

Daniel Fischer, Ph.D.

🏠 Missouri University of Science and Technology, Department of Physics

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Education

- 2014 📖 **Venia Legendi (Habilitation), Heidelberg University.**
Professional dissertation title: *Few-particle quantum-dynamics in ion-atom collisions.*
- 2003 📖 **Ph.D. in Physics (*summa cum laude*), Heidelberg University.**
Thesis title: *Few-particle dynamics in the single and double ionization of helium by charged particle impact.*
- 2001 📖 **Diploma (M.Sc.) in Physics, University of Freiburg i. Br.**
Thesis title: *Assembly of a Reaction Microscope for the investigation of ion-atom collisions.*

Employment History

- since 2020 📖 **Associate Professor.** Missouri University of Science and Technology, Rolla, Missouri.
- 2015 – 2020 📖 **Assistant Professor.** Missouri University of Science and Technology, Rolla, Missouri.
- 2014 📖 **Research group leader.** Max Planck Institute for Nuclear Physics, Heidelberg, Germany.
- 2009-2014 📖 **Emmy-Noether independent research group leader.** Max Planck Institute for Nuclear Physics, Heidelberg, Germany.
- 2008-2009 📖 **Postdoctoral research scientist.** Max Planck Institute for Nuclear Physics, Heidelberg, Germany.
- 2005-2007 📖 **Postdoctoral research scientist.** Stockholm University, Stockholm, Sweden.
- 2004-2005 📖 **Postdoctoral research scientist.** Max Planck Institute for Nuclear Physics, Heidelberg, Germany.
- 2001-2003 📖 **Research assistant.** Max Planck Institute for Nuclear Physics, Heidelberg, Germany.

Scholarly contributions

Summary

- Author/co-author of 83 peer-reviewed journal articles (since 2001), h-index 31, 3780 citations (source: google scholar, 9/15/2023), <https://scholar.google.com/citations?hl=en&user=EmAf1Q8AAAAJ>.
- Author/co-author of three book chapters.
- Author of two articles for the general public.
- Over 60 invited presentations at conferences, workshops, colloquia, and seminars.

Recent Journal Articles

- 1 B. P. Acharya, S. Dubey, K. L. Romans, A. H. N. C. D. Silva, K. Foster, O. Russ, K. Bartschat, N. Douguet, and **D. Fischer**, “Two-path interference in resonance-enhanced few-photon ionization of Li atoms,” *Physical Review A*, vol. 106, no. 2, p. 023113, Aug. 2022. 📄DOI: 10.1103/physreva.106.023113.
- 2 B. P. Acharya, M. Dodson, S. Dubey, K. L. Romans, A. H. N. C. D. Silva, K. Foster, O. Russ, K. Bartschat, N. Douguet, and **D. Fischer**, “Magnetic dichroism in few-photon ionization of polarized atoms,” *Physical Review A*, vol. 104, no. 5, p. 053103, Nov. 2021. 📄DOI: 10.1103/physreva.104.053103.





- 3 N. Kurz, **D. Fischer**, T. Pfeifer, and A. Dorn, “Reaction microscope for investigating ionization dynamics of weakly bound alkali dimers,” *Review of Scientific Instruments*, vol. 92, no. 12, Dec. 2021. [DOI: 10.1063/5.0069506](https://doi.org/10.1063/5.0069506).
- 4 A. H. N. C. D. Silva, T. Moon, K. L. Romans, B. P. Acharya, S. Dubey, K. Foster, O. Russ, C. Rischbieter, N. Douguet, K. Bartschat, and **D. Fischer**, “Circular dichroism in atomic resonance-enhanced few-photon ionization,” *Physical Review A*, vol. 103, no. 5, p. 053 125, May 2021. [DOI: 10.1103/physreva.103.053125](https://doi.org/10.1103/physreva.103.053125).
- 5 A. D. Silva, D. Atri-Schuller, S. Dubey, B. Acharya, K. Romans, K. Foster, O. Russ, K. Compton, C. Rischbieter, N. Douguet, K. Bartschat, and **D. Fischer**, “Using circular dichroism to control energy transfer in multiphoton ionization,” *Physical Review Letters*, vol. 126, no. 2, p. 023 201, Jan. 2021. [DOI: 10.1103/physrevlett.126.023201](https://doi.org/10.1103/physrevlett.126.023201).
- 6 F. Thini, K. L. Romans, B. P. Acharya, A. H. N. C. de Silva, K. Compton, K. Foster, C. Rischbieter, O. Russ, S. Sharma, S. Dubey, and **D. Fischer**, “Photo-ionization of polarized lithium atoms out of an all-optical atom trap: A complete experiment,” *Journal of Physics B: Atomic, Molecular and Optical Physics*, vol. 53, no. 9, p. 095 201, Mar. 2020. [DOI: 10.1088/1361-6455/ab7671](https://doi.org/10.1088/1361-6455/ab7671).
- 7 A. Bhandare, A. Patnaik, D. Pommerenke, S. Sharma, and **D. Fischer**, “Low cost fast frequency switching driver for acousto-optic modulators used in laser cooling,” *HardwareX*, vol. 5, e00054, Apr. 2019. [DOI: 10.1016/j.ohx.2019.e00054](https://doi.org/10.1016/j.ohx.2019.e00054).
- 8 S. Sharma, B. P. Acharya, A. H. N. C. D. Silva, N. W. Parris, B. J. Ramsey, K. L. Romans, A. Dorn, V. L. B. de Jesus, and **D. Fischer**, “All-optical atom trap as a target for MOTRIMS-like collision experiments,” *Physical Review A*, vol. 97, no. 4, p. 043 427, Apr. 2018. [DOI: 10.1103/physreva.97.043427](https://doi.org/10.1103/physreva.97.043427).

Book Chapters

- 1 T. Jahnke, V. Mergel, O. Jagutzki, A. Czasch, K. Ullmann, R. Ali, V. Frohne, T. Weber, L. P. Schmidt, S. Eckart, M. Schöffler, S. Schößler, S. Voss, A. Landers, **D. Fischer**, M. Schulz, A. Dorn, L. Spielberger, R. Moshhammer, R. Olson, M. Prior, R. Dörner, J. Ullrich, C. L. Cocke, and H. Schmidt-Böcking, “High-resolution momentum imaging—from stern’s molecular beam method to the COLTRIMS reaction microscope,” in *Molecular Beams in Physics and Chemistry*, Springer International Publishing, 2021, pp. 375–441. [DOI: 10.1007/978-3-030-63963-1_18](https://doi.org/10.1007/978-3-030-63963-1_18).
- 2 **D. Fischer**, “6. recoil ion momentum spectroscopy with laser-cooled targets,” in *Ion-Atom Collisions*, De Gruyter, Oct. 2019, pp. 103–156. [DOI: 10.1515/9783110580297-006](https://doi.org/10.1515/9783110580297-006).
- 3 R. Moshhammer, **D. Fischer**, and H. Kollmus, “Recoil-ion momentum spectroscopy and reaction microscopes,” in *Many-Particle Quantum Dynamics in Atomic and Molecular Fragmentation*, Springer Berlin Heidelberg, 2003, pp. 33–58. [DOI: 10.1007/978-3-662-08492-2_2](https://doi.org/10.1007/978-3-662-08492-2_2).

Honors and Awards

Awards

- 2022  **Faculty Research Award**, Missouri University of Science and Technology.
- 2020  **Faculty Research Award**, College of Arts, Science, and Business, Missouri University of Science and Technology.
- 2006-2007  **Postdoctoral Fellowship**, Swedish Research Council (Vetenskapsrådet)
- 2004  **Otto Hahn Medal** for “the investigation of quantum dynamics in correlated two-electron systems by means of kinematically complete experiments”, Max-Planck Society.

Research Grants (PI)

- since 2022 **■** *Coherent Control and Analysis of Atomic Multi-Photon Processes* (PHY-2207854). National Science Foundation. Amount: \$493,565.
- 2016-2022 **■** *CAREER: Control and Analysis of Atomic Few-Body Dynamics* (PHY-1554776). CAREER program of the National Science Foundation. Amount: \$800,000.
- 2015 **■** *Control and Analysis of Atomic Few-Body Systems*. University of Missouri Research Board. Amount: \$20,000.
- 2008-2017 **■** *An ultra-cold target for precision studies of heavy-ion atom collisions* (project number 76879065). Emmy-Noether program of the German Research Foundation (DFG). Amount: \$1,500,000 (estimated).

Mentoring

Graduate Students Supervised

- ongoing **■** **Kyle Foster**.
- ongoing **■** **Shruti Majumdar**.
- 2023 **■** **Kevin Romans**. Thesis title: *Photoionization of spin-polarized Rydberg atoms out of a continuous wave optical dipole trap*.
- 2021 **■** **Bishnu Prasad Acharya**. Thesis title: *Complete experiments on multi-photon ionizations of ultra-cold and polarized atoms*.
- 2020 **■** **A. H. Nishshanka C. De Silva**. Thesis title: *Symmetry-breaking in the multi-photon ionization dynamics of oriented atoms*.
- 2014 **■** **Johannes D. Goullon**. Thesis title: *One- and two-electron processes in charge transfer and single ionization in ion-lithium collisions*
- 2013 **■** **Renate Hubele**. Thesis title: *Kinematically complete and state-selective investigation of collision-induced single ionization of lithium*.
- 2012 **■** **Katharina E. Schneider**. Thesis title: *Dynamics in charge transfer and ionization processes in fast ion-helium collisions*.

Selected Service Activities

- 2023 **■** **Member of the Local Organizing Committee** of the *International Conference on Photonic, Electronic, and Atomic Collisions* (ICPEAC), Ottawa, Canada, July 25 - August 1, 2023.
- 2023 **■** **Local Chair** of the *International Symposium on Ion-Atom Collisions* (ISIAC), Rolla, Missouri, July 21 - 24, 2023.
- since 2023 **■** **Member of the international advisory committee** of the *International Symposium on Correlation, Polarization and Ionization in Atomic and Molecular Collisions* (COPIAMC).
- since 2014 **■** **Member of the international advisory committee** of the *International Symposium on Ion-Atom Collisions* (ISIAC).
- 2012 **■** **Member of the Local Organizing Committee** of the *International Conference on the Physics of Highly Charged Ions* (HCI), Heidelberg, Germany, September 2 - 7, 2012.
- 2007 **■** **Member of the Local Organizing Committee** of the *International Workshop on Electrostatic Storage Devices* (ESD), Stockholm, Sweden, June 17 - 21, 2007.
- **Refereeing for scientific journals** including Physical Review Letter, Physics Review A, Journal of Physics B, Atoms, Review of Scientific Instruments, Atoms, and others.

Memberships

- German Physical Society (DPG)
- American Physical Society (APS)
- American Association of University Professors (AAUP)