Subhayan Sahu

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I am a fifth year graduate student at the Condensed Matter Theory Center in University of Maryland. I am interested in quantum information and condensed matter physics.

Education

Since Aug, 2017 **University of Maryland, College Park**
PhD candidate, Department of Physics | GPA **4.0/4.0**
Advisor: Dr. Brian Swingle

2013-17 **Indian Institute of Science, Bangalore**
Bachelor of Science (Research)
Major: Physics | CGPA **7.7/8.0** | Graduated top of class

Preprints / Publications

*Equal contribution

8. Efficient tensor network simulation of quantum many-body physics on sparse graphs
Subhayan Sahu, Brian Swingle. *ArXiv:2206.04701*.

7. Entanglement Phases in large-N hybrid Brownian circuits with long-range couplings
Subhayan Sahu, Shao-Kai Jian*, Gregory Bentsen, Brian Swingle.* *ArXiv:2109.00013*.

6. Measurement-induced purification in large-N hybrid Brownian circuits
Gregory Bentsen, Subhayan Sahu*, Brian Swingle.* *Phys. Rev. B 104, 094304 (2021)*, *ArXiv:2104.07688*.

5. Information scrambling at finite temperature in local quantum systems
Subhayan Sahu, Brian Swingle. *Phys. Rev. B 102, 184303 (2020)*, **Editors' Suggestion**, *ArXiv:2005.10814*.

4. Many body localization due to correlated disorder in Fock space
Soumi Ghosh, Atithi Acharya, Subhayan Sahu, Subroto Mukerjee. *Phys. Rev. B 99, 165131 (2019)*, *ArXiv:1901.04384*.

3. Scrambling dynamics across a thermalization-localization quantum phase transition
Subhayan Sahu, Shenglong Xu, Brian Swingle. *Phys. Rev. Lett. 123, 165902 (2019)*, *ArXiv:1807.06086*.

2. The lengthening pendulum: Adiabatic invariance and bursting solutions
Subhayan Sahu, Shriya Pai, Naren Manjunath, Janaki Balakrishnan . *Physics Open, Volume 7, 2021*.

1. Maximal entanglement and state transfer using Arthurs-Kelly interaction for qubits
Subhayan Sahu, S.M. Roy. *Eur. Phys. J. D (2018) 72: 211*, *ArXiv:1612.03405*.

Talks and Posters

*Invited talks

5. Tensor networks on sparse graphs

    - CMTC graduate student symposium, *Jun 2022, University of Maryland*

4. Large-N solvable models of measurement-induced criticality

    - MPIPKS conference: Probing Complex Quantum Dynamics (Poster), *Oct 2021, MPIPKS*
    - JQI/QuICS/CMTC seminar, *Oct 2021, University of Maryland*
    * Invited seminar at Perimeter Institute, *Nov 2021, Perimeter Institute*

3. Measurement-induced purification in large-N hybrid Brownian circuits

    - APS March Meeting 2021 (Contributed talk), *Mar 2021, virtual*
    - JQI/QuICS/CMTC seminar, *April 2021, University of Maryland*

2. Quantum Information Scrambling in gapped local systems at finite temperature

    - PhD Candidacy talk, *Jun 2020, CMTC, University of Maryland*
    - APS March Meeting 2020 (Contributed talk), *Mar 2020, Denver (cancelled)*
    * Indian Institute of Science Physics seminar, *Jan 2020, Indian Institute of Science*

1. Scrambling dynamics across a thermalization-localization quantum phase transition

    - Les Houches Summer School (Poster), *Aug 2019, Ecole de Physique des Houches*
    - JQI/QuICS/CMTC seminar, *March 2019, University of Maryland*
    - APS March Meeting 2019 (Contributed talk), *March 2019, Boston*

Schools and Conferences

Oct 2021	**PROTOC21, MPIPKS**, Conference on 'Probing Complex Quantum Dynamics through Out-of-time-ordered Correlators'
Mar 2021	**APS March Meeting, online**
Aug 2020	**Online Ultra-Quantum Matter Summer School**
Aug 2019	**Les Houches Summer School**, Ecole des Physique des Houches. Topic: Dynamics and Disorder in Quantum Many Body Systems far from Equilibrium
Mar 2019	**APS March Meeting, Boston, USA**
May 2018	Quantum Leaps: Quantum information in quantum many body physics, Columbia University
Jul 2017	**Bangalore School of Statistical Physics VIII**
Aug 2014	**Asian Science Camp (2014)**: Part of Indian delegate to the camp held in NTU, Singapore.
Jun 2014	**NIUS Physics Camp (2014)**, held at HBCSE, TIFR, Mumbai.
Dec 2012	**Vijyoshi Camp (2012)**, held at IISc, Bangalore.

Academic Highlights

2021	**Best TA award** from the Department of Physics, University of Maryland, for Spring and Fall '21.
2017-19	**Dean's fellowship** from the University of Maryland, College Park
2017	Graduated top of class of Physics majors; received **Institute Gold medal for Physics** from Indian Institute of Science
2016	DAAD WISE Fellowship: Recipient of the DAAD scholarship for 3 month internship in Universität Siegen, Germany
2012-17	Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship: scholarship awarded by the Department of Science and Technology, Government of India
2014	Participated in Asian Science Camp, as part of the Indian delegate of 20 students

Teaching

Fall '21	TA for Undergraduate Electrodynamics and Sophomore general physics **Best TA Award**
Summer '21	Prepared a packet on Tensor Network for high-schoolers for Girls Talk Math - UMD
Spring '21	TA for Graduate Quantum Mechanics II and Graduate Statistical Mechanics at UMD **Best TA Award**
Fall '17	TA for Phys 260: Vibrations, Waves, Heat, Electricity and Magnetism at UMD

Undergraduate research experience

2016-17 IISc	Many body localization from dynamics in Fock space Advisor: Dr. Subroto Mukerjee (Undergraduate thesis)
2015-16 HBCSE (TIFR)	Maximal entanglement generation in Arthurs Kelly type interaction Advisor: Dr. Shasanka Mohan Roy
2016 Universität Siegen, Germany	Entanglement detection in CV using local orthogonal observables Advisor: Dr. Otfried Gühne Research visit supported by DAAD fellowship.

Skills

Computing Python, Matlab, Julia, Mathematica, LaTeX, basic Shell

Professional Service

Reviewer for SciPost Physics, Phys. Rev. B.