David C. Joy
1943 - 2022

Please see Dale Newbury’s excellent account (Newbury, 2022) of David’s life in the UK and US, when they worked together. This poster is mainly based on Dale’s appreciation.

Born in England, David’s first degree was an MA (first-class honors) in 1966 in Natural Sciences at Tripos, Trinity College, Cambridge, UK. He was a graduate student under John Jakubovics on contrast of magnetic domains by SEM.

He received his PhD in the Department of Materials and Materials Science at Oxford, UK. Studies on the investigation of Properties of Magnetic Materials by Scanning Electron Microscopy.

He was then selected by Peter Hirsch, Chair of Metallurgy at Oxford, to a Postdoc Research Fellowship at Leeds College, Oxford.

Fig. 1. In the back lab, they got one of the first commercial SEMs, a Hitachi model 3 or 4, which excited David’s main interest in SEM.

Fig. 2. From Newbury’s report, he worked with VG to design and build the first FE-STEM outside the USA. Shown is an early VG501 STEM.

Monte-Carlo calculations

Starting in 1979 he worked with Dale Newbury (also from Oxford) at the (US) National Bureau of Standards. He made electron-matter interactions visible using Monte-Carlo calculations on a PC (instead of on a main frame). This was reflected in many publications and books over his long career.

Fig. 3. Famous textbooks for Lehigh courses

ORNL

In 1987 he was appointed Distinguished Scientist at Oak Ridge National Laboratory (ORNL). While there, he became high-resolution SEM, a Lake Tsukinomiya and Hedinian SEM, working with Zome II (Fig. 4).

Starting in 2005, he was responsible for the EM Facility at Center for Nano materials at ORNL.

He published on aberration-corrected SEM, low-energy SEM, Electron diffraction, inverse and imaging. Monte-Carlo electron beam interaction calculations, blockface FIB tomography, Helium ion imaging and microanalysis, etc.

He played church organ and was a devotee of Gilbert and Sullivan, but with wide-ranging musical interests. As with most of the pioneers in microscopy, he was interested in radio at a young age, and he held the amateur radio callsign AC4FN. He had an interest in CW (Morse code).

There are hundreds of entries in David’s bibliography, so only the acknowledgements that led to this poster are listed:


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Fig. 4. He contributed several additional books and had 9 patents.

Honors

- Fellow of RMS, MAS, and MSA
- 1996 Semiconductor Research Consortium Researcher of the year
- 2010 MAS Duncumb Medal (MAS)
- 1982 MAS President
- 1999 MSA President
- 1989 Irish President