

# PROFESSOR STEFAN GÜTTEL

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— Short CV as of October 2021 —

## A. Personal information

Full name	Prof. Dr. rer. nat. Stefan Dietrich Güttel
Date of birth	27 November 1981
Place of birth	Dresden, Germany
Marital status	married, one child
Citizenship	Germany, United Kingdom

### ► Professional experience

2021–	Professor of Applied Mathematics
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., <i>summa cum laude</i> )
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	M.Sc. 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: 1,853. H-index: 23.

- [1] 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: 0)
- [2] 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: 1)
- [3] S. GÜTTEL AND J. W. PEARSON. A spectral-in-time Newton-Krylov method for nonlinear PDE-constrained optimization, *IMA Journal of Numerical Analysis*, online, 2021. (Q1, IF: 2.3, GS: 2)

- [4] 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: 2)
- [5] 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: 12)
- [6] 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: 5)
- [7] 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: 5)
- [8] 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: 11)
- [9] 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 modeling, *Geophysical Journal International*, 218:100–114, 2019. (Q1, IF: 2.9, GS: 13)
- [10] 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: 14)
- [11] 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: 20)
- [12] 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: 9)
- [13] M. BERLJAJA AND S. GÜTTEL. Parallelization of the rational Arnoldi algorithm, *SIAM Journal on Scientific Computing*, 39(5):S197–S221, 2017. (Q1, IF: 2.4, GS: 13)
- [14] M. BERLJAJA AND S. GÜTTEL. The RKFIT algorithm for nonlinear rational approximation, *SIAM Journal on Scientific Computing*, 39(5):A2049–A2071, 2017. (Q1, IF: 2.4, GS: 64)
- [15] S. GÜTTEL AND F. TISSEUR. The nonlinear eigenvalue problem, *Acta Numerica*, 26:1–94, 2017. (Q1, IF: 11.1, GS: 145)

### ► Awards and recognitions

2021	<b>SIAM James H. Wilkinson Prize in Numerical Analysis and Scientific Computing</b> —one of the Major Prizes awarded by the Society for Industrial and Applied Mathematics
2020	<b>Fellowship of the Alan Turing Institute</b> —competitively awarded (first award in 2018)
2018	<b>Manchester Teaching Excellence Award</b> —for significant achievements in teaching; up to four prizes awarded annually across U Manchester (approx. 10,000 eligible staff)
2017	<b>U Manchester Better World Award</b> —for real-world impact of knowledge transfer
2016	<b>Fellow of the Higher Education Academy</b> (now called Advance HE)
2014	<b>U Manchester Exceptional Performance Reward</b> —for research and teaching activities
2013	<b>U Manchester Teaching Awards nominations</b> —nominated in the categories “Best Lecturer in Engineering and Physical Sciences” and “Most Innovative Lecturer”
2011	<b>Honourable mention for Householder Prize</b> —Ph.D. thesis shortlisted for the 2011 Householder Prize for outstanding dissertations in numerical linear algebra
2008	<b>JSPS Fellowship</b> —competitive award by the Japan Society for the Promotion of Science
2007	<b>Georgius-Agricola Medal</b> —awarded annually by TU Freiberg for the best M.Sc. thesis
2005	<b>DAAD Stipend</b> —4-month stipend awarded by <i>Deutscher Akademischer Austauschdienst</i>

### ► Grants

- 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 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 talks (last 5 years, with expenses covered if applicable)

- 06/2022 Plenary talk at the “Thirty years of Acta Numerica” conference, Bedlewo, Poland  
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  
11/2017 Plenary talk at the ICERM Workshop “Recent Advances in Seismic Modeling and Inversion,” Brown University, USA  
08/2017 Plenary talk at the “LMS–EPSRC Symposium on Model Order Reduction,” Durham  
07/2017 SIAG-LA plenary lecture at the ILAS 2017 Conference, Iowa State University, USA

### ► Co-organized conferences and workshops (last 5 years)

- 04/2020– Online Seminar on Numerical Linear Algebra ([sites.google.com/view/e-nla/](https://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](https://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  
01/2017 SIAM UKIE Annual Meeting 2017, University of Strathclyde

## D. Teaching and learning

Since 2012 I teach courses at all levels of the mathematics curriculum at U Manchester, both undergraduate and postgraduate, and have been involved in the development of several courses:

- **MATH20621 Programming with Python:** I introduced this course for Mathematics undergraduate students and have developed it from a small unit with only 50 students until 2017 into a compulsory second-year unit for 360 students in 2021.
- **MATH20411 PDEs and Vector Calculus B:** I taught this course since 2018, including the preparation of midterm assessments and final exam papers.
- **MATH65740 Transferable Skills:** I develop and lead a MATLAB course for this M.Sc.-level unit since 2015. It is now a separately assessed component taken by all Applied Maths M.Sc. students.
- **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

- **SIAM Membership Committee** (since 2020). This committee is appointed by the SIAM President and represents the interests of SIAM's 14,500 international members. (<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). This group comprises more than 90 international members and holds an annual workshop. (<https://gammanla.wordpress.com/>)
- **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](https://parallel-in-time.org))

### ► Recent work on editorial boards

- Associate Editor of the **SIAM Journal on Scientific Computing** (since 2015)
- Associate Editor of **Electronic Transactions on Numerical Analysis** (since 2020)
- 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](https://www.sciencedirect.com/journal/linear-algebra-and-its-applications/vol/576/suppl/C))