

CURRICULUM VITAE

Sangkha Borah

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PERSONAL INFORMATION

- **Date & Place of Birth** : 31 August 1989; Assam, India; **Nationality** : Indian; **Gender** : Male.
- **Google Scholar Link**: <https://scholar.google.com/citations?user=qfByhykAAAAJ&hl=en>
- **ORCID ID**: 0000-0002-6212-6245

CURRENT RESEARCH INTEREST

- Machine Learning (in particular, Reinforcement Learning (RL)) for quantum technology and quantum computing applications.
- Quantum error correction (QEC)
- Quantum feedback control
- Quantum ML and Neuromorphic computing
- Applications of ML and quantum computing for fundamental research of interdisciplinary nature in physics, chemistry, and material science.

PROFESSIONAL EXPERIENCE

- **May. 2025 – Now**: Assistant Professor, Department of Physics, Indian Institute of Technology Hyderabad.
- **Dec. 2022 – May. 2025**: Postdoctoral researcher, Marquardt Theory Division, Max Planck Institute for the Science of Light and Friedrich-Alexander-Universität Erlangen-Nürnberg (University of Erlangen), Germany [working for Munich Quantum Valley (MQV), an initiative by the German government to build the first quantum computer of Germany in Munich] (Advisor: Prof. Florian Marquardt)
- **Aug. 2020 – Nov. 2022** : Postdoctoral researcher, Quantum Machines Unit, Okinawa Institute of Science and Technology (OIST), Okinawa, Japan (Advisor: Prof. Jason Twamley).
- **Apr. 2020 - July 2020** : Visiting researcher, Quantum Systems Unit, Okinawa Institute of Science and Technology (OIST), Okinawa, Japan (Advisor: Prof. Thomas Busch).
- **Sept. 2018 – March 2020** : Postdoctoral researcher, Quantum Transport and Electronic Structure Theory Unit, Okinawa Institute of Science and Technology (OIST), Okinawa, Japan (Advisor: Prof. Fabian Pauly, now in University of Augsburg, Germany).

DOCTORAL RESEARCH

- **Aug. 2013 – Jul. 2018**: Ph.D. in Physics (Atomistic Modeling and Simulation Group), Indian Institute of Technology (IIT) Guwahati, Assam, India. Thesis title: “Ab-initio Molecular Dynamics Investigation of the Structural, Dynamical and Spectroscopic Aspects of Waterborne Selenium and Arsenic Species”. (Advisor: Prof. Padma Kumar Padmanabhan).

EDUCATION

- **M.Sc. in Physics**, Indian Institute of Technology (IIT) Guwahati, Assam, India. 2013
CGPA: 7.99/10 (First class)
- **B.Sc. in Physics**, Cotton College under Gauhati University, Guwahati, Assam, India. 2010
Percentage: 80.4% (First class third rank in the university)
- **Higher Secondary in Science**, North Lakhimpur College, Lakhimpur, Assam, India. 2007
Percentage: 83.2% (First class)
- **High School**, Namani Subansiri High School, Lakhimpur, Assam, India. 2005
Percentage: 88.7% (First class)

RESEARCH PUBLICATIONS

List of published papers (denotes the corresponding author)*

1. Matteo Puviani, Sangkha Borah, Remmy Zen, Jan Olle, Florian Marquardt, Non-Markovian feedback for optimized quantum error correction, *Physical Review Letters*, 134, 020601, Jan., 2025 Impact factor: 8.1 (2023)
2. Jacques Kotoko, Komi Sodoga, Yusuf Shaidu, Nicola Seriani, Sangkha Borah, and Katawoura Beltako, Uniaxial Tensile-Induced Phase Transition in Graphynes, *Journal of Physical Chemistry C*, 128, 17058, Sep. 2024. Impact factor: 3.3 (2023)
3. Sangkha Borah* and Bijita Sarma, No-collapse accurate quantum feedback control via conditional state tomography, *Physical Review Letters*, 131, 210803, Nov., 2023. Impact factor: 8.1 (2023)
4. Bijita Sarma, Sangkha Borah, A Kani, and Jason Twamley, Accelerated motional cooling with deep reinforcement learning, *Physical Review Research (Letter)*, 4, L042038, Nov., 2022. Impact factor: 3.5 (2023)
5. Sangkha Borah*, Bijita Sarma, Michael Kewming, Fernando Quijandria, Gerard J. Milburn, and Jason Twamley, Measurement based estimator scheme for continuous quantum error correction, *Physical Review Research*, 4, 033207, Sept., 2022. Impact factor: 3.5 (2023)
6. Sangkha Borah, Dinesh Yadav, Maxim Trushin, and Fabian Pauly, Phonon-assisted carrier cooling in h-BN/graphene van der waals heterostructures, *Physical Review B*, 105, 245419, June, 2022. Impact factor: 3.2 (2023)
7. Soham Mukherjee, Deepika Sharma, Ajay Kumar Sharma, Shreya Jaiswal, Nancy Sharma, Sangkha Borah*, and Gurjot Kaur, Flavan-based phytoconstituents inhibit mpro, a sars-cov-2 molecular target, in silico, *Journal of Biomolecular Structure and Dynamics*, 40, 11545, Dec., 2021. Impact factor: 2.7 (2023)
8. Sangkha Borah*, Bijita Sarma, Michael Kewming, Gerard J. Milburn, and Jason Twamley, Measurement-based feedback quantum control with deep reinforcement learning for a double-well nonlinear potential, *Physical Review Letters*, 127(19), 190403, Nov., 2021. Impact factor: 8.1 (2023)
9. Krishnanjan Pramanik, Sangkha Borah, and P Padma Kumar, Accessing slow diffusion in solids employing metadynamics simulation, *Physical Chemistry Chemical Physics*, 22, 22796, Oct., 2020. Impact factor: 2.9 (2023)
10. Sangkha Borah*, Spatially resolved hydration shells and dynamics of different sulfur species in water from first-principle molecular dynamics simulations, *Journal of Molecular Liquids*, 312, 113387, Aug., 2020. Impact factor: 5.3 (2023)
11. Sangkha Borah*, Hydration properties of $H_nPO_4^{n-3}$ ($n = 0 - 3$) from ab initio molecular dynamics simulations, *The Journal of Physical Chemistry B*, 124, 5454, July, 2020. Impact factor: 2.8 (2023)
12. Sangkha Borah* and P Padma Kumar, Hydration structure of As-III aqueous solutions from ab initio molecular dynamics simulations, *Journal of Molecular Liquids*, 318, 114056, 2020. Impact factor: 5.3 (2023)

13. Sangkha Borah and P Padma Kumar, First-principle molecular dynamics investigation of waterborne As-V species, *The Journal of Physical Chemistry B*, 122, 3153, Mar., 2018. Impact factor: 2.8 (2023)
14. Sangkha Borah and P Padma Kumar, Ab initio molecular dynamics study of Se (IV) species in aqueous environment, *Physical Chemistry Chemical Physics*, 18, 26755, Sept., 2016. Impact factor: 2.9 (2023)
15. Sangkha Borah and P Padma Kumar, Ab initio molecular dynamics investigation of structural, dynamic and spectroscopic aspects of Se (VI) species in the aqueous environment, *Physical Chemistry Chemical Physics*, 18, 14561, May, 2016. Impact factor: 2.9 (2023)

Manuscript under review

1. Bijita Sarma, Junxin Chen and Sangkha Borah*, Precision Quantum Parameter Inference with Continuous Observations. arXiv preprint arXiv.2407.12650 [Under review in *Physical Review Letters*]

Manuscript under preparation

1. Sangkha Borah* and Gerard J. Milburn, Advancing Laser Precision: Conditional Feedback for Reducing Laser Linewidth.
2. Sangkha Borah*, ..., and Florian Marquardt, Reinforcement learning for fault-tolerant quantum error correction and characterization.

Top five papers

1. Sangkha Borah*, Bijita Sarma, Michael Kewming, Gerard J Milburn, and Jason Twamley. Measurement-based feedback quantum control with deep reinforcement learning for a double-well nonlinear potential. *Physical Review Letters*, 127(19), 190403, 2021. In the news: phys.org.
2. Sangkha Borah* and Bijita Sarma. No-Collapse Accurate Quantum Feedback Control via Conditional State Tomography. *Physical Review Letters*, 131, 210803, 2023.
3. Matteo Puviani, Sangkha Borah, Remmy Zen, Jan Olle, Florian Marquardt, Non-Markovian feedback for optimized quantum error correction, *Physical Review Letters*, 134, 020601, Jan., 2025 Impact factor: 8.1 (2023)
4. Bijita Sarma, Sangkha Borah, A Kani, and Jason Twamley. Accelerated motional cooling with deep reinforcement learning. *Physical Review Research (Letter)*, 4, L042038, 2022. In the news: phys.org
5. Sangkha Borah*, Bijita Sarma, Michael Kewming, Fernando Quijandria, Gerard J. Milburn, and Jason Twamley. Measurement based estimator scheme for continuous quantum error correction. *Physical Review Research*, 4, 033207, 2022. In news: phys.org

MEDIA RELEASES

- **Machine learning - a useful tool for quantum control.** For the publication: *Physical Review Letters*, 127(19):190403, 2021. Links: phys.org, OIST
- **MBE-CQEC: A new scheme to correct quantum errors.** For the publication: *Physical Review Research*, 4:033207, 2022. Links: phys.org, OIST
- **Pulses driven by artificial intelligence tame quantum systems.** For the publication: *Physical Review Research (Letter)*, 4, L042038, 2022. Links: phys.org, OIST

AWARDS & ACHIEVEMENTS

- 2013: Qualified Graduate Aptitude Test in Engineering (GATE) for pursuing Ph.D. in IITs and other research institutes across India.
- 2013: Merit scholarship of ₹100,000.00 received from the Chief Minister of Assam under the Chief Minister's Scheme for Financial Assistance to Meritorious Students of Assam.
- 2011-2013: Merit Scholarship (McM) during M.Sc.
- 2011: Qualified Joint Admission Test for M.Sc. (JAM) for joining IITs for M.Sc.
- 2010: Placed in the top three, Gauhati University, in B.Sc. Physics, batch of 2010.
- 2007: Vidya Bhushan award, Amul India, for excellence in the Class XII level examination in India.
- 2007: Merit Scholarship, Director of Higher Education, Assam, for excellence in the Class XII level examination in the state of Assam.
- 2005: Anundoram Borooah Award, Assam Government, for excellence in the Class X level examination in Assam.
- 2005: Distinction marks, High School Examination of class X.

TEACHING EXPERIENCE

- **Apr, 2024 - Jul, 2024:** Teaching assistant for the course 'Machine learning for physicists' at FAU, Erlangen, Course instructor: Prof. Florian Marquardt.
- **Jun 11, 2024:** Lecture on 'Restricted Boltzmann Machines' as part of the course 'Machine Learning in Physics', Course instructor: Prof. Florian Marquardt.
- **2024, May 06 - May 08:** Intensive Course on Machine Learning: From Basics to Advanced Concepts. Organized within the QuCoLiMa research network and IMPRS-PL at the Max Planck Institute for the Science of Light, Erlangen, Germany. Topic: Machine learning for quantum control.
- **Jan, 2023 - Mar, 2024:** Organizer and presenter of weekly 'machine learning discussion group' sessions at the Max Planck Institute for the Science of Light, Germany. Topics discussed: (i) Advanced Python, Jax, Generative neural network, diffusion model, etc., (ii) Classic machine learning papers, and (iii) Applications of machine learning to physical sciences.
- **Jun 29, 2023:** Lecture on 'Reinforcement Learning' as part of the course 'Machine Learning in Physics', Course instructor: Prof. Florian Marquardt.
- **2021 Winter:** Teaching assistant for the course 'Quantum Engineering – Simulation and Design' (A227) at Okinawa Institute of Science and Technology (OIST), Course instructor: Prof. Jason Twamley.
- **2019 Winter:** Teaching Assistant for Theoretical Condensed Matter Physics (A222) at Okinawa Institute of Science and Technology (OIST), Course instructor: Prof. Fabian Pauly.
- **February 18 - March 4, 2019: Skill Pill:** A series of seminars on classical and ab initio Molecular Simulations at Okinawa Institute of Science and Technology (OIST). The total duration of the course was 6 hours.
- **2015 – 2017:** Teaching Assistant for C-programming and numerical physics programming courses for M.Sc. and B.Tech students at IIT Guwahati.
- **2014 – 2015:** Teaching Assistant for various General Physics laboratories for B.Tech and M.Sc. students at IIT Guwahati.
- **2008 – 2013:** Worked as a tutor of Physics, Higher Secondary Curriculum, in a few coaching centers in Guwahati, Assam during B.Sc. and M.Sc. years.

STUDENT GUIDED IN RESEARCH PROJECTS DURING MY PH.D. AND POST-DOCS

- **2020:** Mr. Soham Mukherjee, Bachelor project, Shoolini University. Main supervisor: Dr. Gurjot Kour.
- **2019:** Mr. Simon Kothe, Intern, Topic: Density functional perturbation theory, Okinawa Institute of Science and Technology (OIST) Graduate University. Main supervisor: Prof. Fabian Pauly.
- **2017:** Mr. Suresh Kumar BVV (130121009), B.Tech.; Topic: Molecular Dynamics studies of NaCl dissociation in water, IIT Guwahati. Main supervisor: Prof. Padma Kumar Padamanabhan.
- **2017:** Mr. Koushik Naskar (152121018), M.Sc., Topic: Molecular Dynamics studies of NaCl solubility in water, IIT Guwahati. Main supervisor: Prof. Padma Kumar Padamanabhan.

CONFERENCES & WORKSHOPS

- **2024, Oct 08 - Oct 11:** Munich Quantum Valley Annual Meeting, Eichstätt, Germany. Poster: Fault-tolerant Quantum Error Correction with Reinforcement Learning.
- **2024, May 06 - May 08:** Intensive Course on Machine Learning: From Basics to Advanced Concepts. Organized within the QuCoLiMa research network and IMPRS-PL at the Max Planck Institute for the Science of Light, Erlangen, Germany. Topic: Machine learning for quantum control.
- **2024, Mar 17 - Mar 22:** DPG Spring March Meeting 2024, Technische Universität Berlin, Germany. Talk: Accurate Quantum Feedback Control via Conditional State Tomography with Reinforcement Learning.
- **2024, Mar 02 - Mar 08:** APS March Meeting 2024, Minneapolis, United States. Talk: Accurate real-time feedback quantum control with reinforcement learning.
- **2023, Sep 26 - Sep 28:** Munich Quantum Valley Annual Meeting, Eichstätt, Germany. Poster: Gottesman-Kitaev-Preskill quantum error correction with non-Markovian feedback.
- **2023, Sep 5 - Sep 7:** Frontiers of Neuromorphic Computing, Max Planck Institute for the Science of Light, Germany.
- **2023, Aug 2:** FAU Quantum Theory Summer Symposium 2023, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU). Topic: Model-based Reinforcement Learning for Feedback-control of Quantum System.
- **2023, June 14:** MQV K8 Consortia (Hardware adapted theory) internal meeting under Munich Quantum Valley Quantum Computing Initiative, Max Planck Institute of Quantum Optics Garching, Germany.
- **2023, May 2:** Discussion meeting on Theoretical Quantum Computing (Consortia K4 Munich Quantum Valley Quantum Computing Initiative), Max Planck Institute of Quantum Optics Garching, Germany.
- **2023, Feb 14 - Feb 16:** Quantum Machine Learning - Integrating Hardware and Software Developments, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) and Max Planck Institute for Science of Light, Germany.
- **2022, Nov 29, 2022: Invited offline talk,** Max Planck Institute for Science of Light and Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany. Topic: Reinforcement learning for quantum control.
- **2022, Jul 19, 2022: Invited Zoom talk,** Prof. Florian Marquardt group at Max Planck Institute for Science of Light, Erlangen, Germany. Topic: Measurement-based feedback control, Quantum error correction, and Deep reinforcement learning for closed and open loop control.
- **2022, Aug 18 - 24: Poster Presentation,** The 29th International Conference on Low Temperature Physics, LT29, Sapporo, Japan. Topic: MBE-CQEC: A new method for continuous quantum error correction.
- **2022, Apr. 7: Invited Talk,** Macroscopic Quantum Machines Seminar, Okinawa Institute of Science and Technology Graduate University, Japan, Topic: Measurement based estimator scheme for continuous quantum error correction.

- **2019, Nov. 18 - 22: Poster Presentation**, International School and Symposium on Nanoscale Transport and phoTonics 2019, NTT Atsugi R&D Center, Japan. Topic: Ultra-fast Hot Carrier Relaxation Dynamics in 2D Materials.
- **2018, Jan 28: Invited Talk Workshop**, Basics of PARAM-ISHAN, Indian Institute of Technology Guwahati, Assam, India-781039. Topic: Working with ab initio molecular dynamics.
- **2018, Mar. 16–18: Oral Presentation**, REFLUX-201, IIT Guwahati, Assam-781039, India. Topic: Ab Initio Molecular Dynamics Studies of Waterborne Selenium Species.
- **2017, Oct. 31 – Dec. 1: Resource person**(invited) for hands-on-session, Atomistic Computer Simulation Techniques (work- shop), Assam University, Silchar, India. Topic: A Simple Fortran 90 Program for Argon; Visualization and Analysis using VMD.
- **2017, Dec. 7 – 10: Poster Presentation**, Recent Advances in Modelling Rare Events (RARE), Jointly organized by University of Maryland, Columbia University and IIT Kanpur, Agra, India. Topic: AIMD Studies of Waterborne Selenium Species.
- **2017, Mar. 12: Oral Presentation**, Department Day, Physics, IIT Guwahati, Assam-781039, India. Topic: Ab Initio Atomistic Simulation Techniques and Applications.
- **2017, Jan. 7 – 11: Poster Presentation**, 5th Symposium on Advanced Biological Inorganic Chemistry (SABIC), jointly organized by IACS, Kolkata and TIFR, Mumbai, Kolkata, India. Topic: Ab Initio Molecular Dynamics Studies of Waterborne Se Species.
- **2016, Mar. 17 – 20: Poster Presentation**, Research Conclave, IIT Guwahati, Assam-781039, India. Topic: First Principle Molecular Dynamics Studies of Various Selenium Species in Aqueous Environments.
- **2015, Dec. 21 – Dec. 24: Instructor** for hands-on-session, National Workshop on Atomistic Simulation Techniques, IIT Guwahati, Assam-781039, India. Topic: Writing a Basic Molecular Dynamics Code in Fortran-90; Visualization using VMD.
- **2015, Dec. 2 – 5: Poster Presentation**, XXVII IUPAP Conference on Computational Physics (CCP-2015), IIT Guwahati, Assam-781039, India. Topic: Ab Initio Molecular Dynamics Studies of Selenic Acid in Water.
- **2014, Nov. 24 – Dec. 13: School and Seminar Presentation**, DST-SERB School on Density Functional Theory and Beyond: Computational Material Science and Material Design, Maharaja Sayajirao University of Boroda, Vadodara, India. Topic: Basics of Car-Parrinello Molecular Dynamics.

JOURNAL REVIEW/EDITORIAL WORKS

- **Journals reviewer for:** Quantum, Physical Review A, Physical Review B, Applied Physics B, PRX quantum, Scientific Reports, APL Machine Learning, Physical Review Applied.
- **Editor for:** Special issue Guest Editor for “Quantum Control and Machine Learning in Quantum Technology”, in the journal of Mathematics (ISSN 2227-7390) to be published by MDPI publication Switzerland.

MEMBERSHIP

- Life member of Physics Academy of the North East (PANE).

ORGANIZATIONAL ACTIVITIES

- **2024, Nov. 5 - Nov. 8:** Organizer of the ‘2nd Workshop on Machine Learning for Quantum Technology’, Max Planck Institute for the Science of Light, Erlangen, Germany.

- **2024, May 6 - May 8:** Workshop instructor for ‘Intensive Course on Machine Learning: From Basics to Advanced Concepts’, on the topic of ‘Applications of machine learning for quantum control tasks, organized within the QuCoLiMa research network, at the Max Planck Institute for the Science of Light, Erlangen, Germany.
- **2023, Jan. - 2024, Mar.:** Organizer of the weekly discussion club “Machine Learning Discussion Group” at the Max Planck Institute for the Science of Light, Erlangen, Germany.

QUICK SUMMARY OF RESEARCH EXPERIENCE

At Max Planck Institute for the Science of Light & University of Erlangen, Germany

- **Projects:** (a) No-collapse accurate measurement-based feedback control with conditional state tomography; (b) Accurate quantum parameter estimation with continuous observation; (c) Non-Markovian feedback for optimized quantum error correction (QEC); (d) RL for quantum computing experiments (ongoing research).
- **Techniques:** Machine learning (ML), Reinforcement learning (RL).
- **Accomplishments:** Measurement noise can hamper the effectiveness of measurement-based feedback control (MBFC). Even when using an RL controller, this constraint remains. Moreover, the training period for the RL agent is typically lengthy for MBFC, and the accuracy of learning is often sub-optimal. We have introduced a protocol that can precisely estimate the noise-free measurement signals including the full density matrix, based on which MBFC protocols can be designed. In case of the RL agent, this makes the training process efficient both in terms of both speed and

Precise quantum parameter estimation (QPE) is important for quantum sensing and developing optimal quantum control protocols. We have proposed a scheme for accurate QPE, an otherwise difficult task given various noise sources and the complexity associated with quantum measurements. In contrast to previous studies, our approach utilizes continuous quantum measurements and can estimate unknown system parameters that affect the dynamics, from a single quantum trajectory of an experiment, despite the presence of measurement noise and quantum backaction effects, which we demonstrate for QPE of frequency, decoherence rates and the force sensing of a levitating nanoparticle.

Current measurement-based quantum QEC techniques using real-time feedback are unable to provide an optimal non-Markovian strategy. We introduced a method for integrating a recurrent neural network into measurement-based QEC protocols. The resulting strategy is non-Markovian and depends on the full sequence of measurements, which the network uses to build an internal representation of the unknown quantum state and provide the optimal strategy. We illustrate its application to the error correction of the Gottesman-Kitaev-Preskill (GKP) code, extending the lifetime of the logical qubit by a factor of more than 2 compared to the best known protocol.

In some ongoing works, we have been exploring the potential of using RL for quantum computing experiments that includes the possibility of using RL to discover fault-tolerant QEC circuits.

At Okinawa Institute of Science and Technology (OIST) Graduate University, Japan

- **Projects:** (a) Phonon-assisted carrier cooling in graphene; (b) Measurement-Based Feedback Quantum Control with reinforcement learning (RL); (c) Measurement-based estimator scheme for continuous quantum error correction (QEC); (d) Open-loop control for motional cooling with RL.
- **Techniques:** RL, Density Functional Theory (DFT).
- **Accomplishments:** DFT is used to compute the electron-phonon interaction in graphene and *h*-BN/graphene heterostructure, and the Boltzmann transport equation is employed to investigate how phonons assist in cooling

electrons and holes, offering a detailed insight into the mechanisms involved in the cooling of carriers in these 2D materials.

RL is used to control the dynamics of a quantum particle within a nonlinear double-well potential with measurement-based feedback. We focus on the important problem of preparing the ground state of it, which is a non-classical cat state, using solely real-time noisy measurement records. We demonstrate for the first time that RL can be beneficial in discovering real-time controls for complex systems that undergo continuous quantum measurement.

Our proposed method for QEC with continuous quantum measurement uses a real-time estimator to estimate noiseless syndromes in a QEC repetition code and employ accurate feedback for error correction. This method of QEC is highly effective for small QEC codes, enabling the preservation of the logical state for duration significantly longer than the lifetimes of the physical qubits. As a result, it exceeds the break-even point by substantial margins.

We showcase the use of RL for open-loop control to discover short pulse controls for motional cooling of bipartite and tripartite systems. Although conventional sideband cooling methods do not work beyond the well-known rotating-wave approximation (RWA) regimes, our proposed RL scheme can be applied beyond the RWA regimes.

At Indian Institute of Technology (IIT) Guwahati, India

- **Projects:** Ab-initio molecular dynamics (AIMD) investigation waterborne species (quantum mechanical simulation of materials).
- **Techniques:** Molecular Dynamics (MD), Ab-Initio MD (AIMD), Density Functional Theory (DFT).
- **Accomplishments:** These investigations aimed to comprehend the microscopic details of the solvation process of the waterborne species - selenium, arsenic, phosphorous, and sulfur. Through the utilization of costly AIMD simulations, we have explored a range of structural, dynamical, and spectroscopic characteristics of these species in their typical forms found under aqueous conditions. Acquiring such an understanding of microscopic dynamics through experiments is typically challenging and can only be understood from quantum mechanical simulations.

LIST OF REFEREES

- **Prof. Gerard Milburn**
Emeritus Professor, School of Mathematics and Physics, University of Queensland, Australia, and Sussex Center for Quantum Technologies, University of Sussex, United Kingdom.
Email: g.milburn@uq.edu.au,
Homepage: <https://smp.uq.edu.au/profile/194/gerard-milburn>,
<https://www.sussex.ac.uk/research/centres/sussex-centre-for-quantum-technologies/people>,
Google Scholar: <https://scholar.google.com.au/citations?user=i8Ss478AAAAJ&hl=en>
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- **Prof. Florian Marquardt**
Director and Professor, Max Planck Institute for the Science of Light, and Friedrich-Alexander-Universität Erlangen-Nürnberg (University of Erlangen), Erlangen, Germany
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- **Prof. Padma Kumar Padmanabhan**

Professor of Physics, Indian Institute of Technology Guwahati, Assam, India,

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Google Scholar: <https://scholar.google.co.in/citations?user=QzrDCi4AAAAAJ&hl=en>

Phone: 0361-258-2718

- **Prof. Fabian Pauly**

Professor and Chair, Theoretical Physics I, University of Augsburg, Germany,

Email: fabian.pauly@physik.uni-augsburg.de,

Homepage: <https://www.uni-augsburg.de/en/fakultaet/mntf/physik/groups/theo1/team/fabian-pauly>,

Google Scholar: <https://scholar.google.de/citations?user=EdAgwnMAAAAJ&hl=en>

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- **Prof. Jason Twamley**

Professor, Okinawa Institute of Science and Technology Graduate University, Okinawa, Japan,

Email: jason.twamley@oist.jp,

Homepage: <https://groups.oist.jp/qmech>,

Google Scholar: <https://scholar.google.co.in/citations?user=RmYzDu4AAAAAJ&hl=en>

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