# BRIEF CV OF ANDREW J YULE

*Visiting Professor* Spray Research Group, University of Salford
*Emeritus Professor of* Mechanical Engineering, Univ Manchester (UMIST).
*Director*, Perdac Ltd, Manchester; *Director*, CPFResearch Ltd, nr Sheffield.

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| **Previous Positions:** | Professor of Mechanical Engineering at UMIST (to 2004)<br>Staff at Warwick (1970, MHD), Southampton (1972, turbulence) and Sheffield (1974, sprays and combustion) Universities |
| **Qualifications:** | BSc(Hon) Aeronautical Eng. Univ. of Manchester<br>PhD: Fluid Mech. (Turbulent Mixing) Univ. of Manchester (1969)<br>DSc: (Sprays and Turbulent Flow) Univ. Manchester (1993) |
| **Learned Societies:** | FRAeS (Fellow of the Royal Aeronautical Society) |

**BACKGROUND**
Founder of the Atomization and Sprays Research Group at UMIST; 1990-2004, which typically employed 10 research and technical staff. Postgrad students, supervised and graduating include 21 PhD, 5 MPhil, 4 MSc (Research) and 22 MSc (E&D) students. Responsible for research income £350K(+) per annum.

*External PhD/MPhil examiner* at the following Universities: Imperial College, UCL, Kings College London, Sheffield, Durham, University College Dublin, University of Wales, Leeds, Nottingham, Brunel, Loughborough, Hong Kong and Zaragoza (all in topics related to Sprays and Atomization).

*Mid Career Training (Industrial Short Courses):* organised and presented (cooperating with Perdac Ltd): more than 20 Spray Science and Technology courses, 4 Advanced Measurement Techniques for Fluid Flows courses, 8 Atomization of Metals courses.

*Recognised internationally* in the spray research field, edited major conference proceedings (ICLASS-85, ILASS-Europe'98, ICLASS-94), on journal editorial boards (Atomization and Sprays, International Journal of Heat and Fluid Flow), and presented invited plenary papers and chaired sessions in many international conferences.

*Authored or Co-authored* over 200 publications in the areas of turbulent flows, sprays, atomizer design, two phase flows, measurement techniques (*see separate list of publications)*, and 10 *Patents* on atomizer design, including medical inhalers, ultrasonic atomizers and consumer aerosols. Co-authored OUP book "Atomization of Melts", 1994, and Springer Verlag book "Industrial Sprays", 2002.

*Past and present consultant* for Ministry of Defence, and Health & Safety Executive, and for many pharmaceutical companies, oil companies and other major companies involved in fluid mechanics, sprays and aerosols including GSK, Sanofi Aventis, BP Chemicals, BP Research, Exxon UK/INFINEUM, Akzo Nobel/ICI Paints, Procter and Gamble, Reckitt Benckiser, Rolls Royce Aero Engines, Unilever, Boston Scientific.

*Expert Witness* with experience in cases involving sprays, aerosols and heat and fluid flow.

*Recent and current fundamental research* on break-up of liquid sheets and liquid jets, internal flow in atomizers and spray cooling via EPSRC (UK Government) grants and industrial funding.

*Recent and current industrially supported research* (including STI-LINK, and EU FP5 supported research) in the areas of compressed gas use and pressure-swirl nozzle designs for VOC reduction in aerosol cans, and various spray combustion, water spray and electrostatic spray problems, diesel injection, flammability hazard determination, spray drying optimisation, polymer powder production by ultrasonic atomisation, and spray coating in food processing.

*Past research* on turbulence structure, turbulent jets, closure schemes for CFD models and application of CFD codes.

*Confidential experimental and computational research* in fields of MDI devices, nebulizers, powder inhalers, domestic aerosol can spray nozzles, ultrasonic (vibrational) atomisation, paint spraying

*Major contributions* include: instrumentation developments including, tomographic transformation of scattered light data for particle sizing, processing of Malvern instruments-type data for dense sprays, deconvolution of signal pulse height data to correct for light distribution in measurement volume for LDA/PDA particle sizing; techniques, conductivity probes, for investigation of dense sprays; diagnosis of break-up zone structure in diesel sprays; investigations of coherent structures in turbulence; development of new EU flammability test standard for hydraulic fluids; development of new atomization technique for MDI inhalers (patented with Glaxo); measurement and prediction of the internal flows of swirl atomizers; new nozzle insert and valve designs for reducing VOC content in consumer aerosols, improved understanding and designs for ultrasonic atomizers, improved coating method for foodstuffs, improved industrial shower designs

**UNIVERSITY TEACHING EXPERIENCE:**
Professor Yule taught at UMIST 1981 – 2004, including:
In charge of Fluid Mechanics modules for Aero and Mech Engineering BEng, MEng (3rd and 4th Year), and MSc (Thermal Power and Fluids Engineering) courses.
Instrumentation and Measurement (3rd Year). Course leader (1994-2002) for Engineering Design module for BEng, Mechanical Engineering (3rd Year).
Experimental Methods for MSc course Thermal Power and Fluids Engineering: designed and successfully ran an e-learning version of module in 2002 and 2003.
Thermodynamics (2nd year), Fuid Mechanics (2nd Year Civil Engineering) and Design (2nd year).

**UNIVERSITY ADMINISTRATION EXPERIENCE:**
Director of UMIST Aerospace Engineering BEng/MEng Course, 2000-2003.
Director of Joint UMIST-Univ Manchester Aerospace Engineering Course 2000-2003
Member of UMIST Council.
Member of UMIST Doctor of Engineering Committee (2000–2004).
Joint Head of Thermofluids Division, 2000-2003.
Final Year Mechanical Engineering Student Projects Panel Chairman 1997-2003.
Departmental Examinations Officer, 1993-1997.
Responsible for planning and gaining approval for a new MSc Course, Thermal Power and Fluids Engineering, and Course Admissions Officer, Tutor and Examinations Officer, 1986 to 1991.
Year tutor for final year of BEng Course in Mechanical Engineering, 1992 to 1993.