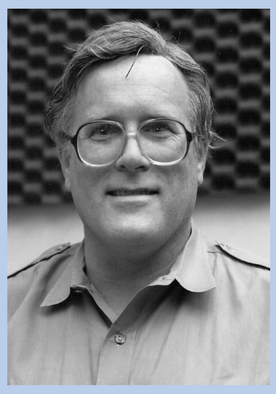


# David C. Joy
## 1943 - 2022

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 mostly 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.

### SEM Interest

He received his PhD in the Department of Metallurgy and Materials Science at Oxford. His thesis was "Investigation of Properties of Magnetic Materials by Scanning Electron Microscopy".

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

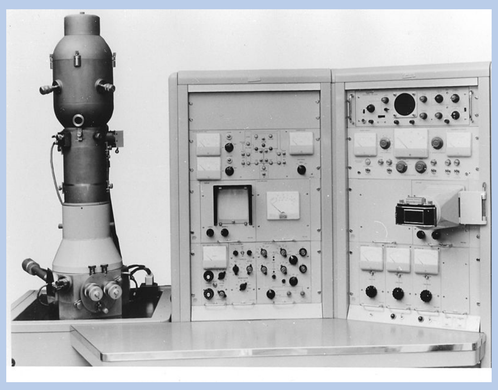


Fig. 1. In the Hirsch lab, they got one of the first commercial SEMs, a Stereoscan model 3 or 4, which incited David's main nterest in SEM.

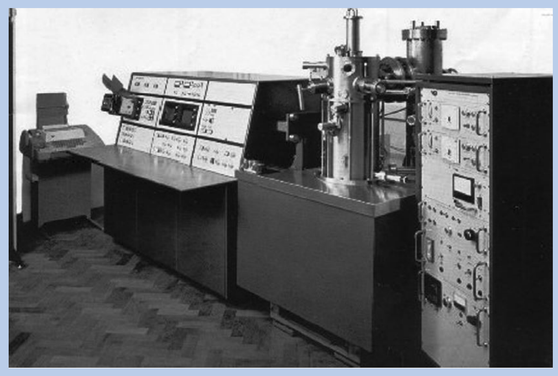


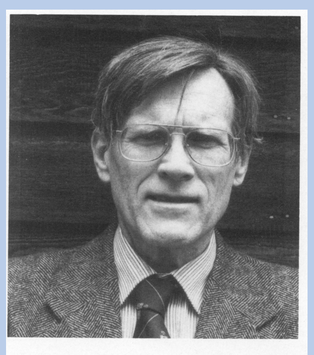
Fig. 2. From Newbury's report, he worked with VG to design and build the first FE-STEM outside the USA..
Shown is an early VG501 STEM.

### Monte-Carlo calculations

Starting in 1978 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.


### MSA/MAS and Lehigh course Activities

In 1980 he was MSA Program Chair. The M&M meeting was supposed to be in San Francisco. At the last moment, it had to be moved to Reno. It was managed without missing a beat, although he found it exciting. At MSA, he was also proud to be Chair of Publications committee. For years, he contributed to the textbook and the Lehigh courses, recruited by Joe Goldstein. He also presented MSA short courses, among many other lectures.



DAVID JOY
MSA PRESIDENT


Fig. 3. Famous textbooks for Lehigh courses

### ORNL

In 1987 he was appointed Distinguished Scientist at Oak Ridge National Laboratory (ORNL). While there, his interest was high-resolution SEM, in which he was long associated with Hitachi. Later his interest was helium-ion SEM, working with Zeiss 9 (Fig. 4).

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

He published on aberration-corrected SEM, Low-energy SEM, E-beam lithography, ion beam fabrication, analysis and imaging. Monte-Carlo electron-beam interaction calculations, blockface FIB-tomography, Helium-ion imaging and microanalysis, etc., 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).

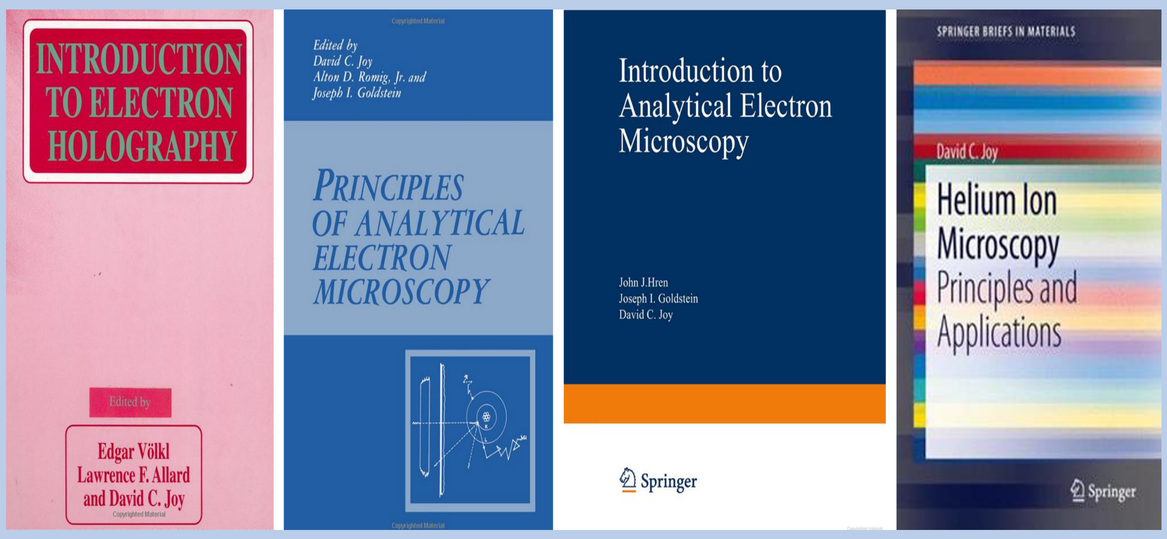



Fig. 4. He contributed several additional books and had 9 patents.

### Honors

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

### Acknowledgements

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

Newbury, D.E. (2022) A Remembrance of David C. Joy, a True Microscopy and Microanalysis Pioneer.
(Left-hand picture at top)

Newberry, S. P. (1990) Video Interview of David Joy, Available from the MSA Archivist.
(Right-hand picture at top).