Dr Francis Pope PhD, MChem, MA(Cantab)

Lecturer
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About

Francis is a chemist with wide ranging interests in the atmospheric sciences. He applies a fundamental physicochemical approach to investigate atmospheric species and develops novel instrumentation to probe their processes.

In particular he is interested in: the assessment of geoengineering schemes, primary biological aerosols and their role in atmosphere-biosphere interactions, and multi-parameter processing and aging of aerosol.

Qualifications

2010 – MA (Cantab) – University of Cambridge

2005 – Ph.D. – University of Bristol

2001 – MChem (international) – University of Leeds

Biography

Francis studied chemistry for his undergraduate degree at the University of Leeds where he spent his third year at the Georgia Institute of Technology, Atlanta, USA. His doctoral studies were in atmospheric physical chemistry at the University of Bristol under the tutelage of Prof. Andrew Orr-Ewing and Prof. Mike Ashfold FRS. His thesis title was “Photolysis of formaldehyde relevant to the UTLS”. Upon graduation, he moved to the US to work in the lab of Dr Stanley Sander at NASA’s Jet Propulsion Laboratory in Pasadena. On return to the UK he took a position in the Department of Chemistry at the University of Cambridge and a college fellowship at Robinson College Cambridge. Here he worked with Dr Tony Cox, Dr Markus Kalberer and Prof. Rod Jones. He was appointed as a Birmingham Fellow and lecturer at the University of Birmingham in May 2012.

Postgraduate supervision

Miss Clare Fitzgerald (Department of Chemistry, University of Cambridge) Investigation into the phase and viscosity of atmospheric aerosol (lead supervisor Dr Markus Kalberer). **http://www.climatescience.cam.ac.uk/community/profile/cf355 (http://www.climatescience.cam.ac.uk/community/profile/cf355)**

Mr Uzoma Okwosha (GEES, University of Birmingham) Geoengineering and Solar Radiation Management (joint supervisor Dr Lee Chapman).

Francis is interested in supervising doctoral research students in the following areas:

- Assessment of geoengineering options
- Aerosol interactions between the atmosphere and biosphere
- Instrumentation and laboratory investigation of atmospheric chemistry

If you are interested in studying any of these subject areas please contact Francis on the details above.

For a full list of available Doctoral Research opportunities, please visit our **Doctoral Research programme listings (/schools/gees/courses/postgraduate/phd.aspx)** .

Research

Research interests

- Geoengineering and in particular the stratospheric injection of particles as a solar radiation management scheme
- Primary biological aerosols (PBA)
- Stratospheric ozone chemistry
- Fundamental physics and chemistry of aerosol particles
- Atmospheric gas phase photochemistry
- Development of novel laboratory techniques to study atmospheric phenomena

Other activities

Member of the following societies:

- Royal Society of Chemistry (RSC)

- European Geophysical Union (EGU)
- American Geophysical Union (AGU)
- Aerosol Society

Reviewer for the following journals:

- Environmental Science and Technology
- Atmospheric Science Letters
- Physical chemistry chemical physics
- Journal of Physical Chemistry A

Publications

21. Hosny, N., C. Fitzgerald, C. Tong, M. Kalberer, M.K. Kuimova, F.D. Pope. (2013) 'Fluorescent lifetime imaging of atmospheric aerosols: a direct probe of aerosol viscosity' Faraday Discussions, Accepted and ASAP manuscript. **http://dx.doi.org/10.1039/C3FD00041A (http://dx.doi.org/10.1039/C3FD00041A)**

20. von Hobe, M. et al. [86 authors including F.D. Pope] (2012) 'Reconciliation of essential process parameters for an enhanced predictability of Arctic stratospheric ozone loss and its climate interactions' Atmos. Chem. Phys. Discuss., 12, 30661-30754. **http://dx.doi.org/10.5194/acpd-12-30661-2012 (http://dx.doi.org/10.5194/acpd-12-30661-2012)**

19. Pope, F.D., P. Braesicke, R.G. Grainger, I.M. Watson, P. Davidson, R.A. Cox. (2012) 'Properties and impact of stratospheric aerosol particles proposed for solar radiation management.' Nature Climate Change, 2, 713. **http://dx.doi.org/10.1038/nclimate1528 (http://dx.doi.org/10.1038/nclimate1528)**

18. Griffiths, P.T., J.-S. Borlace, P.J. Gallimore, M. Kalberer, M. Herzog, F.D. Pope. (2012) 'Hygroscopic growth and cloud activation of pollen: a laboratory and modelling study' Atmospheric Science Letters. **http://dx.doi.org/10.1002/asl.397 (http://dx.doi.org/10.1002/asl.397)**

17. Lee J., V., Carrascon, P.J. Gallimore, A. Björkgren, D.R. Spring, F.D. Pope, M. Kalberer. (2012) 'The effect of humidity on the ozonolysis of unsaturated compounds in aerosol particles.' Phys. Chem. Chem. Phys. 14, 8023.
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16. Gallimore P.J., P. Achakulwisut, F.D. Pope, J. Davies, D.R. Spring, M. Kalberer. (2011) 'Importance of relative humidity in the oxidative ageing of organic aerosols: case study of the ozonolysis of maleic acid aerosol.' Atmos. Chem. Phys. 11, 12181.
http://dx.doi.org/10.5194/acp-11-12181-2011 (http://dx.doi.org/10.5194/acp-11-12181-2011)

15. Young I.A.K., C.M. Blaum, C. Murray, R.A. Cox, R.A.L. Jones, F.D. Pope. (2011) 'Structured visible absorption spectrum of molecular chlorine.' Phys. Chem. Chem. Phys. 13, 15318.
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14. Pope F.D. (2010) 'Pollen grains are efficient cloud condensation nuclei.' Environ. Res. Lett. 5, 004015.
http://dx.doi.org/10.1088/1748-9326/5/4/044015 (http://dx.doi.org/10.1088/1748-9326/5/4/044015)

13. Pope F.D., P.J. Gallimore, S.J. Fuller, M. Kalberer. (2010) 'Ozonolysis of maleic acid aerosols: Initial results on aerosol hygroscopicity and volatility.' Environ. Sci. Technol. 44, 6656.
http://dx.doi.org/10.1021/es1008278 (http://dx.doi.org/10.1021/es1008278)

12. Pope F.D., B.J. Dennis-Smither, P.T. Griffiths, S.L. Clegg, R.A. Cox. (2010) 'Laboratory and modelling studies of aerosols comprised of malonic acid, glutaric acid, and their mixtures with sodium chloride: Part II volatility.' J. Phys. Chem. A. 114, 10156.
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11. Pope F.D., B.J. Dennis-Smither, P.T. Griffiths, S.L. Clegg, R.A. Cox. (2010) 'Laboratory and modelling studies of aerosols comprised of malonic acid, glutaric acid, and their mixtures with sodium chloride: Part I hygroscopic growth.' J. Phys. Chem. A. 114, 5335.
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10. Pradhan M., M. Kalberer, P.T. Griffiths, C.F. Braban, F.D. Pope, R.A. Cox, R.M. Lambert. (2010) 'Uptake of gaseous hydrogen peroxide by submicron titanium dioxide aerosol as a function of relative humidity.' Environ. Sci. Technol. 44, 1360.
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9. Pope F.D., L. Harper, B.J. Dennis-Smither, P.T. Griffiths, S.L. Clegg, R.A. Cox. (2010) 'Laboratory and modelling studies on the hygroscopic properties of two humic acid aerosols.' J. Aerosol Sci. 41, 457.
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7. Pope F.D., K.D. Bayes, J.C. Hansen, R.R. Friedl, R. Salawitch, S.P. Sander. (2007) 'UV absorption cross sections of the chlorine monoxide dimer (ClOOCl).' J. Phys. Chem. A. 111, 4322.
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6. Smith C.A., F.D. Pope, B. Cronin, C.B. Parkes and A.J. Orr-Ewing. (2006) 'High-resolution absorption cross sections of formaldehyde at wavelengths from 300 to 340 nm at 294 and 245 K.' J. Phys. Chem. A. 110, 11645.
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5. Nicovich J.M., S. Parathasarathy, F.D. Pope, A.T. Pegus, M.L. Mckee and P.H. Wine. (2006) 'Kinetics, mechanism, and thermochemistry of the gas phase reaction of atomic chlorine with dimethyl sulfoxide.' J. Phys. Chem. A. 110, 6874.
http://dx.doi.org/10.1021/jp0567467 (http://dx.doi.org/10.1021/jp0567467)

4. Pope F.D., C.A. Smith, P.R. Davis, D.E. Shallcross, M.N.R. Ashfold and A.J. Orr-Ewing. (2005) 'Photochemistry of formaldehyde under tropospheric conditions.' Faraday Discuss. Chem. Soc. 130, 59.
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3. Pope F.D., C.A. Smith, M.N.R. Ashfold, A.J. Orr-Ewing (2005) 'High-resolution absorption cross sections of formaldehyde at wavelengths from 313 to 320 nm.' Phys. Chem. Chem. Phys. 7, 79.
http://dx.doi.org/10.1039/B414183K (http://dx.doi.org/10.1039/B414183K)

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