



GESELLSCHAFT DEUTSCHER CHEMIKER
ORTSVERBAND HANNOVER

Einladung zum GDCh-Colloquium des Ortsverbandes Hannover

Das Colloquium findet um 17h c.t. im Dr.-Oetker-HS (Raum 007, Gebäude 2504) der Leibniz Universität Hannover, Institut für Physikalische Chemie und Elektrochemie, Callinstraße 3a, D-30167 Hannover statt.

16.11.2023 Prof. Dr. Steffen Glaser
Technische Universität München

Optimal control and visualization of spin and qubit states in NMR and quantum computing

Analytical and numerical tools of optimal control theory make it possible to explore the performance limits of pulse sequences in nuclear magnetic resonance spectroscopy and quantum technologies [1]. These tools can provide pulse sequences of unprecedented fidelity and robustness, but also new analytical and geometrical insight and a deeper understanding of pulse optimization problems. After the initial focus on the performance limits of individual pulses, the perspective has been more and more widened to the design of cooperative broadband pulses, which have the ability to cancel each other's imperfections [2]. Optimal control methods also help to optimize the performance of quantum computers. Finally, advanced visualization techniques based on the so-called DROPS representation [3] will be demonstrated, which make it possible to see the dynamics of abstract spin and qubit states in a way that is not only intuitive but also exact.

[1] Glaser et al., Eur. Phys. J. D 69, 279 (2015); Koch et al., Eur. Phys. J. Quantum Technology 9, 19 (2022).

[2] Braun and Glaser, New J. Phys. 16, 115002 (2014); Asami et al., Angew. Chem. Int. Ed. 57 (2018), Kallies and Glaser, J. Magn. Reson. 286, 115 (2018).

[3] Garon et al., Phys. Rev. A 91, 042122 (2015); Leiner et al., J. Phys. A: Math. Theor. 53, 495301 (2020).

Prof. Dr. Jens-Uwe Grabow
Vorsitz OV Hannover

Vor dem Vortrag findet eine ‚Kaffeerunde‘ in der Bibliothek des PCI statt.