

Gabi Steinbach

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PERSONAL STATEMENT

I am a physicist by training with a passion for advancing scientific innovation and excellence. I accomplish this goal, first, by uniting different perspectives in interdisciplinary research projects and, second, by effectively promoting the potential of the diverse people who contribute to the exciting endeavor of science. I gained substantial experience in different interdisciplinary scientific environments when researching at universities and at a national research institute on three different continents. I now aim to leverage my conceptual skills in research, mentoring, event organization, and research management to foster international, interdisciplinary collaboration and to support early career scientists in creating impactful and fulfilling careers, which I believe is at the heart of creative and sustainable innovation.

EDUCATION

PhD in Physics Helmholtz-Center Dresden-Rossendorf / Chemnitz University of Technology Thesis title: Ferromagnetic colloids with anisotropic magnetization distribution: self-assembly and response to magnetic fields (summa cum laude)	Dresden, Germany 09/2011 – 05/2016
Diploma in Physics Chemnitz University of Technology Thesis title: Density functional theory investigation of heteroepitaxial GaP on Si (100) (very good)	Chemnitz, Germany 10/2005 – 04/2011
Exchange Student in Physics and Japanese Nagoya University Thesis title: Löwdin orthogonalization in quantum chemistry and electron band theory (very good)	Nagoya, Japan 04/2009 – 03/2010

WORK EXPERIENCE

Scientific Research Coordinator Institute of Biological Sciences Georgia Institute of Technology <ul style="list-style-type: none">Coordinate several national and international research collaborations on viral dynamicsLead teaching and training events on scientific project coordination and early career development	Atlanta, GA, USA since 12/2020
Postdoctoral Research Fellow in Biological Materials Institute of Physics, Georgia Institute of Technology <ul style="list-style-type: none">Developed bio-physical concepts of living matter that connect cell biology and material physicsStudied the interrelated role of spatial and social (deadly) interactions in bacterial biofilmsAdvanced experimental protocols for biofilm visualization using confocal microscopy and interferometryCoordinated collaboration between research groups of physicists, biologist and engineers	Atlanta, GA, USA 01/2018 – present
Research Assistant in Theoretical Material Physics Institute of Physics, Chemnitz University of Technology <ul style="list-style-type: none">Coordinated research collaboration between theoretical and experimental physics groupsPerformed and published research on numerical simulations of anisotropic ferrofluids	Chemnitz, Germany 10/2017-12/2017
Graduate Research Assistant in Experimental Material Physics Helmholtz-Center Dresden-Rossendorf (HZDR) <ul style="list-style-type: none">Established new research direction on tunable soft matter as first soft matter student in the labDeveloped video microscopy setup and image analysis algorithm for single-particle orientational analysisDesigned and published four original experimental concepts on anisotropic self-organization and dynamicsInitiated two international collaborations for joint theoretical and experimental materials study	Dresden, Germany 09/2011 – 04/2016
Research Assistant in Experimental Material Physics Center for Soft Matter Research (CSMR), New York University <ul style="list-style-type: none">Initiated international collaboration with the CSMR and conducted research on laser controlled soft matterObtained travel and research funding from German Academic Exchange Service (DAAD)	New York City, NY, USA 09-10/2014

TEACHING

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- Tech to Teaching Certificate** Atlanta, GA, USA
Center for Teaching and Learning, Georgia Institute of Technology 2018-2019
- Completed two graduate-level courses to prepare future faculty in pedagogy and course design
 - Participated in a capstone teaching experience that included evaluation of teaching skills in a postdoc cohort
- Microscopy workshops** Atlanta, GA, USA
Institute of Physics, Georgia Institute of Technology 06-08/2019
- Designed, organized, and conducted hands-on microscopy workshops using evidence-based methods
 - Accommodated 50 participants from various disciplines (biology, physics, engineering) and academic rank (from undergraduate to graduate students, postdocs and technicians) in each course
 - Initiated networking between participants and on-campus Microscopy Core Facility for direct application
- Lecturer** Chemnitz, Germany
Institute of Physics, Chemnitz University of Technology 2009-2010
- Coevolved and taught course on mathematical methods in physics
 - Developed course assessment and conducted grading

MENTORING / OUTREACH

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- Career Coach Volunteer for College Students** 2021-present
America Needs You (ANY)
- Coach first generation college students virtually with the non-profit organization ANY
 - Advise students in career orientation and professional development one-on-one and in group sessions
- Physics Courses at Elementary School** 2012
Elementary School Reichenhain, Chemnitz, Germany
- Organized and conducted hands-on physics workshops in astronomy, acoustics and optics for elementary school students
- Mentor/Advisor** diverse
- Trained and mentored 15+ students in the lab, including REU and RISE DAAD-funded students in technical and conceptual skills for soft matter and bio-physics research
 - Guided several physics lab tours for high school students
 - Advised four high school students during two summer research projects
 - Assisted several students in writing research proposals and scholarship applications (PURA, DFG)

PROFESSIONAL SERVICE

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- Faculty Hiring Committee at CMDI, Georgia Tech** 2021
- Conducted virtual interviews with faculty candidates during two hiring processes
 - Provided statement of evaluation for each applicant to the hiring manager
- Conference organizer of 'ELife', Atlanta, USA** 2019
- Co-organized interdisciplinary conference: "ELife - evolution of complex life" with 150 participants
 - Organized panel discussions on interdisciplinary research and training
 - Involved in sponsor acquisition, diverse speaker selection, budgeting and programming
- PhD Student Representative, HZDR** 2011-2013
- Organized joint annual conferences for all PhD students at HZDR that promoted networking, interdisciplinary exchange and professional development
 - Evaluated conference success via two surveys after the event and a few months later
 - Provided individual counseling and support for PhD students
- Scientific Reviewer**
- Reviewed undergraduate student research grant applications at Georgia Tech 2019-2021
 - Peer-reviewed scientific articles (*Soft Matter*)

LEADERSHIP / MANAGEMENT TRAINING

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- Online Course 'Building Skills for A Successful Career'** virtual
The Postdoc Academy 08/2014 – 09/2021
- Completed a 7-week course that trains postdocs in strategic career development and leadership skills
- Responsible Conduct of Research Workshop** Atlanta, GA, USA
Georgia Institute of Technology 04-06/2020
- Attended a virtual course series on research conduct, with topics ranging from Peer Review to Research Misconduct, Science and Engineering in Society, and Plagiarism
- Research Management Program "GET STARTED"** Dresden, Germany
Technical University Dresden 01/2014 – 09/2014
- Completed a two-semester training program that prepares PhD students in research and project management, leadership and funding acquisition
- Professional Development Courses** Chemnitz, Germany
Chemnitz University of Technology 2012/2013
- Attended course series on Academic Writing, Project Management, and Intercultural Communication

FUNDING AND AWARDS

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- Leopoldina German Academy of Sciences Postdoctoral Fellowship – \$193,000 2018/2019
 - German Research Foundation (DFG) Fellowship – \$193,000 (awarded, but declined) 2018
 - Jasso Scholarship for student exchange at the University of Nagoya, Japan – \$10,000 2009/2010
 - Several workshop funding and travel awards (e.g., DAAD, APS, IEEE) – total of ~\$6,000 diverse

PUBLICATIONS

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- M. Matherne, C. Dowell-Esquivel, O. Howington, O. Lenaghan, **G. Steinbach**, P. J. Yunker, and D. L. Hu. Biomechanics of pollen pellet removal by the honey bee. *J. Roy. Soc. Interfaces* 18, 20210549 (2021).
 - C. V. Crisan, H. Chandrashekar, C. Everly, **G. Steinbach**, S. E. Hill, P. J. Yunker, R. R. Lieberman, and B. K. Hammer. A New Contact Killing Toxin Permeabilizes Cells and Belongs to a Broadly Distributed Protein Family. *Mosphere* 6, e00318-21 (2021).
 - C. V. Crisan, H. L. Nichols, S. Wiesenfeld, **G. Steinbach**, P. Yunker, and B. K. Hammer. Glucose confers protection to *Escherichia coli* against contact killing by *Vibrio cholerae*. *Scientific Reports* 11, 1-11 (2021).
 - G. Steinbach**, C. V. Crisan, S. L. Ng, B. K. Hammer, P. J. Yunker. Accumulation of dead cells from contact killing facilitates coexistence in bacterial biofilms. *J. Roy. Soc. Interfaces* 17, 20200486 (2020).
 - G. Steinbach**, M. Schreiber, D. Nissen, M. Albrecht, S. Gemming, and A. Erbe. Anisotropy of colloidal components propels field-activated stirrers and movers. *Phys. Rev. Research* 2, 023092 (2020).
 - C. V. Crisan, A. T. Chande, K. Williams, V. Raghuram, L. Rishishwar, **G. Steinbach**, S. Watve, P. J. Yunker, K. I. Jordan, and B. K. Hammer. Analysis of *Vibrio cholerae* genomes using a novel bioinformatic tool identifies new, active Type VI Secretion System gene clusters. *Genome Biol.* 20, 163 (2019).
 - M. Neumann, A. Strobel, Y. Al-Saadawi, **G. Steinbach**, A. Erbe, and S. Gemming. A Two-Parameter Model for Colloidal Particles with an Extended Magnetic Cap. *Physica Status Solidi A* 216, 1900506 (2019).
 - G. Steinbach**, M. Schreiber, D. Nissen, M. Albrecht, E. V. Novak, P. A. Sanchez, S. S. Kantorovich, S. Gemming, and A. Erbe. Field-responsive colloidal assemblies defined by magnetic anisotropy. *Phys. Rev. E* 100, 012608 (2019).
 - G. Steinbach**, S. Gemming, and A. Erbe. Rotational friction of dipolar colloids measured by driven torsional oscillations. *Sci. Rep.* 6, 34193 (2016).
 - G. Steinbach**, S. Gemming, and A. Erbe. Non-equilibrium dynamics of magnetically anisotropic particles under oscillating fields. *Eur. Phys. J. E* 39, 69 (2016).
Featured in EPJ E Research Highlights: Asymmetrical magnetic microbeads transform into micro-robots; referenced in popular science news outlets (Eureka Alert, Alpha Galileo, Phys.org)
 - G. Steinbach**, D. Nissen, M. Albrecht, E. V. Novak, P. A. Sanchez, S. S. Kantorovich, S. Gemming, and A. Erbe. Bistable self-assembly in homogeneous colloidal systems for flexible modular architectures. *Soft Matter* 12, 2737-2743 (2016).
 - O. Supplie, M. M. May, **G. Steinbach**, O. Romanyuk, F. Grosse, A. Nägelein, P. Kleinschmidt, S. Bruckner, and T. Hannappel. Time-resolved in situ spectroscopy during formation of the GaP/Si(100) heterointerface. *J. Phys. Chem. Lett.* 6, 464-469 (2015).
 - G. Steinbach**, M. Schreiber, and S. Gemming. DFT investigation of the heterostructure GaP(001) on Si(001). *Nanosci. Nanotechnol. Lett.* 5, 73-77 (2013).

PROFESSIONAL MEMBERSHIPS

- National Postdoctoral Association (NPA), USA
- Graduate Career Consortium (GCC), USA
 - Active member of the 'Community of Practice for International GCCers' that aims at improving career conditions for international professionals in academia
- Association for Women in Sciences (AWIS), USA
- German Physical Society (DPG), Germany
- American Physical Society (APS), USA
- Deutsche Gesellschaft für Biophysik (German Association for Biophysics, DGfB), Germany

LANGUAGES

- German (native)
- English (fluent, oral and written)
- Japanese (intermediate beginner)

Atlanta, GA, USA, 01/06/2022