PROFESSOR STEFAN GÜTTEL

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— Short CV as of December 2023 —

A. Personal information

▶ Professional experience

2023–2027	Royal Society Industry Fellow at the Arup Group (50% time)
2021–	Professor of Applied Mathematics at the University of Manchester
2012–2021	Lecturer (2012), Senior Lecturer (2016), Reader (2018) at U Manchester
2011–2012	Postdoc at the University of Oxford, UK
2010–2011	Postdoc at the University of Geneva, Switzerland

▶ Education

2010	Ph.D. in Applied Mathematics (Dr. rer. nat., *summa cum laude*)
2008	Research exchange at the National Institute of Informatics, Japan
2006–2010	Ph.D. candidate at TU Bergakademie Freiberg, Germany, Supervisor: Prof. Michael Eiermann
2006	Diplom in Applied Mathematics (Dipl.-Math., best possible grade 1.0)
2005–2006	Erasmus student at the University of Cyprus, Cyprus
2001–2006	Undergraduate studies at TU Bergakademie Freiberg, Germany

B. Research contributions and recognitions

▶ Publications in peer-reviewed journals (last 5 years)

Scimago quartile (Q), Impact Factor (IF), and Google Scholar (GS) citations appended to each entry. A complete publication list is available on my website. Total GS citations: 2,500. H-index: 26.

[1] S. GÜTTEL AND M. SCHWEITZER. Randomized sketching for Krylov approximations of large-scale matrix functions, *SIAM J. Matrix Analysis and Applications,* 44:1073–1095 (Q1, IF: 1.9, GS: 9)

[2] X. CHEN AND S. GÜTTEL. An efficient aggregation method for the symbolic representation of temporal data, *ACM Trans. Knowledge Discovery from Data*, 17:1–22, 2023. (Q1, IF: 2.7, GS: 4)

[3] G. M. NEGRI PORZIO, S. GÜTTEL AND F. TISSEUR. Robust rational approximations of nonlinear eigenvalue problems, *SIAM Journal on Scientific Computing*, 44(4):A2439–A2463, 2022. (Q1, IF: 2.4, GS: 9)

[4] V. DRUSKIN, S. GÜTTEL, AND L. KNIZHNERMAN. Model order reduction of layered waveguides via rational Krylov fitting, *BIT Numerical Mathematics*, 62:1551–1572, 2022. (Q1, IF: 1.5, GS: 2)

[5] S. GÜTTEL AND J. W. PEARSON. A spectral-in-time Newton-Krylov method for nonlinear PDE-constrained optimization, *IMA Journal of Numerical Analysis,* 42(2):1478–1499, 2022. (Q1, IF: 2.3, GS: 9)

[6] S. Güttel AND M. Schweitzer. A comparison of limited-memory Krylov methods for Stieltjes functions of Hermitian matrices, *SIAM Journal on Matrix Analysis and Applications,* 42(1):83–107, 2021. (Q1, IF: 1.9, GS: 12)

[7] L. Barash, S. Güttel, AND I. Hen. Calculating elements of matrix functions using divided differences, *Computer Physics Communications,* 271:108219, 2021. (Q1, IF: 4.4, GS: 1)

[8] E. Poupard, W. P. Heath, AND S. Güttel. A Hamiltonian decomposition for fast interior-point solvers in model predictive control, *Automatica,* 131:109833, 2021. (Q1, IF: 5.9, GS: 2)

[9] I. G. Gosea AND S. Güttel. Algorithms for the rational approximation of matrix-valued functions, *SIAM Journal on Scientific Computing,* 43(5):A3033–A3054, 2021. (Q1, IF: 2.4, GS: 29)

[10] S. Güttel, D. Kressner, AND K. Lund. Limited-memory polynomial methods for large-scale matrix functions, *GAMM Mitteilungen,* 43(4):e202000019, 2020. (Q2, IF: 1.4, GS: 15)

[11] S. Elsworth AND S. Güttel. ABBA: Adaptive Brownian bridge-based symbolic aggregation of time series, *Data Mining and Knowledge Discovery,* 34:1175–1200, 2020. (Q1, IF: 6.3, GS: 22)

[12] S. Elsworth AND S. Güttel. The block rational Arnoldi method, *SIAM Journal on Matrix Analysis and Applications,* 41(2):365–388, 2020. (Q1, IF: 1.9, GS: 22)

[13] C. Qiu, S. Güttel, X. Ren, C. Yin, Y. Liu, B. Zhang, AND G. Egbert. A block rational Krylov method for three-dimensional time-domain marine controlled-source electromagnetic modelling, *Geophysical Journal International,* 218:100–114, 2019. (Q1, IF: 2.9, GS: 33)

[14] S. Elsworth AND S. Güttel. Conversions between barycentric, RKFUN, and Newton rational interpolants, *Linear Algebra and its Applications,* 576:246–257, 2019. (Q1, IF: 1.4, GS: 16)

[15] T. Kinyanjui, J. Middleton, S. Güttel, J. Cassell, J. Ross, AND T. House. Scabies in residential care homes: Modelling, inference and interventions for well-connected population sub-units, *PLOS Computational Biology,* 14(3):1–24, 2018. (Q1, IF: 4.5, GS: 26)

[16] S. Güttel AND J. W. Pearson. A rational deferred correction approach to parabolic optimal control problems, *IMA Journal on Numerical Analysis,* 38:1861–1892, 2018. (Q1, IF: 2.3, GS: 11)

▶ Awards and recognitions

2023   **Royal Society Industry Fellow**—competitively awarded Fellowship for four years

2023   **ILAS Taussky–Todd Prize**—awarded every three years by the International Linear Algebra Society for distinguished contributions to the field of Linear Algebra

2021   **SIAM James H. Wilkinson Prize in Numerical Analysis and Scientific Computing**—one of the Major Prizes awarded by the Society for Industrial and Applied Mathematics

2020   **Fellowship of the Alan Turing Institute**—competitively awarded (first award in 2018)

2018   **Manchester Teaching Excellence Award**—for significant achievements in teaching; up to four prizes awarded annually across U Manchester (approx. 10,000 eligible staff)

2017   **U Manchester Better World Award**—for real-world impact of knowledge transfer

2016   **Fellow of the Higher Education Academy** (now called Advance HE)

2014   **U Manchester Exceptional Performance Reward**—for research and teaching activities

2013   **U Manchester Teaching Awards nominations**—nominated in the categories "Best Lecturer in Engineering and Physical Sciences" and "Most Innovative Lecturer"

2011   **Honourable mention for Householder Prize**—Ph.D. thesis shortlisted for the 2011 Householder Prize for outstanding dissertations in numerical linear algebra

2008   **JSPS Fellowship**—competitive award by the Japan Society for the Promotion of Science

2007   **Georgius-Agricola Medal**—awarded by TU Freiberg for the best Diploma project

2005   **DAAD Stipend**—4-month stipend awarded by *Deutscher Akademischer Austauschdienst*

▶ Grants

2023–2027	Royal Society Industry Fellowship, Arup and Royal Society (£374,856 as PI)
2020–2022	Knowledge Transfer Partnership (KTP) with Arup, Innovate UK (£352,190 as co-I)
2020–2021	Turing Fellow Project, Alan Turing Institute (£73,127 as PI)
2017–2021	KTP with Process Integration Ltd., Innovate UK (£320,581 as PI)
2013–2016	KTP with AspenTech (Sabisu), Technology and Strategy Board (£302,849 as PI)
2012	LMS Research Workshop grant, London Mathematical Society (£2,975 as PI)
2011–2012	Postdoc stipend, German Research Foundation (£49,500 as PI)

C. Conference and workshop activities

▶ Plenary lectures (last 5 years, with expenses covered if applicable)

09/2024	Keynote lecturer at the 48th Woudschoten Conference of the Dutch–Flemish Scientific Computing Society, The Netherlands
06/2023	ILAS Taussky–Todd Prize talk, 25th Conference of the International Linear Algebra Society, Madrid, Spain
03/2021	SIAM James H. Wilkinson Prize talk "Rational Krylov: A Toolkit for Scientific Computing," SIAM Conference on Computational Science and Engineering 2021 (online)
05/2019	Plenary talk at the "Advances in Numerical Linear Algebra: Celebrating the Centenary of the Birth of James H. Wilkinson" conference, U Manchester
05/2018	Plenary talk at the "International Conference on Approximation and Matrix Functions" (AMF18), University of Lille, France
04/2018	Plenary talk at the ICMS Workshop "New Directions in Applied Linear Algebra, Numerical Methods for PDEs, and Applications," Edinburgh

▶ Co-organized conferences and workshops (last 5 years)

2020–22	Online Seminar on Numerical Linear Algebra (sites.google.com/view/e-nla/)
12/2019	Workshop "Computational Complex Analysis," Newton Institute, Cambridge (https://www.newton.ac.uk/event/catw03)
11/2019	Workshop "Mathematics and Data Science: Preparing for a Career as Data Scientist," U Manchester (personalpages.manchester.ac.uk/staff/stefan.guettel/career)
10/2019	GAMM ANLA workshop on "Linear Algebra Challenges in the Sciences," University of Chemnitz, Germany (https://gammanla.wordpress.com/)
06/2019	Workshop "Iterative Methods from the Continuum Perspective," Hamilton Mathematics Institute, Ireland (https://siamukie.wordpress.com/2018/12/18/dublin2019/)
10/2018	GAMM ANLA workshop on "Numerical Linear Algebra Challenges in Optimization," University of Lund, Sweden (https://gammanla.wordpress.com/)
01/2018	SIAM UKIE Annual Meeting 2018, University of Southampton

D. Teaching and learning

I have developed and taught courses at all levels of the mathematics curriculum at U Manchester:

- **MATH36022 Numerical Analysis II:** I currently teach this advanced course for Mathematics undergraduate students in their third year of studies.
- **MATH20621 Programming with Python:** I introduced this course for Mathematics undergraduate students, now a compulsory second-year unit for more than 300 students.
- **MATH20411 PDEs and Vector Calculus B:** I taught this course since 2018, including the preparation of midterm assessments and final exam papers.
- **MATH36001 Matrix Analysis:** I taught this course from 2012–2015, including the preparation of midterm assessments and final exam papers.

In 2018, I received a Manchester Teaching Excellence Award, a University-wide recognition for significant and sustained commitment to excellence in teaching.

E. Leadership and community service

▶ Recent activities in international organisations and committee work

- **ILAS Board of Directors** (elected in 2023). Handling the employment of staff and assume responsibility for the management of the Society. (https://ilasic.org/who-we-are/)
- **SIAM Membership Committee** (since 2020, reappointed in 2022 by the SIAM President). This committee represents the interests of SIAM's 14,500 international members. I also served on the EDI Subcommittee. (https://www.siam.org/about-siam/committees/membership-committee)
- **Vice-Chair of GAMM Activity Group on Numerical and Applied Linear Algebra** (elected in 2015, re-elected in 2018–2021). This group comprises more than 90 international members and holds an annual workshop. (https://gammanla.wordpress.com/about/)
- **Secretary and Treasurer for the SIAM UKIE Section** (elected 2016–2018). The section comprises more than 700 SIAM members based in the UK and Ireland, holds an annual meeting, and sponsors prizes. (https://archive.siam.org/sections/siamukie/)
- **Scientific Committee Member of the Parallel-in-Time Integration Group** (2015–2017), following the organization of its 2013 meeting sponsored by the LMS. (parallel-in-time.org)

▶ Recent work on editorial boards

- **Associate Editor** of *Electronic Transactions on Numerical Analysis* (since 2020)
- **Associate Editor** of the *SIAM Journal on Scientific Computing* (2015–2021)
- **Editor** of *ICIAM Dianoia* (since 2019, https://iciam.org/newsletter/dianoia)
- **Editor** of two *GAMM Mitteilungen* Special Issues on Applied and Numerical Linear Algebra published by Wiley in 2020 (https://onlinelibrary.wiley.com/toc/15222608/2020/43/3)
- **Guest editor** of a 2018 Special Issue of *Linear Algebra and its Applications,* Elsevier (www.sciencedirect.com/journal/linear-algebra-and-its-applications/vol/576/suppl/C)

▶ Internal to the University of Manchester

- **Director of MADSIM** (since 2022). Faculty-wide Doctoral Training Centre for Mathematics and Data in Scientific and Industrial Modelling. Currently 30 PhD students across nine Departments.