Raghav Govind **JHA**

raghavgjha.net github.com/rgjha +1 519-570-7150 rjha1@perimeterinstitute.ca
227, Perimeter Institute for Theoretical Physics, Waterloo, Ontario N2L 2Y5, Canada
iNSPIRE-HEP, http ://orcid.org/0000-0003-2933-0102
Date of Birth : January 23, 1989 Citizenship : Indian

Employment

2019 -	Postdoctoral Fellow, Perimeter Institute for Theoretical Physics

Education

2013 – 2019	**Ph.D. Physics,** *Syracuse University,* Syracuse, New York, USA Thesis title : Holography, large N, and *supersymmetry* on the lattice GPA : 3.86/4.0
2011 – 2013	**M.Sc. Physics,** *St. Xavier's College & Bose Institute,* Kolkata,India
2010 – 2011	**MS in Nanomaterials,** *UPMC, University of Paris 6,* Paris, France
2007 – 2010	**B.Sc. Physics (Honours),** *St. Stephen's College* Delhi, India

Publications and preprints

1. Three-dimensional super-Yang–Mills theory on the lattice and dual black branes [Phys. Rev. D **102**, 106009 (2020)] [2010.00026]
2. Positive geometries for all scalar theories from twisted intersection theory [Phys. Rev. Research **2**, 033119 (2020)] [2006.15359]
3. Critical analysis of two-dimensional classical XY model [J. Stat. Mech. (2020) 083203] [2004.06314]
4. Thermal phase structure of a supersymmetric matrix model [PoS LATTICE2019 (2020) 069] [2003.01298]
5. Finite N unitary matrix models [2003.00341]
6. Tensor renormalization group study of the non-Abelian Higgs model in two dimensions [Phys. Rev. D **99**, 114507 (2019)] [1901.11443]
7. Lattice quantum gravity with scalar fields [PoS LATTICE2018 (2019) 043] [1810.09946]
8. The properties of D1-branes from lattice super Yang–Mills theory using gauge/gravity duality [PoS LATTICE2018 (2019) 308] [1809.00797]
9. Removal of the trace mode in lattice $\mathcal{N} = 4$ super Yang-Mills theory [Phys. Rev. D **98**, 095017 (2018)] [1808.04735]
10. Nonperturbative study of dynamical SUSY breaking in $\mathcal{N} = (2, 2)$ Yang-Mills [Phys. Rev. D **97**, 054504 (2018)] [1801.00012]
11. Truncation of lattice $\mathcal{N} = 4$ super Yang-Mills [EPJ Web of Conferences 175, 11008 (2018)]
12. Testing the holographic principle using lattice simulations [EPJ Web of Conferences 175, 08004 (2018)] [1710.06398]
13. Testing holography using lattice super-Yang-Mills on a 2-torus [Phys. Rev. D **97**, 086020 (2018)] [1709.07025]

Talks & Posters

Invited Talks/Seminars/Lectures **[9]**

- New tool for old problems - Tensor network approach to spin models and gauge theories (October 14, 2020) [1 hour] at University of Liverpool, UK [Slides(PDF)]
- Tensor Networks : Algorithm & Applications (June 10-11, 2020) - Two lectures lasting 1.5 hours each for CyberTraining Summer School 2020 at Rensselaer Polytechnic Institute, USA [Online due to COVID-19 pandemic] [Lecture 1 & 2]
- Numerical Approaches to Holography (August 28, 2019) [1 hour] at Ashoka University, Haryana, Sonepat, India [Slides(PDF)]
- Numerical Approaches to Holography (August 8, 2019) [1 hour] at Indian Institute of Science Education and Research (IISER) Mohali, India [Slides(PDF)]
- Holographic dualities and tensor renormalization group study of gauge theories (March 11, 2019) [1 hour] at Perimeter Institute, Waterloo, Canada [Video (PIRSA)]
- Supersymmetry breaking and gauge/gravity duality on the lattice (April 6, 2018) [25+5 minutes] at UC Boulder, Colorado, USA [Slides(PDF)]
- Recent results from lattice supersymmetry in $2 \leqslant d < 4$ dimensions (January 31, 2018) [25+5 minutes] at ICTS, Bangalore, India [Video (YouTube)]
- Testing holography through lattice simulations (April 4, 2017) [40+5 minutes] at Yukawa Institute for Theoretical Physics, Kyoto, Japan [Program Webpage]
- Supersymmetry on the lattice (April 17, 2016) [30+5 minutes] at April Meeting 2016 - Salt Lake City, Utah, USA [Slides(PDF)]

Contributed Talks **[2]**

- Testing holographic principle through lattice studies (June 22, 2017) [15+5 minutes] at Lattice 2017, Granada, Spain [Program Webpage]
- Lattice quantum gravity with scalar fields (July 23, 2018) [15+5 minutes] at Lattice 2018, East Lansing, Michigan, USA [Program Webpage]

Posters **[1]**

- The properties of D1-branes from lattice super Yang–Mills theory using gauge/gravity duality at the 36th Annual International Symposium on Lattice Field Theory — 24 July 2018

Teaching Experience (as a TA)

- Recitation Instructor for PHY 216 (General Physics II for Honors and Majors) and grader for PHY 662 (Quantum Mechanics II) — Spring 2019
- Recitation Instructor for PHY 215 (General Physics I for Honors and Majors) and grader for PHY 312 (Relativity & Cosmology) — 2018
- Grader for PHY 424 (Electromagnetism) and PHY 360 (Waves and Oscillations) — Fall 2016
- Recitation Instructor for PHY 212 General Physics II — Spring 2016
- Grader for PHY 641 (Statistical Mechanics) and PHY 731 (Electromagnetic theory) — 2015
- Recitation Instructor for PHY 211 General Physics I — 2014
- Lab Instructor for PHY 101 — 2013

Academic Achievements

- Henry Levinstein Fellowship for Outstanding Senior Graduate Student - Department of Physics, Syracuse University — 2017
- College of Arts and Sciences Fellowship for best performance in introductory Graduate Courses - Department of Physics, Syracuse University — 2014
- CSIR/UGC-NET - Junior Research Fellowship (JRF) by Government of India — March 2013
- Erasmus Mundus Scholarship for pursuing M.S at UPMC, University of Paris VI — 2010
- National Top 25 Students (out of 5153 students) in National Graduate Physics Examination (NGPE) — 2009
- KVPY (Kishore Vaigyanik Protsahan Yojana) Scholarship by Department of Science & Technology, Government of India — 2008

- Merit certificate by University of Delhi (11^{th} in the university out of $\approx$ 1200 students) 2008
- NIUS (National Initiative on Undergraduate Sciences) Fellowship by Tata Institute (TIFR), Mumbai 2008

Computer Skills

C/C++, Python, Julia, Matlab, Mathematica, LaTeX, Gnuplot, and Bash

Professional Services and Grants

- Quantum Fields and Strings Seminar Organizer at Perimeter Institute [January 2020 - March 2021].
- Referee for Physical Review D and Physical Review Letters
- Academic Advising : Three graduates students (combined) each at Syracuse, Perimeter, and IISER Mohali between 2018 - Till Date
- Co-wrote computing grants for USQCD in 2017 and 2018 and was awarded about 12M core-hours on Fermilab's pi0 machine each both years.

Upcoming preprints (work in progress)

1. Phase structure of BMN matrix model at finite couplings [with A.Joseph and D.Schaich]
2. Two-dimensional Ising model in an arbitrary magnetic field - an exact result [Single author]
3. Triad tensor renormalization group approach to 3d O(2) model
4. Scalar bound states in $\mathcal{N} = (2, 2)$ SYM at large $\mathbf{N}$ and finite temperatures [with A. Joseph, D. Schaich, N. Dhindsa]
5. Bootstrapping matrix models with positivity constraints [with R. Ramirez, P. Vieira]
6. Tensor formulation of CP(N-1) model with θ-term [Single author]
7. BKT-like phase transition in frustated two-dimensional XY model [Single author]
8. Parallel software for large $\mathbf{N}$ supersymmetric gauge theories [with D. Schaich, G. Bergner et al.]

References

1. Simon Catterall
   Professor of Physics and Department Associate Chair
   Syracuse University, NY, USA
   smcatter@syr.edu

2. Joel Giedt
   Associate Professor and Associate Department Head
   Rensselaer Polytechnic Institute Troy, NY, USA
   giedtj@rpi.edu

3. David Schaich
   Lecturer in Theoretical Particle Physics, Department of Mathematical Sciences
   University of Liverpool, Liverpool, UK
   david.schaich@liverpool.ac.uk

4. Toby Wiseman
   Professor of Theoretical Physics
   Imperial College, London, UK
   t.wiseman@imperial.ac.uk

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