

---

## ACADEMIC RESUME

Marcus J. Johnson  
347 Laurie Road East  
Maplewood, MN 55117-1838

e-mail: [marcusj@emsensors.com](mailto:marcusj@emsensors.com)  
Tel: (651) 771-1723  
Fax: (651) 771-1729

### EDUCATION

**The University of Surrey**, Guildford, Surrey, United Kingdom  
Ph. D. in Physics, 1997.

Thesis title: “*Transient eddy-currents for the characterization of thin layers and surface treatments.*”

**Sheffield City Polytechnic**, Sheffield, South Yorkshire, United Kingdom  
BSc (Honors) in Engineering Physics; 2-I (UK grade system)

### TEACHING HIGHLIGHTS

Directly supervised graduate students working at the Center for Nondestructive Evaluation. Assisted students with their research and acted as a mentor to them.

Supervised numerous Senior Design Project teams from ISU’s E&CE department and Integrated Design students from the MSE department.

Received a letter of acknowledgment from the Vice President of Student Affairs as a person who has contributed to the outstanding achievements of a student scholar. Attended the student award ceremony at Stephens Auditorium in this capacity.

Mentored undergraduate and high-school Program for Women in Science and Engineering (PWSE) students.

Operated graduate and undergraduate laboratory classes at the University of Surrey teaching microcontroller and microprocessor hardware systems and programming. Graded assignments.

Ran the laboratory portion of a FORTRAN programming class at the University of Surrey. Graded assignments.

### RESEARCH INTERESTS

Experimental electromagnetism for

- eddy-current and magnetic nondestructive evaluation
- pulsed eddy-current nondestructive evaluation
- electrical and magnetic sensors

Novel (nanoparticle) materials deposition techniques for

- high-density and conformal interconnects
- miniature sensors

Materials characterization

- electromagnetic profiling of steels
- characterization of thin layers and surface treatments using high-frequency techniques
- assessment of residual stress

## **CURRENT AND PREVIOUS POSITIONS**

**Senior Applications Engineer**, Optomec Inc. (technology for depositing nano-particle inks)

Work with universities and industry to develop new applications for Optomec's technology, primarily in the area of electromagnetic sensors and interconnects for the semiconductor industry. Job function includes proposal writing, fundamental research and customer applications development.

**Associate Scientist**, Iowa State University, -2005

**Research Associate**, Iowa State University

Conducted research under CNDE's Industry/University NSF program in addition to Air Force, FAA, and NASA programs. Played a key role in many of these programs and was involved in reporting activities. Research areas included the interaction of conventional and pulsed eddy currents with stratified ferromagnetic conductors as well as the use of eddy currents for materials characterization and inspection. Numerous supervisory activities involving postdoctoral fellows, graduate and undergraduate students.

**Postdoctoral Research Fellow**, Ames Laboratory and Iowa State University

Split appointment between Ames Laboratory and the Center for Nondestructive Evaluation. Worked in the area of magnetic and eddy-current nondestructive evaluation under the NSF Industry/University program.

**Postdoctoral Research Fellow**, The University of Surrey, Surrey, United Kingdom

**Researcher**, Sheffield City Polytechnic, Sheffield, South Yorkshire, United Kingdom

**Engineer**, Schlumberger Industries, Bognor Regis, West Sussex, United Kingdom

## **OTHER POSITIONS AND INFORMATION**

**President of Electromagnetic Sensor Solutions, Inc.** A small company specializing in the sale of position transducers and providing design consultancy in the areas of nondestructive evaluation and industrial sensing.

Chaired sessions at both QNDE and ENDE conferences in the field of nondestructive evaluation.

Participated in NSF panel reviews.

**Patent application.** Patent # 20050184729, *Method and Apparatus for Forming Coil for use in Eddy Current Sensing Probe*, applied for 2005.

**Invited review paper.** Journal of Nondestructive Evaluation, **TITLE**, published by the Indian Society for Nondestructive Evaluation.

**Reviewer for:**

- IEEE Transactions on Magnetism
- Journal of Nondestructive Evaluation
- Journal of Materials Research
- Electromagnetic Nondestructive Evaluation
- Nondestructive Testing and Evaluation international

**PUBLICATIONS (99 onwards for now)**

B. Zhu, M. J. Johnson, C. C. H. Lo and D. C. Jiles, Multifunction Magnetic Barkhausen Emission Measurement System, IEEE Transactions on Magnetism, Vol. 37, No. 3, May 2001, pp1095.

B. Zhu, M. J. Johnson, C. C. H. Lo and D. C. Jiles, Evaluation of Wear-Induced Material Loss in Case-Hardened Steel using Magnetic Barkhausen Emission Measurements, IEEE Transactions on Magnetism, Vol. 37, No. 3, May 2001, pp1095.

M. J. Johnson, R. Chen, D. C. Jiles and V. R. Ramanan, Reducing Core Losses in Amorphous Fe<sub>80</sub>B<sub>12</sub>Si<sub>8</sub> Ribbons by Laser-Induced Domain Refinement, Proceedings of INTERMAG '99, Korea, GE-06.

M. J. Johnson, R. Chen, D. C. Jiles and V. R. Ramanan, Reducing Core Losses in Amorphous Fe<sub>80</sub>B<sub>12</sub>Si<sub>8</sub> Ribbons by Laser-Induced Domain Refinement, IEEE Transactions on Magnetism, Vol. 35, No. 5, pp3865.

V. J. Garcia, D. M. Clatterbuck, C. C. H. Lo, M. J. Johnson and D. C. Jiles, Dynamical Assessment of Magnetic Barkhausen Signals, Review of Progress in Quantitative Nondestructive Evaluation, Vol. 19A, pp781.

M. J. Johnson, J. Zhou, B. Shun N. Nakagawa and D. C. Jiles, Evaluation of Wear-Induced Material Loss in Case-Hardened Steel, Review of Progress in Quantitative Nondestructive Evaluation, Vol. 19B, pp1465.

D. M. Clatterbuck, V. J. Garcia, M. J. Johnson and D. C. Jiles, Modeling of the Magnetic Barkhausen Effect, Review of Progress in Quantitative Nondestructive Evaluation, Vol. 19B, pp1533.

M. J. Johnson, B. Zhu, C. C. H. Lo, D. C. Jiles and R. E. Shannon, The Effects of Aging Time and Temperature on the Magnetic Properties of Nickel Alloys, Review of Progress in Quantitative Nondestructive Evaluation, Vol. 20B, pp1429.

B. Zhu, M. J. Johnson, C. C. H. Lo and D. C. Jiles, Evaluation of Wear-Induced Material Loss in Case-Hardened Steel using Magnetic Barkhausen Emission Measurements, IEEE Transactions on Magnetism, Vol. 37, No. 3, May 2001, pp1095.

M. J. Johnson, C. C. H. Lo, B. Zhu, H. Cao and D. C. Jiles, Magnetic Measurements for NDE: Background, Implementation and Applications, Invited Review article for the Indian Society for Non-Destructive Testing's Journal of Non-Destructive Evaluation, Vol. 20, No. 4, p11-, 2000.

D. J. Brown, C. M. Hils and M. J. Johnson, Massively Multiplexed Eddy Current Testing and Its Comparison with Pulsed Eddy Current, Review of Progress in Quantitative Nondestructive Evaluation, in press.

D. Utrata and M. J. Johnson, Development of Magnetic Particle Method for Forensic Recovery of Serial Numbers, Review of Progress in Quantitative Nondestructive Evaluation, in press.

M. J. Johnson, C. C. H. Lo, and L. Naidu, Hall-Effect Measurements Under AC Excitation for the Reconstruction of Obliterated Serial Numbers in Magnetic Steels, Review of Progress in Quantitative Nondestructive Evaluation, in press.

M. J. Johnson, J. R. Bowler and F. Azeem, Pulsed Eddy-Current NDE at Iowa State University — Recent Progress and Results, Review of Progress in Quantitative Nondestructive Evaluation, Vol. 22, pp390.

M. J. Johnson, D. C. Jiles, C. C. H. Lo, P. Zombo, and B. Zhu, Magnetic NDE measurements on 410 stainless steel: An on-site and Laboratory Evaluation, Review of Progress in Quantitative Nondestructive Evaluation, Vol. 21, pp1591.

M. J. Johnson, L. C. Kerdus, C. C. H. Lo, J. E. Snyder, J. Leib, S. J. Lee, M. Mina, and D. C. Jiles, Studies on the effects of pulsed-magnetic field treatment on magnetic materials, Review of Progress in Quantitative Nondestructive Evaluation, Vol. 21, pp1569.

H. Sun, J. R. Bowler, N. Bowler, and M. J. Johnson, Eddy Current Measurements on Case Hardened Steel, Review of Progress in Quantitative Nondestructive Evaluation, Vol. 21, pp1561.