

# Tobias Jawecki

Email [tobias.jawecki@gmail.com](mailto:tobias.jawecki@gmail.com)  
Web <https://newbisi.github.io>  
Nationality Austrian



---

## Academic Employment & Teaching Experience

09/2021–08/2022	University Assistant, Institute for Theoretical Physics, TU Wien, Austria
10/2021–02/2022	Exercise Instructor, Institute for Theoretical Physics, TU Wien
03/2017–03/2020	University Assistant, Institute of Analysis and Scientific Computing, TU Wien, experiences as a substitute lecturer
10/2013–06/2016	Exercise Tutor, Institute of Analysis and Scientific Computing, TU Wien

---

## Further Academic Experience

	Participation at international conferences with scientific talks, e.g., CMQT Bath 2022, SciCADE Innsbruck 2019, and seminars, e.g., Oberwolfach Wave Phenomena 2019
02/2019–05/2019	Visiting Researcher at Mathematical Institute, Oxford University, UK

---

## Education

03/2017–12/2022	Doctoral Student Technische Mathematik, TU Wien, Austria Student at the doctoral college Unravelling Advanced 2D Materials
03/2015–03/2017	Diploma Student Technische Mathematik, TU Wien
03/2011–03/2015	Bachelor Student Technische Mathematik, TU Wien
10/2010–02/2011	Bachelor Student Technische Chemie (first semester), TU Wien
06/2009	Matura at Borg Götzis, Vorarlberg, Austria

---

## Preprints

T. Jawecki and P. Singh. Unitarity of some barycentric rational approximants, 2022.  
preprint at <https://arxiv.org/abs/2205.10606>

T. Jawecki. A review of the separation theorem of Chebyshev-Markov-Stieltjes for polynomial and some rational Krylov subspaces, 2022.  
preprint at <https://arxiv.org/abs/2205.01535>

---

## Publications

W. Auzinger, J. Dubois, K. Held, H. Hofstätter, T. Jawecki, A. Kauch, O. Koch, K. Kropielnicka, P. Singh, and C. Watzenböck. Efficient Magnus-type integrators for solar energy conversion in Hubbard models. *J. Comput. Math. Data Sci.*, 2:100018, 2022.

doi: [10.1016/j.jcmds.2021.100018](https://doi.org/10.1016/j.jcmds.2021.100018)

T. Jawecki. A study of defect-based error estimates for the Krylov approximation of  $\varphi$ -functions. *Numer. Algorithms*, 90(1):323–361, 2022.

doi: [10.1007/s11075-021-01190-x](https://doi.org/10.1007/s11075-021-01190-x)

W. Auzinger, T. Jawecki, O. Koch, P. Pukach, R. Stolyarchuk, and E.B. Weinmüller. Some aspects on [numerical] stability of evolution equations of stiff type; use of computer algebra. In *2021 IEEE XVII th International Conference on the Perspective Technologies and Methods in MEMS Design (MEMSTECH)*, pages 180–184, 2021.

doi: [10.1109/memstech53091.2021.9468055](https://doi.org/10.1109/memstech53091.2021.9468055)

C. Schattauer, L. Linhart, T. Fabian, T. Jawecki, W. Auzinger, and F. Libisch. Graphene quantum dot states near defects. *Phys. Rev. B*, 102:155430, 2020.

doi: [10.1103/PhysRevB.102.155430](https://doi.org/10.1103/PhysRevB.102.155430)

T. Jawecki, W. Auzinger, and O. Koch. Computable upper error bounds for Krylov approximations to matrix exponentials and associated  $\varphi$ -functions. *BIT*, 60(1):157–197, 2020.

doi: [10.1007/s10543-019-00771-6](https://doi.org/10.1007/s10543-019-00771-6)

---

## Theses

T. Jawecki. Krylov techniques and approximations to the action of matrix exponentials. Ph.D thesis, TU Wien, Austria, 2022.

doi: [10.34726/hss.2022.45083](https://doi.org/10.34726/hss.2022.45083)

T. Jawecki. Bifurcation analysis via numerical continuation for nonlinear fourth-order partial differential equations. Diploma thesis, TU Wien, 2017.

available online at <https://permalink.catalogplus.tuwien.at/AC13642458>