

David James Silvester

Birthplace: Dumfries, Scotland

Date of Birth: 26-12-58

Academic Qualifications

Ysgol Ardudwy, Harlech, Gwynedd.

1971-1977 : Five A-levels (All Grade A) : Eleven O-Levels.

University of Manchester Institute of Science and Technology (UMIST).

1977-1980 : B.Sc Mathematics, First Class Honours.

1980-1983 : Ph.D Numerical Analysis.

Professional Affiliations

Member of the Society for Industrial and Applied Mathematics (SIAM) (1991-present).

Secretary & Treasurer of the UK and Republic of Ireland SIAM section (1998-2000).

President of the UK and Republic of Ireland SIAM section (2009-2011).

Member of the EPSRC Peer Review College (2000-present).

Member of the Institute for Mathematics and Applications (IMA) (2010-present).

Employment

January 1984 – August 1984 : Higher Scientific Officer,
United Kingdom Atomic Energy Authority,
AERE Harwell, Oxfordshire, United Kingdom.

September 1984 – September 2003 : Lecturer/Senior Lecturer/Reader,
Mathematics Department, UMIST, United Kingdom

October 2003 – Present : Professor of Numerical Analysis,
UMIST → University of Manchester, United Kingdom

International Appointments

January 1991 – September 1991 : Visiting Assistant Professor,
Computer Science Department, Stanford University, USA.

March 1994 – June 1994 : Visiting Research Fellow,
Computer Science Department, University of Maryland, College Park, USA.

March 1999 – June 1999 : Visiting Associate Professor,
Computer Science Department, Stanford University, USA.

July 2009 – August 2009 : Visiting Professor,
Université du Littoral – Côte d'Opale, France

October 2019 – November 2019 : Romberg Visiting Professor,
University of Heidelberg, Germany

Awards

January 1991 – September 1991 : Fulbright (Senior) Fellowship.

Publications in the last five years

- Khan, A., Bespalov, A., Powell, C. and Silvester, D. Robust a posteriori error estimators for stochastic Galerkin formulations of parameter-dependent linear elasticity equations, *Mathematics of Computation*, **90**, 613–636, 2021. <https://doi.org/10.1090/mcom/3572>
- Lang, J., Scheichl, R. and Silvester, D. A fully adaptive multilevel collocation strategy for solving elliptic PDEs with random data, *J. Computational Physics*, **419**, 109692, 2020. <https://doi.org/10.1016/j.jcp.2020.109692>
- Bespalov, A., Rocchi, L. and Silvester, D. T-IFISS: a toolbox for adaptive FEM computation, *Computers and Mathematics with Applications*, **81**, 373–390 2021. <https://doi.org/10.1016/j.camwa.2020.03.005>
- Pranjali and Silvester, D. Balanced iterative solvers for linear nonsymmetric systems and nonlinear systems with PDE origins: efficient black-box stopping criteria, *J. Scientific Computing*, **81**, 271–290, 2019. <https://doi.org/10.1007/s10915-019-01018-w>
- Khan, A., Powell, C. and Silvester, D. Robust a posteriori error estimators for mixed approximation of nearly incompressible elasticity, *International Journal for Numerical Methods in Engineering*, 1–20, 2019. <https://doi.org/10.1002/nme.6040>
- Khan, A., Powell, C. and Silvester, D. Robust preconditioning for stochastic Galerkin formulations of parameter-dependent nearly incompressible linear elasticity equations, *SIAM J. Scientific Computing*, **41**, A402–A421, 2019. <https://doi.org/10.1137/18M117385X>
- Elman, H and Silvester, D. Collocation methods for exploring perturbations in linear stability analysis, *SIAM J. Scientific Computing*, **40**, A2667–A2693, 2018. <https://doi.org/10.1137/17M1117689>
- Pearson, J., Pestana, J. and Silvester, D. Refined saddle-point preconditioners for discretized Stokes problems, *Numerische Mathematik*, **138**, 331–363, 2018. <https://doi.org/10.1007/s00211-017-0908-4>
- Powell, C., Silvester, D. and Simoncini, V. An efficient reduced basis solver for stochastic Galerkin matrix equations, *SIAM J. Scientific Computing*, **39**, A141–A163, 2017. <https://doi.org/10.1137/15M1032399>
- Bespalov, A. and Silvester, D. Efficient adaptive stochastic Galerkin methods for parametric operator equations, *SIAM J. Scientific Computing*, **38**, A2118–A2140, 2016. <https://doi.org/10.1137/15M1027048>
- Silvester, D. and Pranjali. An optimal solver for linear systems arising from stochastic FEM approximation of diffusion equations with random coefficients, *SIAM/ASA J. Uncertainty Quantification*, **4**, 298–311, 2016. <https://doi.org/10.1137/15M1017740>
- I have over 6200 citations on Google Scholar, see <http://scholar.google.co.uk/citations?user=-7jBp94AAAAAJ>. My Google Scholar h-index is 32.
- I have 62 publications indexed by MathSciNet in the MR Citation Database, see <http://www.ams.org/mathscinet/search/author.html?mrauthid=249706>. These have been cited 2200 times by over 1500 authors.

Research highlights

- I have been awarded 22 research grants over my academic career (including 13 EPSRC grants) see <https://gow.epsrc.ukri.org/NGB0ViewPerson.aspx?PersonId=14415>.
- I am currently the lead PI of a significant (£700K) responsive mode grant on “Numerical Analysis of Adaptive UQ Algorithms for PDEs with Random Inputs”, funded by EPSRC in December 2016 (£381,000 for Manchester, £329,000 for Birmingham).
- The **second edition** of my research monograph on Finite Elements and Fast Iterative Solvers: with applications in incompressible fluid dynamics was published in June 2014. Over 1500 copies have been sold to date.
- ★ I have supervised **thirteen** PhD students to a successful thesis submission including two students from Africa and one from Indonesia. My academic ancestry is recorded on the Mathematics Genealogy Project, see <http://genealogy.math.ndsu.nodak.edu/id.php?id=197169>

Teaching highlights

- I have a sustained record of excellence in teaching at all levels — I have taught **seventeen** different courses during my academic career at Manchester and have written **ten** of these from scratch. “I feel very lucky for having a teacher like him ... he is very professional and very responsible.” (Sample UQ response, January 2018)
- The latest version of my open-source software IFISS was released in February 2019. The toolbox is used to support teaching and learning in universities around the world.
- My **textbook** on partial differential equations (368 pages) was published in October 2015. “The writing is lively, the authors make appealing use of computational examples and visualization, and they are very successful at conveying and integrating physical intuition. This is probably the best introductory book on PDEs that I have seen in some time. It is well worth a look.” (William J. Satzer, MAA Reviews, maa.org, April, 2016)
- ★ I am currently writing a suite of 50 video tutorials on modelling incompressible flow <https://personalpages.manchester.ac.uk/staff/david.silvester/videlectures.html>
These are currently being viewed by researchers in a number of universities around the world.

Service and Leadership

- I am a conscientious **reviewer**: I have refereed papers for thirteen different journals within the last five years; see <https://publons.com/author/1350485/>.
- I was **chair** of an international panel that evaluated 74 mathematics proposals for the Portuguese Research Funding Council (FCT) at a meeting in Lisbon held in 2017.
- I have been a member of the EPSRC Peer Review College since its inception in 2000. I have been invited to sit on nine EPSRC panels to date and I chaired the Mathematical Sciences responsive mode panel held in February 2019.
- I was a member of an external panel which evaluated the continuation of funding for the Oberwolfach Research Institute for Mathematics (MFO) in Germany in May 2016.
- I am a member of the international programme committee of a biennial conference series on “Iterative Methods in Scientific Computing”. The next meeting is likely to be held in Copper Mountain in Colorado in 2021.