

# John Charles Fothergill

B.Sc. M.Sc. Ph.D. MInstP FIEE FIEEE C.Eng.

Professor of Engineering and Pro Vice Chancellor, University of Leicester

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Date of birth: 29 December 1953

Nationality: British

Marital Status: Married with two children

## Academic and Professional Qualifications and Awards

1972 - 79 University College of North Wales, Bangor:  
B.Sc. (Hons.) *Electronic Engineering* (1975)  
M.Sc. (Distinction) *Electrical Materials and Devices* (1976)  
Ph.D. *Electronic Properties of Biopolymers* (1979)

*Institute of Physics*: Member and Chartered Physicist since 1985

*Institution of Electrical Engineers (IEE)*: Member and Chartered Engineer since 1985,  
Fellow since 1999

*Institute of Electrical and Electronic Engineers (IEEE)*: Senior Member since 1992, awarded Fellowship in 2005 “for contributions to reliability methodology in the aging processes of electrical insulation systems”. (The award of IEEE Fellow is considered prestigious – the total number of fellows selected in any one year does not exceed 0.1% of the total voting Institute membership.)

## Professional History

1984 – present: University of Leicester  
2003: Pro-Vice-Chancellor  
2001: Dean, Faculty of Science  
2000: Professor (Personal Chair) of Engineering  
1993: Senior Lecturer, Engineering  
1984: Lecturer, Engineering

1979 - 84 Standard Telecommunications Laboratory (STL), Harlow  
Senior Research Engineer

I also am Chairman of the Board of Leicester Academic Library Services.

## Current Duties and Responsibilities

### Learning, Teaching and Student Support

My principal responsibility as Pro-Vice-Chancellor (Learning and Teaching) is to maintain and enhance the quality of the academic environment of the student body. Since I became Pro-Vice-Chancellor the university has done particularly well within this remit:

- Leicester has topped the list of universities teaching full-time students in terms of overall satisfaction in the new National Student Survey. Leicester scored 4.3 out of 5 overall for student satisfaction. The University was also ranked joint 1st for teaching quality, academic support and personal development in the survey amongst universities teaching full-time students.
- The University of Leicester has been awarded funding for three Centres for Excellence in Teaching and Learning (Genetics, Geography and Physics) by the Higher Education Funding Council for England.
- The University of Leicester has been awarded its first two National Teaching Fellowships
- The University of Leicester has been shortlisted for the award of "Higher Education Institution of the Year 2005" in the inaugural national competition organised by the Times Higher Education Supplement.

Whilst I have always maintained a high research profile and collaboration with industry, I fitted the Learning and Teaching role well: I had developed the Engineering Department's Learning and Teaching strategy over more than 10 years and I was a QAA assessor. I had also helped the University gain 14 consecutive departmental ratings of 'excellent' in QAA exercises (matched my only one other university). The student body at Leicester is unusually diverse: Leicester is the UK's largest provider of post-graduate distance-learning courses. A third of our students are from outside Europe. Extra consideration and support (for example through pre-sessional and in-sessional courses provided by the English Language Teaching Unit) is therefore required for the student body.

In this respect I chair a range of committees including:

- Academic Review Committee – responsible for monitoring quality procedures
- Learning and Teaching Committee – a strategic committee which has many responsibilities including:
  - Distance and E-Learning,
  - Marking and Grading Practices
  - Student Support and Guidance
  - Funds for new Teaching Initiatives
  - Teaching Enhancement Forum
  - Board of Lifelong Learning
  - Programme Approval Panels
  - University and National Teaching Fellowships
  - CETL Management
  - Leicester Award for Employability Skills
  - PPD – Personal and Professional Development
  - Educational Development and Support Centre

I chair the groups responsible for distributing Hardship funds (worth approximately £650k); policies have been drawn up this year to make this more routine and fair.

I believe in practising what I preach. In my first year as PVC I therefore implemented an Engineering module that I taught using “e-learning” in a Virtual Learning Environment. Because of the success of this, I recently received a Higher Education Academy Engineering Subject Centre Teaching Award.

## **Staff Development**

My PVC duties include Staff Development. Through discussions with the Registrar, we have moved the Academic Support from the Educational Development and Support Centre (EDSC) to Staff Development and allowed the EDSC to become more student-centred concentrating on personal development and employability. Through use of TQEF money, I have formed a Teaching Enhancement Forum to bolster academic support. The development of e-learning has also required my support at all levels of the university.

## **Information Technology and Communications**

I am also responsible for IT and Communications and chair the Information and Communication Strategy Committee. This year we are embarking, after considerable lobbying by me at all levels, on a “Managed Learning Environment” in which many of the university’s management and student databases and procedures will be unified and streamlined with appropriate access to all members of the university through a web-based portal. This project, which will cost approximately £5M has now started and will be completed in 3 – 4 years. I have introduced policies, which are now being implemented, for computer networking of the Halls of Residence and the wireless networking of the campus.

## **International Office**

I have been responsible for the International Office and have represented the university in celebrations and negotiations. In the summer of 2005, for example I have been in discussions with:

- Nara Women’s University, Japan
- Waseda University, Japan
- Republic Polytechnic, Singapore
- Xi’an Jiaotong University, China
- Beijing Institute of Technology, China
- Shanghai Jiaotong University, China

I have represented the university at Graduation Celebration Ceremonies for some of our distance learning students in Singapore and Hong Kong and have met alumni in Kuala Lumpur.

During my first year as PVC, I introduced and agreed with all departments, overseas admissions’ targets for the next 5 years.

## **Estates Development**

In 2002, the University of Leicester launched a £300M 30-year development plan. Included in this plan are a prestigious new Hall of Residence and the flagship building: the new library. As I wrote the original tenets of the university Student Accommodation strategy and

had led the “project implementation team” that was responsible for the successful refurbishment of the entire Chemistry Department Building, completed in 2003, I was asked to lead the teams for the design and construction of both the £20M “Villiers Hall” and the £30M library.

The two main challenges for Villiers Hall were that (i) planning permission had to be negotiated in a highly sensitive conservation area – this took over a year of discussions with the local council and residents – and (ii) an architectural landmark was desirable to attract conference business. The building is due for completion in the summer of 2006.

The design of the library has required considerable consultation at all levels of the university. The present library will be completed refurbished and doubled in size. The construction is particularly complicated as library facilities must be maintained at all times and construction must not interfere with other university services on what is a very restricted campus. In spite of this, I have been able to incorporate a 500-seat lecture theatre and large seminar rooms into a tight space and a tight budget. The building will be completed in the summer of 2007.

In order to help to fund the library by reducing tax liability, I set up a library company, “Leicester Academic Library Services” of which I am the Chairman of the Board.

## **Miscellaneous**

I chair the Music Advisory Committee. This oversees the (non-academic) Music Department which runs the largest concert programme of any university in the East Midlands.

I was partly responsible for the development of the Risk Management Policy.

I attend the “usual” Pro-Vice-Chancellor committees including: Senate, Council, Court, Finance and General Purpose Committee, Policy and Strategy Committee, Honorary Degrees Board, Staff Management Group, Senior Staff Promotions Advisory Panel, Academic Promotions Panel, Academic Related Promotions Panel, Administrative Computing Consultative Committee, Achievement Bonus Panels, AUT/University Officers meetings, Staffing Committee, Fixed Term Contract Committee, Early Retirement Committee, Governance Working Party, Capital Project Monitoring Group, and Vice-Chancellor’s Advisory Committee.

I have also been responsible for reviewing and restructuring the Department of Sociology and the School of Education (the latter is ongoing).

## **Teaching Experience**

### **Strategic Development of Teaching in Engineering**

I contributed considerably to the policy and strategy for learning, teaching and assessment in Engineering. I completely reviewed and rationalised the syllabus for Electrical and Electronic Engineering in the late 1980s. This included the introduction of microprocessor teaching and laboratories. About this time I also introduced much more formality to the way that 3<sup>rd</sup> year projects – a major part of an Engineering degree – were structured and assessed. I also developed completely new courses on Semiconductor Materials and Devices and on Optical Communication Systems. In 1992 I acquired £180,000 from the Department of Education and Science and the Department of Employment to start the first M.Sc. in Engineering. This has evolved and developed substantially and now attracts more than 50

overseas students. I was the first chair of the Department's Learning and Teaching Committee as well as being on the Faculty committee. I was primarily responsible for instituting the 1<sup>st</sup> and 2<sup>nd</sup> year teaching systems, which include tutorials, surgery hours, workshops and marked assignments. These led to the concept of an "independent learner" well before such concepts became widely understood through, for example, the University's Learning and Teaching strategy.

## **Areas of Teaching**

### **Undergraduate Courses**

- 1<sup>st</sup> year: Electrical laboratories, Professional And Industrial Aspects Of Engineering (PIAE), Design, Circuits And Systems, Electronics 1
- 2<sup>nd</sup> year: Electrical Engineering, Design, Microprocessors, Electronics 2, Semiconductor Materials and Devices
- 3<sup>rd</sup>/4<sup>th</sup> yr.: Electronics 3, Optical Communication Systems, Electrical Materials, projects

### **Postgraduate Taught Courses**

M.Sc.: Instrumentation Systems and Signal Processing, Digital Signal Processing, Microprocessors, Projects

### **Postgraduate Research**

I have been responsible for supervising about 15 PhD students and co-supervising as many again.

I am frequently an external examiner for PhD students and recently have examined many doctorates abroad, giving me further insights into the way that these are conducted. These have included:

- Head of Jury for PhD on: Estudio de los mecanismos de inyeccion de cargas en los materials aislantes por medio de medidas electrostaticas de caida y retorno de potencial. Nuevas herramientas de analisis, Universidad Politécnicna de Valencia, Dec 2001
- Head of jury for l'Habilitation, "Contribution a l'étude de la rigidité dielectrique des polyethylenes d'isolation des cables haute tension Université Paul Sabatier, Toulouse, France, November 2002
- Rapporteur for PhD thesis on « Vieillissement électrique et thermique d'une composite résine époxy-silice : étude des charges d'espace et de la conduction » CNRS-UJF (University of Grenoble), 2004
- Rapporteur for PhD thesis on « Etude de la charge d'espace et des phénomènes luminescents comme précurseurs du vieillissement électrique d'une résine époxy utilisée dans l'isolation haute tension » (Université Paul Sabatier, Toulosue), 2004

## **External Bodies**

I am a Governor of Bishop Grosseteste College – an HEI in Lincoln.

## Research and Associated Professional Activities

### Overview

All my research work has been to do with the dielectric properties of materials, that is, how materials respond to an electric field. The understanding gained in this area has enabled me to make significant contributions to the area of high voltage insulation. In particular, I have furthered the understanding of electrical breakdown, degradation and ageing processes and the methods used for assessing reliability of such insulating systems. I have developed techniques to measure "space charge" in dielectrics, including the fastest-ever system for inspecting transients. Space charge can cause high field regions that lead to premature breakdown but it can also be used as an indicator for the prognosis of insulator "health". With Keith Nelson, in pioneering work, we have characterised insulating materials filled with nano-particles.

Because of the wide applicability of dielectric theory, I have also enabled research through collaboration with groups in other areas. Examples include bio-chemical and biophysical sensing using optical fibre sensors, dust collection through the development of electrostatic precipitators and the stimulation of muscles to enable MS and stroke patients to walk.

I have approximately 150 publications; a selection is listed at the end of this CV. I have also attracted approximately £3 million in research grants, mainly on peer-reviewed EPSRC and EC projects and mostly as principal investigator.

My work as a postgraduate on the electrical properties of biological materials, stimulated by Nobel Laureate Albert Szent-Györgyi, formed the basis of my interests in:

- Polymers, which have a hierarchy of structures rather like proteins
- Dielectric relaxation and breakdown studies
- Biological systems and sensors

After my Ph.D., I was fortunate to join STL, a premier industrial laboratory with approximately 1000 workers. This was a stimulating environment where, for example, optical fibres were invented and much of the seminal work on liquid crystals and biosensors took place. This led to my continuing interest in electrical insulation for high voltage power transmission. My work spans the physics and chemistry associated with electrical breakdown, degradation and ageing, the electrical engineering associated with power distribution and transmission and the statistics associated with describing and analysing electrical breakdown voltages and times-to-failure.

In 1984, I moved to Leicester I was discouraged by the then Head of Department from pursuing high-voltage research and so I decided to follow my interest in biological systems and work on biological transducers and signal processing. Although this is not my primary research area, I am still associated with this work. My principal contributions in this area have been in optical sensing, the development of optical fibre sensors and functional electrical stimulation (FES). By applying dielectric principles to this area of sensing, I have been able to collaborate with hospital-based groups to produce sensors that have been used *in-vivo*. For example miniature sensors for measuring pressure in the upper airways have been successfully used in neonates for whom other sensors are too large. Other work has applied statistical analysis techniques to ECG (heart) signals to identify patients at risk from ventricular tachycardia. During this period I also co-authored a major research book on the Electrical Breakdown and Degradation of Polymers; this book has become a primary reference point and is still very widely referred to.

After a change of Head of Department, I re-started my experimental work on high-voltage insulation. This work has been in five principal areas: (i) treeing degradation, (ii) reliability studies, (iii) electrostatic precipitators for removing particles from gas streams (e.g. in power station chimneys), (iv) the role of space charge in electrical degradation and breakdown and (v) nanotechnology and dielectrics.

### **Working with Industry**

Much of this work has been in collaboration with industry although it has been primarily supported through SERC and EPSRC. The main industrial partners have been power generators and distributors (including National Grid, National Power, Electricité de France, TenneT bv in The Netherlands), cable companies (including BICC, Nexans in France, STC, Electrocabel in Belgium and Gestore della rete di trasmissione nazionale SpA and Pirelli in Italy), and manufacturers (including Deakins, Lodge Cotterel, Borealis in Sweden, and Schneider in Grenoble) and industrial research laboratories (including Centro Elettorecnico Sperimentale Italiano Giacinto in Milan, and Electrobél in Belgium).

Whilst I was Head of Research Group, we estimated that we working with 60 external companies, many of whom were overseas.

### **Professional Bodies, External Duties, etc.**

- |                |   |
|----------------|---|
| 1981 - 2004    | Member and Secretary of the Statistical Technical Committee of the IEEE Dielectrics and Electrical Insulation Society   |
| 1984 - 1996    | Member of the organising committee of 4 IEE International Conferences   |
| 1988 -1994     | Member and Chair of IEE Professional Group S2: <i>Materials, Science and Technology</i> and member of the Science, Education and Technology Board   |
| 1989 - 1990    | Chair: Leicester Bioengineering Society   |
| 1991 - present | Honorary General Secretary, later Honorary Treasurer of The Dielectrics Society. The Dielectrics Society is now incorporated into the Institute of Physics and I am a member of the “Dielectrics Group” in the IoP. I was responsible for running many of the conferences during the 1990s. |
| 1993           | Chair of the IEE International Conference on Partial Discharge  |
| 1994           | Member of the International Advisory Committee for the Conference on Dielectric and Related Phenomena   |
| 1995           | Guest Editor of IEE Proceedings, Science Education and Technology   |
| 1995           | Chair of the IEEE International Conference on Conduction and Breakdown in Solid Dielectrics   |
| 1995 - present | Chair of the IEEE ICSD International Advisory Committee   |
| 1997 - 2002    | Member of the Editorial Board of the Journal of Physics D (Applied Physics)   |
| 1997 - 2005    | Member of the Electrical Engineering College of EPSRC (recent Chairman of General Engineering prioritisation panel)   |
| 1997           | Member of the IEE Science, Education and Technology Board   |
| 1997 – present | Assessor for the Research Council of Norway   |

- 1999 - present Regional Editor for the IEEE DEIS “Electrical Insulation” magazine
- 2002 BA Working Group for Festival of Science
- 2002 – 2005 Appraiser for the Quality Assurance Agency (QAA)
- 2004 Guest Editor for special issue of the IEEE Transactions on Dielectrics and Electrical Insulation on “Dielectrics and Nanotechnology”
- 2004 Consultant to ABB Corporate Research
- 2005 I have been asked by Prof. Steve Williamson to conduct a “pre-RAE” review of his School of Electrical and Electronic Engineering at the University of Manchester (Prof Williamson is the Chair of the RAE Sub-Panel 24 for Electrical and Electronic Engineering)
- 2005 Award from the IEEE Standards Board for excellence in standards development (in recognition of leadership in developing IEEE Std 930-2004: IEEE Guide for the Statistical Analysis of Electrical Insulation Breakdown Data.
- 2006 Member of a CNRS panel scrutinizing proposals for laboratories at the Université Paul Sabatier, Toulouse

### **Invited Lectures**

- “What happens before breakdown?”* Invited talk to the 16th Annual Meeting of the Dielectrics Society: *The Physics of Dielectrics Solids*, Oxford, 1983
- Stochastic approach to breakdown and relaxation phenomena* Invited talk to Gordon Conference on Dielectric Phenomena, USA, 1984
- Recent trends in the understanding of electrical breakdown*, Invited talk to the 21st Annual Conference of the Dielectrics Society Meeting, Oxford, 1988
- Testing to breakdown - what does this tell us?*, IEE, London, 1991
- Progress in the understanding of water treeing*, University of Bologna, Italy, 1992
- Computer based techniques for the optimal extraction of medical data from graphical paper records*, IEE, London, 1992
- A critical review of water treeing mechanisms*, IEE, London, 1993
- A discharge-avalanche theory of the propagation of electrical trees*, University of New South Wales, Sydney, Australia, 1994
- Chaos in signal processing*, National University of Singapore, 1994
- Optical fibre sensors* Cardiology Department, NUS, 1994
- Recent advances in electrical degradation and breakdown in polymers*, Conference on Dielectric and Related Phenomena '94, Krakow Institute of Technology, Poland, 1994
- Prospects for clean coal technology*, IChemE, Nottingham, UK, 1994
- Statistical treatment of breakdown tests for extruded insulation*, IEE, London, 1995
- Optical fibre sensors*, IEE lecture, East Midlands, 1996

*Development of an intravascular fibre optic probe to measure retention of locally delivered drugs following coronary angioplasty*, IEE Colloquium, 1997

*Standard methods of failure analysis*, IEE Colloquium, London, 1998

*Space charge build up in solid insulation can lead to reduced breakdown strengths and times-to-failure*, Opening Inaugural Lecture, High-Voltage Workshop, Florida, USA, 1998

*Electrical breakdown and degradation measurements*, IEE Colloquium, London,

Rapporteur, Space Charge and Ageing of Dielectric Materials Symposium: Paris (organised by the Société du Vide), 1999

*Charges d'espace dans l'isolation*, Invited lectures to Université Paul Sabatier, Toulouse, July 2000

*Space charge in dielectrics: Old theories and new measurements*, Keynote opening address, IEE International Conference on Dielectric Materials, Measurements and Applications, Edinburgh, September 2000

*Bright Sparks*, Inaugural Lecture, University of Leicester, February 2001

*Field Effects in Dielectrics*, Invited lecture to the Dielectrics Society, Toulouse, April 2001

*Assessing the Ageing of Extruded Insulation in Transmission Cables*, Invited lecture to the EPRI Workshop on Aging of Extruded Insulation for Transmission Class Cables, Detroit, MI, USA, February 27 to March 1 2002

*Improving The Quality Of Life In Nerve Injured Subjects Using Functional Electrical Stimulation*, El-Saify, A.; Peasgood, W.; Fothergill, J.C.; Edwards, S.E. IEEE EMBSS Biomedical Engineering and Medical Physics Conference, Aston University, Birmingham, UK, 2 – 3 July 2002

*Cour de Formation sur le vieillissement des isolations électriques* (1 day course on the Ageing of Electric Insulation for Schneider Electric, Grenoble, France), 2003

*Nanocomposite Dielectrics: A Promising Future?* Invited lecture, Institute of Physics, Physics Congress, Heriot-Watt University, Edinburgh, 23-27 March 2003

A series of invited lectures were given at a workshop at the IEEE International Conference on Solid Dielectrics in Toulouse, July 2004. This was funded by the IEEE Dielectrics and Electrical Insulation Society. The lectures were on: "Charges & electrical insulation", "Electrical Breakdown", "The Stochastic Nature of Breakdown", "Electrical Degradation" and "Electrical Ageing", 2004

Course on *Breakdown, Degradation and Ageing of Insulation* for ABB, Switzerland, November 2004

*"Sub-Hertz" Dielectric Spectroscopy*, International Symposium on Electrical Insulating Materials, Kitakyushu, Japan, 2005

*Ageing: Does it Exist?* Invited lecture, Xi'an Jiaotong University, August 2005

## **Research Grants**

(Total = £2,982,668. The Principal Investigator is listed first in each case.)

Fothergill, J.C. and Smith, G.A.: SERC: Assessing the life expectancy of polymeric power cables (£63,571), 1/7/89-30/6/92

Fothergill, J.C.: SERC: Improving the reliability of polymeric power cables by increasing the time before the onset of water treeing (£61,446), 1/6/90-31/5/93

Jones, N.B., de Bono, D., and Fothergill, J.C.: SERC: Fibre-optic radiation probe and the study of vascular damage (£55,216) 1/10/90-30/9/93

Fothergill, J.C.: EPSRC/DTI(ETSU): Improving the design of discharge electrodes for electrostatic precipitators (£228,571), 1/4/93-31/3/96

Jones, N.B. & Fothergill, J.C.: EPSRC: Signal and information processing for monitoring and diagnosis: an application in the human neuromuscular systems (£104,462) 1/10/93-30/9/96

Fothergill, J.C. and Beynon, J.H.: National Grid: Use of composite materials for overhead line conductors (£14,186) 1/10/93-31/4/94

Fothergill, J.C.: National Grid: Optical Fibre Sensors (£12,500), 1/1/94 - 30/4/94

Hill, R.M. and Fothergill, J.C.: EPSRC: Experimental determination of the dynamics of space-charge development in insulators (£268,000 - with King's College London), - 1/10/94-30/9/97

Lefley, P.W. and Fothergill, J.C.: EPSRC: A controllable variable waveform high voltage power supply for electrostatic precipitators (VARIWAVE) (£135,235) 1/9/95-31/8/98

Fothergill, J.C.: National Grid: Optical fibre probes (£1250) Dec. 1995

Dissado, L.A. and Fothergill, J.C.: EPSRC: A study of the physical processes controlling the shape of electrical trees (£127,377) 1/5/96-30/4/99

Fothergill, J.C. and Hill, R.M.: EPSRC: Experimental determination of space charge dynamics in insulators under high voltage AC excitation (£155,552 – with King's College London) 1/5/98 – 30/4/00

Fothergill, J.C. and Dissado, L.A.: EU (Brite-Euram 3): Ageing and reliability, testing and monitoring of power cables, diagnosis for insulation systems (ARTEMIS), £170,000 1/9/98 - 31/12/01

Fothergill, J.C. and Dissado, L.A.: EPSRC: Electrical failure mechanisms in DC power capacitors (£208,213) 1/10/99 – 30/9/02

Fothergill, J.C. and Peasgood, W.: EPSRC: Electrical Stimulation Optimisation Using Feedback, (£63,327), 1/7/01 – 30/6/04

Fothergill, J.C. and Dissado, L.A.: Nanocomposite Materials for Dielectric Structures, EPSRC: £47,963, Jan – Jul 2002

Fothergill, J.C. *et al*, co-ordinator of the EU Framework 5 grant on “Benefits of HVDC Links in the European Power Electrical System and Improved HVDC Technology (HVDC)”, €1,694,434 = £1.16 million, 1/1/2003 - 30/6/2006

Fothergill, J.C. and Dissado, The Development of Nanocomposite Dielectric Structures, A joint proposal under the NSF/EPSC request for cooperative activities in materials research between US and European investigators, EPSRC contribution £85055 + €30,000 (=£20,500) from Schneider Electric, Jan 2004

## **Consultancy**

It is not possible to list all consultancy work. Work in the last five years includes:

2000                      Power Technology (Nottingham) regarding faulty cable sealing end

- 2000 Power Technology (Nottingham) regarding faulty cable
- 2001 *Dielectric Material Behaviour under High Voltage for ASTRA 1K Satellite Travelling Wave Tubes* La Société Européenne des Satellites, SES Contract Number TBM 04/2001, August 2001 (5 days)q
- 2003 *Cour de Formation sur le vieillissement des l'isolations électriques (Course on the Ageing of Electrical Insulation)* for Schneider Electric, Centre de Recherche, Grenoble, France, (3 days)
- 2004 Course for ABB, Switzerland on *Breakdown, Degradation and Ageing of Insulation*

## Publications

### Books

Dissado, L.A. and Fothergill, J.C.: *Electrical Degradation and Breakdown in Polymers*, Peter Peregrinus Ltd. for the IEE, 1992, ISBN 0 86341 196 7, 601pp

Fothergill, J.C. & Dissado, L.A. (eds.): *Space Charge in Solid Dielectrics*, The Dielectrics Society, ISBN: 0 9533538 0 X, 1998

### Book Chapter

J C Fothergill and R N Hampton, "Polymer Insulated Power Cable" in "Advances in High Voltage Systems" (M Haddad and D Warne (eds)), Publ: IEE, Chapter 10, pp. 495-528, 2004

### Engineering Standard

J. C. Fothergill and G. C. Montanari: Preparation of IEEE Standard P930-2004: *IEEE Guide for the Statistical Analysis of Electrical Insulation Breakdown Data*, recognised as an American National Standard (ANSI); Sponsor: Statistical Technical Committee of the IEEE Dielectrics and Electrical Insulation Society. Approved 29 March 2005 by the American National Standards Institute and Approved 23 September 2004 by IEEE-SA Standards Board. This standard is currently being considered for IEC status

### Principal Refereed Publications

#### **Short time interval decay measurement of space charge in epoxy resin**

S.Mitsumoto, M.Fu, L.A.Dissado, J.C.Fothergill  
IEEJ Trans. FM, Vol .126, No.4 , pp.260 - 261 (2006)

#### **The Influence of Physical and Chemical Linkage on the Properties of Nanocomposites**

Mihir Roy, J. Keith Nelson, Linda S. Schadler, Zou Chen, and John C. Fothergill  
Annual Report - Conference on Electrical Insulation and Dielectric Phenomena, CEIDP, 2005, p 183-186

#### **Space charge behaviour in epoxy laminates under high constant electric field**

Hole, S.; Dissado, L.A.; Ajour, M.N.; Fothergill, J.C;  
Journal of Physics D (Applied Physics), v 38, n 16, 21 Aug. 2005, p 2890-8

#### **"Mirror Image Effect" Space Charge Distribution in XLPE Power Cable under Opposite Stressing Voltage Polarity**

M. Fu, G. Chen, J. C. Fothergill  
Proceedings of the XIVth Int. Symp. On High Voltage Engineering, Tsinghua University, Beijing, China, August 25-29, 2005, Paper H-03

**The Influence of Residue on Space Charge Accumulation in Purposely Modified Thick Plaque XLPE Sample for DC Application**

M. Fu, G. Chen, J. C. Fothergill

Proceedings of the XIVth Int. Symp. On High Voltage Engineering, Tsinghua University, Beijing, China, August 25-29, 2005, Paper H-25

**Molecular Dynamics Simulation of the Hollandite  $\text{Na}_x(\text{Ti}_{8-x}\text{Cr}_x)\text{O}_{16}$ : Ion transport and high frequency dielectric absorption**

K L Khoo, L A Dissado, J C Fothergill, S Hussain and I Youngs

Proceedings of 2005 International Symposium on Electrical Insulating Materials, June 5-9, 2005, Kitakyushu, Japan, pp 21 – 24

**“Sub-Hertz” Dielectric Spectroscopy**

J. C. Fothergill, K. B. A. See, M. N. Ajour and L. A. Dissado

Proceedings of 2005 International Symposium on Electrical Insulating Materials, June 5-9, 2005, Kitakyushu, Japan, pp. 821-824 (Invited lecture)

**Application of thermoelectric aging models to polymeric insulation in cable geometry**

Cooper, E.S.; Dissado, L.A.; Fothergill, J.C.

IEEE Transactions on Dielectrics and Electrical Insulation, v 12, n 1, February, 2005, p 1-10

**Dielectric properties of epoxy nanocomposites containing  $\text{TiO}_2$ ,  $\text{Al}_2\text{O}_3$  and  $\text{ZnO}$  fillers**

Fothergill, John C.; Nelson, J.K.; Fu, M.

Annual Report - Conference on Electrical Insulation and Dielectric Phenomena, CEIDP, 2004, p 406-409

**Molecular dynamics simulation of high frequency ( $10^{10}$  to  $10^{12}$  Hz) dielectric absorption in the hollandite  $\text{Na}_x(\text{Ti}_{8-x}\text{Cr}_x)\text{O}_{16}$**

Kien Ling Khoo, Leonard A Dissado, John C Fothergill, Ian J Youngs

IEEE International Conference on Solid Dielectrics, Toulouse, France, July 5-9, 2004, pp550-553

**Molecular dynamics simulation of tunnel ion motions in the hollandite  $\text{Na}_x(\text{Ti}_{8-x}\text{Cr}_x)\text{O}_{16}$  under high electric fields**

Kien Ling Khoo, Leonard A Dissado, John C Fothergill, Ian J Youngs

Abstract, 3rd Int.Conf. on Broadband Dielectric Spectroscopy and its Applications, (Delft, 23-26 August), p250, 2004.

**Internal charge behaviour of nanocomposites**

Nelson, J.K. Fothergill, J.C.

Nanotechnology, volume 15, issue 5, (2004) p 586 - 595.

**Electrical, Microstructural, Physical and Chemical Characterization of HV XLPE Cable Peeling for an Electrical Aging Diagnostic Data Base**

Fothergill, J. C.; Montanari, G. C.; Stevens, G. C.; Laurent, C.; Teyssedre, G.; Dissado, L. A.; Nilsson, U. H.; and Platbrood, G.

IEEE Transactions on Dielectrics and Electrical Insulation, v 10, n 3, (June 2003), p 514-527

**Anomalous dielectric response of very small quantities of virgin, aged and failed silicone oil**

Haidar, A.; Fothergill, J. C.; Dissado, L. A.; Hopewell, P.

IEEE Transactions on Dielectrics and Electrical Insulation, v 10, n 2, (April 2003), p 336-342

**Dielectric spectroscopy of epoxy/glass composite materials**

Ajour, M. N.; Dissado, L. A.; Fothergill, J. C.; Norman, P. N.

Conference on Electrical Insulation and Dielectric Phenomena (CEIDP), Annual Report, (2002), p 438-441

**Application of polymer ageing models to power cables**

Cooper, E. S.; Fothergill, J. C.; Dissado, L. A.

Conference on Electrical Insulation and Dielectric Phenomena (CEIDP), Annual Report, (2002), p 392-395

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## **Hobbies and Relaxation**

I enjoy sailing, and also acting as a race officer at the Rutland Water Sailing Club.

I sing in the *University Singers* and an East Midlands Choir, *Cantamici*. I also play the piano and occasionally compose music.

15 October 2005