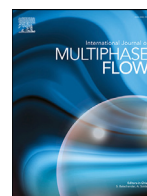




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## Remembering Geoff Hewitt



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Geoff Hewitt, a towering figure in multiphase flows, is sadly no longer with us. When the news of his passing began to filter through, I was inundated by tributes to Geoff from all around the world by email, post, and social media from colleagues, friends, past PhD students and postdocs, and undergrads who had been taught by him. They all described their sense of loss, and how they'd been touched by a man they regarded as being truly one-of-a-kind.

For as long as we've known him, Geoff has epitomised excellence, with the kind of glittering career reserved to a select few. He has made many significant contributions to engineering research and practice over a period of nearly sixty years; indeed, very few can match Geoff's contributions in advancing the theory and practice of multiphase flows.

Geoff spent the first half of his career at the Harwell laboratory of UKAEA and was a Division Head. While there, he published over 100 reports/conference papers and over 50 papers in the international literature. He also wrote four books. The emphasis in all this work has been on the development of the theory of multiphase flows and heat transfer guided by careful experimental observation in an area where intuition is all too likely to be fallible. He has had a wide experience of industrial applications through his founding of the Heat Transfer and Fluid Flow Service at Harwell and through his extensive work with industry.

Geoff then spent the second half of his career as Professor of Chemical Engineering at Imperial College London and brought his considerable experience to revive the whole area of multiphase flow there. He has built experimental rigs that are world-leading in their ability to handle high-pressure flows. These rigs are by their nature large; this is because many multiphase flow phenomena are scale-dependent: a small rig can miss essential physics. The size of the rigs means that they are expensive and another part of his success has been the way Geoff has raised funds to build and run them.

While at Imperial, Geoff has published over 100 reports/conference papers and over 110 papers in the international literature and also co-authored one book. He has supervised over 50 PhD students, all of whom he has always supervised himself and most of whom have gone on to careers in industry, normally in the area of multiphase flow. Geoff has also managed many major, very successful initiatives. One major initiative is the Transient Multiphase Flow project (1996 – present), with significant collaborations from co-workers at other universities, namely Bristol, Cambridge, Cranfield, and Nottingham, and support from the oil and gas industry as well as the Research Councils, UK. Another initiative is the very successful multi-university project on fouling in crude oil pre-heat trains in refineries, the effects of which cost the US alone more than \$2B pa. Other projects include those on distillation, multiphase mass flow metering (of vital interest for fiscal/tax purposes), and a variety of novel small nuclear reactors (where large is by no means necessarily beautiful).

Geoff's success is down to his incredible drive, burning ambition, infectious work ethic, unbounded enthusiasm, incredible memory, (incredible filing system!), and natural leadership skills. Geoff was an outstanding public speaker, knowledgeable, deeply insightful, and incredibly convincing. He has left an indelible mark wherever he went, with the kind of lasting impact on academia, industry, engineering practice, and, most importantly, people, that only Geoff could create.

Professor Giota Angeli of UCL, a former PhD student of Geoff's, recalls fondly how almost every "have you tried this?" from Geoff resulted in a far-from-straightforward, yet incredibly insightful, experiment. Professor Jader Barbosa of the Federal University of Santa Catarina, Brazil, who completed his thesis under Geoff's supervision said "Geoff Hewitt was my role model, my guiding star. I will never forget when, as a first-year PhD student, I first showed him my calculations on droplet concentration imbalance and how it explained the anomalous behaviour of the heat transfer coefficient in annular flow of mixtures. His enthusiastic reply ("There is nothing like it, Jader!") synthesised the passion for science and the pleasure of discovery that I strive to pass on to my students every

day.” Professor Prashant Valluri of the University of Edinburgh, and another former student of Geoff’s, reminds us that “[Geoff] was indeed larger-than-life and always open to crazy modelling ideas (like mine) to solve immensely challenging multiphase flow problems... Though officially retired and Emeritus since 1999 (I joined his group in 2000), he used to say this when asked about his retirement “I need to channel my so-called success to my team and my students. I will only leave my office with my feet up.””

Geoff’s long-time collaborator, Professor Chris Lawrence, formerly of Imperial College London and presently at Schlumberger, said “I had the privilege to work closely with Geoff Hewitt for many years, and benefitted hugely from his enthusiasm, generosity, and good humour. ‘The Geoff’ was uniquely talented in many ways, with creative insight, a prodigious memory, and an insatiable appetite for research; he fully deserves the definite article awarded to him by one of our students.”

Professor Neima Brauner of Tel Aviv University, a friend and colleague of Geoff’s said “We have lost a dear friend, whose scholarly work and personality enriched our lives for several decades. For us, Geoff has been a model of a top scientist, a great educator, and a gentleman. We have always enjoyed meeting him, and exchanging views on science, culture, and political issues with him. His charm and warm personality illuminated our interactions. Geoff was a mentor, friend, brilliant scholar, and world-renowned expert in multiphase flows and transport phenomena, amongst others. His impact on us, and on the younger scientists at TAU, will be long lasting.”

Professor Masahiro Kawaji of the City College of New York, a collaborator and co-author of Geoff’s remarks that “Prof. Geoff Hewitt was undoubtedly one of the most respected experts on gas-liquid two-phase flow, having published extensively on many two-phase flow topics, focusing on fundamental physical mechanisms. Two monographs, Annular Two-Phase Flow and Measurement of

Two Phase Flow Parameters are well-known and highly useful for students, researchers and practicing engineers. Through these and other publications including the well-known Heat Exchanger Design Handbook, Professor Hewitt has made lasting contributions to the field of two-phase flow and heat transfer.”

For all his work, Geoff has been recognised by his election to the Fellowship of the Royal Academy of Engineering: he was a founding Fellow and later served as a member of its Council and of its Leverhulme Fellowships Committee. He has been elected to Fellowship of the Royal Society, and the US National Academy of Engineering. He has also been elected as a Fellow of the Institution of Chemical Engineers (IChemE) and was its President in 1989-90. Geoff has also won numerous prestigious international medals and awards: Donald Q. Kern Award (American Institute of Chemical Engineers), Max Jakob Memorial Award (American Society of Mechanical Engineers/American Institute of Chemical Engineers), the Luikov Medal, the Nusselt-Reynolds Prize, and the Senior Multiphase Flow Award at the International Conference on Multiphase Flows in 2007. He was also awarded a Global Energy International Prize in 2007. Geoff’s most recent award was in 2017: the Sharma Medal from the IChemE.

For me personally, Geoff was a great friend, and a terrific source of advice, humour, kindness, and support. It has been an honour and a privilege for me to have known him, and to have worked with him. As the late Barry Azzopardi used to say, Geoff was like a great battleship, sailing magnificently through the waters, and entraining us all in his bow waves. This is such an accurate description of Geoff the man, the scientist, and the visionary: always in relentless pursuit of knowledge, but doing it with style, charisma, and a smile none of us will ever forget.

Omar K. Matar  
Panagiota Angeli  
Masahiro Kawaji