. . Australia & New Zealand Institutes of Physics Solid State Physics Conference, Wagga, NSW, Australia, February 1981.
6. "Domain magnetisation interpretation of magnetoelastic effects in gadolinium", D.J Martin, S.B. Palmer and D.C. Jiles. Rare Earths Conference, Birmingham, England, April 1981.
7. "A mean field model of the hysteresis mechanism in ferromagnetic materials", D.C. Jiles and D.L. Atherton. Canadian Association of Physicists Conference, Kingston, Ontario, Canada, June 1982.
8. "The development of an above-ground stress measurement method for pipelines", D.L. Atherton, D.C. Jiles, A. Teitsma and H. French. International Conference on Pipeline Inspection Methods, Edmonton, Canada, June 1983.
9. "Ferromagnetic hysteresis", D.C. Jiles and D.L. Atherton, International Magnetism Conference, Philadelphia, April 5-8, 1983.
10. "Effects of stress on the magnetisation of steel", D.C. Jiles and D.L. Atherton, International Magnetism Conference, Philadelphia, April 5-8, 1983.
11. "Theory of ferromagnetic hysteresis", (Invited Paper), D.C. Jiles and D.L. Atherton, Magnetism and Magnetic Materials Conference 1983.

12. "Ferromagnetic hysteresis and the effects of stress on magnetisation", (Invited Paper), D.C. Jiles. Third Conference on Properties and Applications of Magnetic Materials, Chicago, U.S.A. May, 1984.
13. "Application of hysteresis modelling to the nondestructive inspection of stress", (Invited Paper), D.C. Jiles, S. Habermehl and D.L. Atherton. First National Seminar on Nondestructive Inspection of Ferromagnetic Materials, Houston, Texas, March 1984.
14. "The influence of stress on the inspection of steel with particular reference to gas pipelines", D.L. Atherton, C. Welbourn and D.C. Jiles. Fifth Canadian Conference on Non Destructive Testing, Toronto, Canada, October 1984.
15. "Dependence of the anhysteretic magnetisation on stress in steel", L.G. Dobranski, D.C. Jiles and D.L. Atherton, 30<sup>th</sup> Conference on Magnetism and Magnetic Materials, San Diego, California, 27-30, November 1984.
16. "Influence of chemical composition and heat treatment on the magnetic properties of steel", S. Habermehl, D.C. Jiles and C.M. Teller. International Magnetism Conference, St. Paul, Minnesota, April 29-May 2, 1985.
17. "Magnetomechanical effects in steel and the influence of microstructure", D.L. Atherton, D.C. Jiles and C. Welbourn. Fourth Conference on the Properties and Applications of Magnetic Materials, Chicago, May 1985.
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19. "Piezo-optic properties of gadolinium", D.C. Jiles and M.P. Staines. International Conference on Magnetism (ICM), San Francisco, U.S.A., August 1985.
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21. "Microstructural dependence of the magnetic properties of the iron carbon system", S. Habermehl, D.C. Jiles, J.D. Verhoeven and H. Downing. International Conference on Magnetism (ICM), San Francisco, California, August 1985.
22. "Magnetic methods for non destructive evaluation", (Invited Paper), D.C. Jiles. Conference on Advanced Methods in Non Destructive Evaluation, Kingston, Canada, October 1985.
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51. "First principles calculation of the hysteretic magnetostriction as a function of stress", M.J.Sablik and D.C.Jiles. American Physical Society, Solid State Physics Meeting, St. Louis, March 20-24, 1989.
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423. "Anomalous behaviour in electrical transport properties in single crystal  $Gd_5Si_{1.8}Ge_{2.2}$  and polycrystalline  $Gd_5Si_{2.09}Ge_{1.91}$ ", R. L. Hadimani, Y. Melikhov, J. E. Snyder, D. C. Jiles. Presented at the International Magnetism Conference, Sacramento, California, May 4-8, 2009.
423. "Temperature dependence of magnetic properties of  $CoAl_xFe_{2-x}O_4$  for magnetostrictive sensor and actuator applications", N. Ranvah\*, I. Nlebedim\*, Y. Melikhov\*, J. E. Snyder\*, A. J. Moses\*, P. I. Williams\*, D. C. Jiles. Presented at the International Magnetism Conference, Sacramento, California, May 4-8, 2009
424. "Magnetic and Magnetomechanical Properties of  $CoAl_xFe_{2-x}O_4$  for Stress Sensor and Actuator Applications", I. Nlebedim, N. Ranvah, P.I. Williams, Y. Melikhov, J.E. Snyder, A.J. Moses and D.C. Jiles. Presented at the International Magnetism Conference, Sacramento, California, May 4-8, 2009.
425. "Design and Modeling of Improved Functionality of Switching Inductive Devices using Non-linear behavior of Core Materials", A.E. Umenei, Y. Melikhov, and D. C. Jiles. Presented at the International Magnetism Conference, Sacramento, California, May 4-8, 2009.
426. "Magnetic Materials and related Research at Cardiff University", **(Invited)**, at the Materials Network Wales, Symposium on Materials Research at Welsh Universities, Cwmbran, May 14<sup>th</sup>, 2009.
427. "Effect of Heat Treatment on Cation Distribution in Magnetostrictive  $CoFe_2O_4$ ", I. C Nlebedim, N. Ranvah, Y. Melikhov, P.I.Williams, J.E. Snyder, A. J. Moses and D.C. Jiles. Presented at the 8<sup>th</sup> Pacific Rim Conference on Ceramics and Glass Technology, American Ceramics Society, Vancouver, Canada, May 31- June 5, 2009.
428. "Development of Magnetic Stimulation Devices for Medical Applications", P.I.Williams, P.Marketos, E.Umenei, D.C.Jiles and J.Starzewski. International Society for Magnetic Resonance in Medicine, 15th Annual Meeting, Cardiff, Wales, 2-4, September, 2009.
429. "Irreversible resistivity response of half-metallic ferromagnets", Y. Melikhov, V.N. Krivoruchko, M.A.Marchenko and D.C. Jiles. 19<sup>th</sup> Conference on Soft Magnetic Materials, Turin, Italy, September 7-9, 2009.
430. "Generalized form of anhysteretic magnetization function for Jiles-Atherton theory of hysteresis", A. Raghunathan, Y. Melikhov, J. E. Snyder, and D. C. Jiles. 19<sup>th</sup> Conference on Soft Magnetic Materials, Turin, Italy, September 7-9, 2009.
431. "Investigation of the dependence of sensitivity of magnetostriction of cobalt ferrite to applied field on cation ratio and processing parameters", I. C. Nlebedim, N. Ranvah, P. I. Williams, Y. Melikhov, J. E. Snyder, A. J. Moses, D. C. Jiles. 19<sup>th</sup> Conference on Soft Magnetic Materials, Turin, Italy, September 7-9, 2009.
432. "Modeling of improvement in impedance transfer for inductive switching devices, using high permeability soft materials", A. E. Umenei, Y. Melikhov, D.C. Jiles. 19<sup>th</sup> Conference on Soft Magnetic Materials, Turin, Italy, September 7-9, 2009.

433. "Measurement of electrical steels with direct field determination", O. Stupakov, R. Wood, Y. Melikhov, D.C. Jiles. 19<sup>th</sup> Conference on Soft Magnetic Materials, Turin, Italy, September 7-9, 2009.
434. "Anomalous behaviour in electrical transport properties of single crystal  $\text{Gd}_5\text{Si}_{1.8}\text{Ge}_{2.2}$ ", R. L. Hadimani and D.C.Jiles. European Congress and Exhibition on Advanced Materials and Processes, (EUROMAT), Glasgow, Scotland, September 7-10, 2009.
435. "Magnetic Barkhausen Effect Method for Nondestructive Evaluation of Surface Microstructure and Stress", **(Invited Plenary Address)**, D.C.Jiles, L. Mierczak and P.I. Williams. 14<sup>th</sup> International Symposium on Applied Electromagnetics and Mechanics (ISEM), Xian, China, September 20-24, 2009.
436. "AC magnetic property measurements on cobalt ferrite for sensor applications", N. Ranvah, I. C. Nlebedim, Y. Melikhov, J. E. Snyder, A. J. Moses, P. I. Williams, and D. C. Jiles. Presented at the 11<sup>th</sup> Joint MMM/InterMag Conference, Washington DC, January 18-22, 2010.
437. "Detection of Damage in Ground Steel Components using Magnetic Barkhausen Noise", L. Mierczak, Y. Melikhov and D. C. Jiles. Presented at the 11<sup>th</sup> Joint MMM/InterMag Conference, Washington DC, January 18-22, 2010.
438. "Improved Model for Inductive Switching Devices in Power Systems", A. Umenei, E. Melikhov and D.C. Jiles. Presented at the 11<sup>th</sup> Joint MMM/InterMag Conference, Washington DC, January 18-22, 2010.
439. "Growth of Crystalline Cobalt ferrite Thin Films at Lower Temperatures using Pulsed-laser Deposition Technique", A. Raghunathan, I. C. Nlebedim, J. E. Snyder and D. C. Jiles. Presented at the 11<sup>th</sup> Joint MMM/InterMag Conference, Washington DC, January 18-22, 2010.
440. "Theoretical Model of Temperature Dependence of Hysteresis based on Mean Field Theory", A. Raghunathan, Y. Melikhov, J. E. Snyder and D. C. Jiles. Presented at the 11<sup>th</sup> Joint MMM/InterMag Conference, Washington DC, January 18-22, 2010.
441. "Resistivity Recovery in  $\text{Gd}_5(\text{Si}_x\text{Ge}_{1-x})_4$ ", R. L. Hadimani and D. C. Jiles. Presented at the 11<sup>th</sup> Joint MMM/InterMag Conference, Washington DC, January 18-22, 2010.
442. "Effect of Temperature Variation on the Magnetostrictive Properties of  $\text{CoAl}_x\text{Fe}_{2-x}\text{O}_4$ ", I. Nlebedim, N. Ranvah, Y. Melikhov, P.I. Williams, J.E. Snyder, A.J. Moses and D.C. Jiles. Presented at the 11<sup>th</sup> Joint MMM/InterMag Conference, Washington DC, January 18-22, 2010.
443. "Magnetocrystalline anisotropy in single crystal  $\text{Gd}_5\text{Si}_{2.7}\text{Ge}_{1.3}$ ". R.L.Hadimani and D.C.Jiles. APS March Meeting, Portland, Oregon, March 15-19, 2010.
444. "Deriving a functional form of anhysteretic magnetization function for Jiles-Atherton theory of hysteresis", A. Raghunathan, Y. Melikhov, J. E. Snyder, and D. C. Jiles. APS March Meeting, Portland, Oregon, March 15-19, 2010.
445. "Pulsed-laser deposition of crystalline cobalt ferrite thin films at lower temperatures", A. Raghunathan, I. C. Nlebedim, D. C. Jiles, and J. E. Snyder. APS March Meeting, Portland, Oregon, March 15-19, 2010.
446. "Effect of Chemical substitution on magnetoelastic properties of cobalt ferrite", D.C.Jiles, N.Ranvah, I.Nlebedim, Y.Melikhov, J.E.Snyder, A.J.Moses and P.I.Williams. APS March Meeting, Portland, Oregon, March 15-19, 2010.

447. "Detection of Surface Condition in Ground Steel Components using Magnetic Barkhausen Measurements" **(Invited Keynote Address)**, D. C. Jiles, L. Mierczak and Y. Melikhov, 15<sup>th</sup> International Workshop on Electromagnetic Nondestructive Evaluation (ENDE 15), Szczecin, Poland, 13–16 June 2010.
448. "Development of Field Coils for Diagnostic Applications of Transcranial Magnetic Stimulation", D. C. Jiles, P.I. Williams, E. Umenei, P. Marketos, L. Crowther, J. Starzewski, A. Thomas and G.A.Thomas. 15<sup>th</sup> International Workshop on Electromagnetic Nondestructive Evaluation (ENDE 15), Szczecin, Poland, 13–16 June 2010.
449. "A new way of determining the depth dependence of residual stress using the magnetic Barkhausen effect", L.Mierczak and D.C.Jiles. Review of Progress in Quantitative NDE, San Diego, California, July 18-23, 2010.
450. "Thermodynamic aspects of hysteresis for half metallic ferromagnets", Y.Melikhov, V.N.Krivoruchko and D.C.Jiles. Presented at the Joint European Magnetism Symposia, Krakow, Poland, August 23 - 28, 2010.
451. "Modelling of two-phase magnetic materials based on J-A theory", A. Raghunathan, Y. Melikhov, J. E. Snyder, and D. C. Jiles. Presented at the Joint European Magnetism Symposia, Krakow, Poland, August 23 - 28, 2010.
452. "Transcranial Magnetic Stimulation: improved coil design for deep brain investigation", L.J. Crowther, P.I. Williams, Y. Melikhov, D.C. Jiles. Presented at the Magnetism and Magnetic Materials Conference, Atlanta, Georgia, November 15 -18, 2010.
453. "Modeling ,Validation and Implementation of Non-Linear Magnetic Switching for Device Applications", A.E. Umenei, Y. Melikhov, D.C. Jiles. Presented at the Magnetism and Magnetic Materials Conference, Atlanta, Georgia, November 15 -18, 2010.
454. "Influence of Reactive Atmosphere on Properties of Cobalt ferrite Thin Films Prepared using Pulsed-laser Deposition", A. Raghunathan, J.E.Snyder and D.C. Jiles. Presented at the Magnetism and Magnetic Materials Conference, Atlanta, Georgia, November 15 -18, 2010.
455. "Dependence of Magnetomechanical Performance of Ga-Substituted Cobalt Ferrite on Temperature Variation", I.C. Nlebedim, Y. Melikhov, J.E. Snyder, A.J. Moses and D.C. Jiles. Presented at the Magnetism and Magnetic Materials Conference, Atlanta, Georgia, November 15 -18, 2010.
456. "Reconstructing Residual Stress Depth Profiles using Magnetic Barkhausen Noise Method", L. Mierczak, Y Melikhov, D.C. Jiles. Presented at the Magnetism and Magnetic Materials Conference, Atlanta, Georgia, November 15 -18, 2010.
457. "Magnetic NDE for damage assessment of structural materials", **(Invited paper)**, Workshop on Advanced Nondestructive Evaluation for Structural Integrity Assessment, December 7, 2010, Science City Convention Center, Kolkata, India.
458. "Modeling of Micromagnetic NDT", **(Invited paper)**, Symposium on Signal Analysis, Simulation and Modeling, December 8, 2010, Science City Convention Center, Kolkata, India.
459. "NDE for Life Cycle Management in Power Generation", (Invited Keynote Address), National Seminar on Non-Destructive Testing & Evaluation, Science City Auditorium, Kolkata, India, 9-11 December, 2010.
460. "Theoretical Modelling for Interpretation of Magnetic Nondestructive Evaluation Measurements" **(Invited)** D.C. Jiles. 16th International Workshop on Electromagnetic Nondestructive Evaluation (ENDE 2011), Chennai, India, March 10-12, 2011.

461. "Deep Brain Stimulation using Magnetic Fields", D.C.Jiles, P.I.Williams and L.J.Crowther. Presented at the APS March Meeting, Dallas, Texas, March 21-25, 2011.
462. "Stress and Depth Dependence of Stochastic Processes in the Barkhausen Effect", L. Mierczak, Y. Melikhov, D.C. Jiles. Presented at the APS March Meeting, Dallas, Texas, March 21-25, 2011.
463. "Magnetic modelling - breaking through the materials barrier" (**Invited Keynote Address**) D.C.Jiles, Eighth International Conference on Computation in Electromagnetics, Wroclaw, Poland, 11-14 April 2011.
464. "Magnetic Annealing and Inverse Magnetostrictive Effects in Cobalt Ferrite Thin Films", A. Raghunathan, D. C. Jiles, and J. E. Snyder. Presented at the International Magnetism Conference, Taipei, Taiwan, April 25-29, 2011.
465. "Coil design optimization using structurally detailed head model for Transcranial Magnetic Stimulation", L.J. Crowther and D.C. Jiles. Presented at the International Magnetism Conference, Taipei, Taiwan, April 25-29, 2011.
466. "Applications of the Barkhausen effect", (**Invited Plenary Address**), Workshop on Large Fluctuations and Collective Phenomena in Disordered Materials, University of Illinois, Urbana- Champaign, May 18, 2011.
467. "Improved Designs for Field Generation for Non Invasive Transcranial Magnetic Stimulation", L. Crowther and D. C. Jiles. Review of Progress in Quantitative NDE, Vermont, July 18-22, 2011.
468. "Depth profiling in prestressed load bearing components", L.Mierczak, O.Kypris, I.Nlebedim and D.C.Jiles, Review of Progress in Quantitative NDE, Vermont, July 18-22, 2011.
469. "Residual stress depth profiling using Magnetic Barkhausen Noise method ", L. Mierczak, Y. Melikhov, D. C. Jiles. Presented at the British Institute of Non-Destructive testing conference on Materials Testing, The International Centre, Telford, Shropshire, UK September 13-15, 2011.
470. "Effect of deviation from stoichiometric composition on structural and magnetic properties of cobalt ferrite,  $\text{Co}_x\text{Fe}_{3-x}\text{O}_4$  ( $x = 0.2$  to  $1.0$ )", I. C. Nlebedim, J. E. Snyder, A. J. Moses, and D. C. Jiles. Presented at the 56<sup>th</sup> Conference on Magnetism and Magnetic Materials, Scottsdale, Arizona, October 31- November 4, 2011.
471. "Description of Magnetic Two-phase Materials in the Theory of Hysteresis", A. Raghunathan, Y. Melikhov, J. E. Snyder, and D. C. Jiles. Presented at the 56<sup>th</sup> Conference on Magnetism and Magnetic Materials, Scottsdale, Arizona, October 31- November 4, 2011.
472. "A more robust method for parameter determination for Jiles-Atherton Theory of Hysteresis", A. Raghunathan, Y. Melikhov, and D. C. Jiles. Presented at the 56<sup>th</sup> Conference on Magnetism and Magnetic Materials, Scottsdale, Arizona, October 31- November 4, 2011.
473. "Developments in Deep Brain Stimulation using Time Dependent Magnetic Fields", L. J. Crowther, I. C. Nlebedim and D. C. Jiles. Presented at the 56<sup>th</sup> Conference on Magnetism and Magnetic Materials, Scottsdale, Arizona, October 31- November 4, 2011.
474. "Depth Profiling of Stress for Non-Destructive Testing using Magnetic Barkhausen Noise Signals", O. Kypris, L. Mierczak, I. C. Nlebedim and D.C. Jiles. Presented at the 56<sup>th</sup> Conference on Magnetism and Magnetic Materials, Scottsdale, Arizona, October 31- November 4, 2011.
475. "Depth dependence of mechanical properties from micromagnetic emissions", L. Mierczak, Y. Melikhov, O.Kypris and D.C.Jiles. Presented at the 55<sup>th</sup> Conference on Magnetism and Magnetic Materials, Scottsdale, Arizona, October 31- November 4, 2011.

476. "Frequency dependent magnetic measurements for depth profiling of properties in steels", D.C.Jiles, O.Kypris, L.Mierczak and Y.Melikhov, National Seminar on Nondestructive Testing & Evaluation, Indian Society for Nondestructive Testing, Chennai, India, December 8-10, 2011.
477. "Determination of Second Order Phase Transition Temperature of Monoclinic Phase of  $Gd_5(Si_xGe_{1-x})_4$ ", R. Hadimanin, D.C.Jiles and Y.Melikhov. American Physical Society March Meeting, Boston, Massachusetts, March 2012.
478. "The Origin of Secondary Hematite Phase in Non-stoichiometric Co-ferrite Samples Prepared by Ceramic Method", D.C.Jiles, I. Nlebedim and A..J. Moses. American Physical Society March Meeting, Boston, Massachusetts, March 2012.
479. "Calculation of Lorentz Forces on Coils for Transcranial Magnetic Stimulation", L. J. Crowther, R. L. Hadimani, D. C. Jiles. Presented at the International Magnetism Conference, Vancouver, Canada, May 7-11, 2012.
480. "Mapping Stress along Depth at the Surface of Steel Structures using a frequency dependent Magnetic Barkhausen Noise Technique", O. Kypris, I.C. Nlebedim and D.C. Jiles. Presented at the International Magnetism Conference, Vancouver, Canada, May 7-11, 2012.
481. "Study of the second order phase transition temperature of monoclinic phase in mixed phase region of  $Gd_5(Si_xGe_{1-x})_4$ ", R. L. Hadimani, Y. Melikhov and D. C. Jiles. Presented at the International Magnetism Conference, Vancouver, Canada, May 7-11, 2012.
482. "Magnetocrystalline anisotropy in single crystal  $Gd_5Si_{2.7}Ge_{1.3}$ ", R. L. Hadimani, Y. Melikhov, M. Han and D. C. Jiles. Presented at the International Magnetism Conference, Vancouver, Canada, May 7-11, 2012.
483. "Anisotropy and Magnetostrictive Properties of Non-stoichiometric Co-Ferrite", I. C. Nlebedim, J. E. Snyder, A. J. Moses and D. C. Jiles. Presented at the International Magnetism Conference, Vancouver, Canada, May 7-11, 2012.
484. "Growth and Characterization of Magnetocaloric  $Gd_5(Si_xGe_{1-x})_4$  Thin Films", R.L.Hadimani, Y.Melikhov and D.C.Jiles. Presented at the 12<sup>th</sup> Joint Magnetism and Magnetic Materials / International Magnetism Conference, Chicago, Illinois, January 14-18, 2013.
485. "Magnetic and Thermoelectric Properties of Cobalt Ferrite", I.C.Nlebedim, R.L.Hadimani, R.Prozorov and D.C.Jiles. Presented at the 12<sup>th</sup> Joint Magnetism and Magnetic Materials / International Magnetism Conference, Chicago, Illinois, January 14-18, 2013.
486. "Structural, Magnetic and Magnetoelastic Properties of Magnesium Substituted Cobalt Ferrite", I. C Nlebedim, R. Hadimani, R. Prozorov and D. C. Jiles. Presented at the 12<sup>th</sup> Joint Magnetism and Magnetic Materials / International Magnetism Conference, Chicago, Illinois, January 14-18, 2013.
487. "Experimental verification of the linear relationship between stress and the reciprocal of the peak Barkhausen voltage in ASTM A36 steel", O. Kypris, I.C. Nlebedim, D.C. Jiles. Presented at the 12<sup>th</sup> Joint Magnetism and Magnetic Materials / International Magnetism Conference, Chicago, Illinois, January 14-18, 2013.
488. "Stress - depth profiling for non-destructive evaluation using a frequency-dependent model of Barkhausen emissions", O. Kypris, I.C. Nlebedim, D.C. Jiles. Presented at the 12<sup>th</sup> Joint Magnetism and Magnetic Materials / International Magnetism Conference, Chicago, Illinois, January 14-18, 2013.

489. “Realistically modeled TMS-coils for stress and Lorentz force calculations during MRI”, L.J.Crowther, K.Porzig, R.L.Hadimani, H.Brauer and D.C. Jiles. Presented at the 12<sup>th</sup> Joint Magnetism and Magnetic Materials / International Magnetism Conference, Chicago, Illinois, January 14-18, 2013.
490. “Magnetoelectric properties of GaCoFeO/BaTiO<sub>3</sub> composite”, Y.Ni, I.C.Nlebedim, H.Xu and D.C.Jiles. Presented at the 24<sup>th</sup> Annual Conference on Fundamental Physics of Ferroelectrics and Related Materials, Ames, Iowa, January 27-30, 2013.
491. “Magnetostrictive cation substituted cobalt ferrite for magnetoelectric applications”, I.C.Nlebedim and D.C.Jiles. Presented at the 24<sup>th</sup> Annual Conference on Fundamental Physics of Ferroelectrics and Related Materials, Ames, Iowa, January 27-30, 2013.
492. “Ferroelectric and ferromagnetic properties of Ga<sub>x</sub> CoFe<sub>2-x</sub>O<sub>4</sub> /BaTiO<sub>3</sub>”, Y. Ni, C.Nlebedim and D.C.Jiles.. Presented at the American Physical Society March Meeting, Baltimore, Maryland, March 18-22, 2013.
493. “How Magnesium Substitution Changes the Magnetostrictive Properties of Cobalt Ferrite”, I.C.Nlebedim, and D.C.Jiles. Presented at the American Physical Society March Meeting, Baltimore, Maryland, March 18-22, 2013.
494. “The Effect of Variation of Permittivity and Conductivity on Induced Electric Field in the Brain during Transcranial Magnetic Stimulation” L.Crowther, R.L.Hadimani and D.C.Jiles. Presented at the American Physical Society March Meeting, Baltimore, Maryland, March 18-22, 2013.
495. “First successful growth of thin films of meta-stable monoclinic phase of Gd<sub>5</sub>(Si<sub>x</sub>Ge<sub>1-x</sub>)<sub>4</sub>”, R.L.Hadimani and D.C.Jiles. Presented at the American Physical Society March Meeting, Baltimore, Maryland, March 18-22, 2013.
496. “Anisotropy and Magnetostriction in Cobalt-Modified Magnetite: A Crystal Field Approach”, I.C.Nlebedim and D.C.Jiles. Presented at the American Physical Society March Meeting, Baltimore, Maryland, March 18-22, 2013.
497. “Computation of the modified magnetostriction coefficient  $b'$  corresponding to different depth ranges in ferromagnetic specimens by using a frequency dependent model for magnetic Barkhausen emissions”, O.Kypris, I.C.Nlebedim and D.C.Jiles. Presented at the American Physical Society March Meeting, Baltimore, Maryland, March 18-22, 2013.
498. “Verification of modified Jiles-Atherton model for determination of hysteresis behavior of materials with two magnetic phases”, N. Prabhu Gaunkar and D.C.Jiles. Presented at the American Physical Society March Meeting, Baltimore, Maryland, March 18-22, 2013.
499. “Improved transcranial magnetic stimulation coil design with realistic head modeling”, L. J. Crowther, R. L. Hadimani, D. C. Jiles. Presented at the American Physical Society March Meeting, Baltimore, Maryland, March 18-22, 2013.
500. “Effect of Transcranial Magnetic Stimulation on Neuronal Networks”, A. H. Unsal, R. L. Hadimani and D. C. Jiles. Presented at the American Physical Society March Meeting, Baltimore, Maryland, March 18-22, 2013.
501. “Realistically modeled TMS-coils for stress and Lorentz force calculations during MRI”, K. Porzig, L. J. Crowther, R. L. Hadimani, H. Brauer, J. Haueisen, H. Toepfer, D. C. Jiles, Presented at the 5th International Conference on Non-Invasive Brain Stimulation, Leipzig, Germany, 19-21 March ,2013.



502. "The Effect of Variation of Permittivity and Conductivity on Induced Electric Field in the Brain during Transcranial Magnetic Stimulation", K. Porzig, R. L. Hadimani, L. J. Crowther, H. Brauer, J. Haueisen, H. Toepfer, D. C. Jiles. Presented at the 5th International Conference on Non-Invasive Brain Stimulation, Leipzig, Germany, 19-21 March, 2013.
503. "Theory and modeling of the Barkhausen effect", D.C.Jiles. Presented at the Symposium on Crackling Noise and Intermittency in Condensed Matter, Göttingen, Germany, 22- 24 May, 2013.
504. "The Barkhausen effect: modeling and application to NDE of stress" (Plenary Address), D.C.Jiles, International Conference on Barkhausen Measurements, Review of Progress in Quantitative NDE, Baltimore, Maryland, July 22-26, 2013.
505. "MBN Techniques for Quantitative Determination of Stress", Y. Melikhov, L. Mierczak, D.C. Jiles. International Conference on Barkhausen Measurements, Review of Progress in Quantitative NDE, Baltimore, Maryland, July 22-26, 2013.
506. "Applicability of modified J-A model for improved interpretation of hysteresis measurements for evaluation of ferromagnetic materials and components", N. Prabhu Gaunkar, I. C. Nlebedim and D.C. Jiles. International Conference on Barkhausen Measurements, Review of Progress in Quantitative NDE, Baltimore, Maryland, July 22-26, 2013.
507. "Calculation of a universal stress-depth calibration profile using a white noise approximation to the magnetic Barkhausen noise spectrum", O.Kypris, I.C.Nlebedim and D.C.Jiles, International Conference on Barkhausen Measurements, Review of Progress in Quantitative NDE, Baltimore, Maryland, July 22-26, 2013.
508. "Development of Deep Brain and Focused Transcranial Magnetic Stimulation Coil for Mice", R. L. Hadimani, S. D. March, S. McAtee, M. Senter, K. Spoth, D. R. Stiner, L. J. Crowther and D. C. Jiles. Presented at the 58<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, November 4-8, 2013.
509. "Transcranial Magnetic Stimulation of Mouse Brain Using High-Resolution Anatomical Models", L. J. Crowther, R. L. Hadimani, A. G. Kanthasamy, D. C. Jiles. Presented at the 58<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, November 4-8, 2013.
510. "Growth and Characterization of Pt-protected Gd<sub>5</sub>Si<sub>4</sub> thin films", R. L. Hadimani, Y. Mudryk, T. E. Prost, V. K. Pecharsky, K. A. Gschneidner, and D. C. Jiles. Presented at the 58<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, November 4-8, 2013.
511. "Evolution of Griffiths Phase in La<sub>0.4</sub>Bi<sub>0.6</sub>Mn<sub>1-x</sub>Ti<sub>x</sub> O<sub>3</sub> Perovskite Oxide", V. Dayal, K.V. Punith, R. L. Hadimani and D. C. Jiles. Presented at the 58<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, November 4-8, 2013.
512. "Influence of Initial Particle Size Distribution on Magnetostrictive Properties of Cobalt Ferrite", I. C. Nlebedim and D. C. Jiles. Presented at the 58<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, November 4-8, 2013.
513. "Effect of Ti<sup>4+</sup>/Co<sup>2+</sup> Co-substitution on the Structural and Magnetic Properties of Cobalt Ferrite", I. C. Nlebedim, K. W. Dennis, R. W. McCallum and D. C. Jiles. Presented at the 58<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, November 4-8, 2013.

514. “Magnetocaloric effect in  $\text{GdCo}_x\text{Al}_{2-x}$  system for  $0.15 \leq x \leq 1$  compositions”, H. Fu, R. L. Hadimani, M. H. Wang; B. H. Teng and D. C. Jiles. Presented at the 58<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, November 4-8, 2013.
515. “A Comparative Study of Probe Designs for Detection of Magnetic Barkhausen Emissions”, N. Prabhu Gaunkar, I.C.Nlebedim and D.C.Jiles. Presented at the 58<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, November 4-8, 2013.
516. “Barkhausen spectroscopy: Non-destructive characterization of magnetic materials as a function of depth”, O. Kypris, I.C. Nlebedim, D.C. Jiles. Presented at the 58<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, Colorado, November 4-8, 2013.
517. “Transcranial Magnetic Stimulation of Mouse Brain Using High-Resolution Anatomical Models”, L. J. Crowther, R. L. Hadimani, A. Kanthasamy and D. C. Jiles. Submitted to IEEE Transactions on Biomedical Engineering.
518. “A Numerical Dosimetry Study for Pediatric Transcranial Magnetic Stimulation”, L. J. Crowther, R. L. Hadimani, and D. C. Jiles. Presented at the 6th International IEEE EMBS Conference on Neural Engineering, San Diego, November 6-8, 2013.
519. “Focused and Deep Brain Magnetic Stimulation Using New Coil Design in Mice”, S. D. March, S. Stark, M. Senter, K. Spoth, D. R. Stiner, L. J. Crowther, R. L. Hadimani, D. C. Jiles. Presented at the 6th International IEEE EMBS Conference on Neural Engineering, San Diego, November 6-8, 2013.
520. “New coil designs for deep brain Transcranial Magnetic Stimulation using Halo Coil Configurations”, R. Kaul, B. N. Hogan, R. L. Hadimani, L. J. Crowther, D. C. Jiles. Presented at the 6th International IEEE EMBS Conference on Neural Engineering, San Diego, November 6-8, 2013.
521. “Increased efficiency of a permanent magnet synchronous generator through optimization of NdFeB magnet arrays”, H. Khazdozian, R.Hadimani and D.C.Jiles. Presented at the American Physical Society March Meeting, Denver, Colorado, March 3-7, 2014.
532. “Effect of titanium substitution on the structural and magnetic properties of cobalt ferrite”, I.C.Nlebedim and D.C.Jiles. Presented at the American Physical Society March Meeting, Denver, Colorado, March 3-7, 2014.
523. “Design considerations for a high sensitivity Barkhausen noise sensor”, N. Prabhu Gaunkar., O.Kypris, C. Nlebedim and D.C. Jiles. Presented at the American Physical Society March Meeting, Denver, Colorado, March 3-7, 2014.
524. “Development of a new magnetic Barkhausen spectroscopy method for the nondestructive characterization of magnetic materials”, O.Kypris, I.Nlebedim and D.C.Jiles. Presented at the American Physical Society March Meeting, Denver, Colorado, March 3-7, 2014.
525. “Pulsed laser deposition of thin films of binary compounds of Gd and Si using a femto-second laser”, R.L.Hadimani Y.Mudryk, T.Prost, V.Pecharsky, K.A.Gschneidner and D.C.Jiles. Presented at the American Physical Society March Meeting, Denver, Colorado, March 3-7, 2014.
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559. “Comparison of Coil Designs for Transcranial Magnetic Stimulation on Mice”, American Physical Society March Meeting, March 2-6, 2015.
560. “Determination of stimulation focality in heterogeneous head models during transcranial magnetic stimulation (TMS)”, American Physical Society March Meeting, March 2-6, 2015.
561. “First Successful Fabrication of Nanoparticles of magnetocaloric  $\text{Gd}_5\text{Si}_4$ ”, American Physical Society March Meeting, March 2-6, 2015.
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569. Deep Transcranial Magnetic Stimulation for the Treatment of Neurological Disorders (**Keynote address**),

D. C. Jiles, R. L. Hadimani and P. Rastogi presented at the 4<sup>th</sup> International Conference on Biosensors and Bioelectronics, Atlanta, Georgia, September 28-30, 2015.

570. "Ultrahigh Sensitivity of Anomalous Hall Effect Sensor Based on Cr-doped Bi<sub>2</sub>Te<sub>3</sub> Topological Insulator Thin Films", Yan Ni; Zhen Zhang, Cajetan I. Nlebedim, Ravi L. Hadimani, David C. Jiles. To be presented at the 13<sup>th</sup> Joint MMM/InterMag Conference, San Diego, California, January 11-15, 2016.
571. "Investigation of Depth and Focality of Different Coil Designs During Transcranial Magnetic Stimulation in Mice", Priyam Rastogi, Ravi L. Hadimani, David C. Jiles. To be presented at the 13<sup>th</sup> Joint MMM/InterMag Conference, San Diego, California, January 11-15, 2016.
572. "Use of Non Rare Earth Permanent Magnets in Halbach Cylinder Rotor Permanent Magnet Generator", Helena A. Khazdozian, Ravi L. Hadimani, David C. Jiles. To be presented at the 13<sup>th</sup> Joint MMM/InterMag Conference, San Diego, California, January 11-15, 2016.
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## 20. REFEREED JOURNAL PUBLICATIONS

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