






Raghav Govind Jha

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 Date of Birth : January 23, 1989 Citizenship : Indian

Employment

September 2019	Postdoctoral Fellow, Perimeter Institute for Theoretical Physics, Canada
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Education

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

Publications and preprints

Citations : 100+, h-index : 7

1. Tensor renormalization group study of the 3d $O(2)$ model [[2105.08066](#)]
2. Three-dimensional super-Yang–Mills theory on the lattice and dual black branes [Phys. Rev. D 102, 106009 (2020)] [[2010.00026](#)]
3. Positive geometries for all scalar theories from twisted intersection theory [Phys. Rev. Research 2, 033119 (2020)] [[2006.15359](#)]
4. Critical analysis of two-dimensional classical XY model [J. Stat. Mech. (2020) 083203] [[2004.06314](#)]
5. Thermal phase structure of a supersymmetric matrix model [PoS LATTICE2019 (2020) 069] [[2003.01298](#)]
6. Finite N unitary matrix models [[2003.00341](#)]
7. Tensor renormalization group study of the non-Abelian Higgs model in two dimensions [Phys. Rev. D 99, 114507 (2019)] [[1901.11443](#)]
8. Lattice quantum gravity with scalar fields [PoS LATTICE2018 (2019) 043] [[1810.09946](#)]
9. The properties of D1-branes from lattice super Yang–Mills theory using gauge/gravity duality [PoS LATTICE2018 (2019) 308] [[1809.00797](#)]
10. Removal of the trace mode in lattice $\mathcal{N} = 4$ super Yang–Mills theory [Phys. Rev. D 98, 095017 (2018)] [[1808.04735](#)]
11. Nonperturbative study of dynamical SUSY breaking in $\mathcal{N} = (2, 2)$ Yang–Mills [Phys. Rev. D 97, 054504 (2018)] [[1801.00012](#)]
12. Truncation of lattice $\mathcal{N} = 4$ super Yang–Mills [EPJ Web of Conferences 175, 11008 (2018)]
13. Testing the holographic principle using lattice simulations [EPJ Web of Conferences 175, 08004 (2018)] [[1710.06398](#)]

Talks & Posters

Invited Talks/Seminars/School Lectures [13]

- › Solving matrix models at large and finite N (June 28 and 29, 2021) - Two lectures for Summer School 2021 at Rensselaer Polytechnic Institute, USA [Online due to COVID-19 pandemic] [[Lecture 1 & 2](#)]
- › Holographic gauge theories on the lattice at (June 23, 2021) [Online] at Dublin Institute for Advanced Studies, Dublin [[Slides\(PDF\)](#)] [[Video \(YouTube\)](#)]
- › Old and new methods for new and old problems in Physics (March 8, 2021) [Online] at Indian Institute of Technology (IIT) Madras [[Slides\(PDF\)](#)]
- › Probing holographic dualities with lattice supersymmetric Yang-Mills theories (February 25, 2021) [Online] at Massachusetts Institute of Technology [[Slides\(PDF\)](#)] [[Video \(YouTube\)](#)]
- › New tool for old problems - Tensor network approach to spin models and gauge theories (October 14, 2020) [Online] at University of Liverpool, UK [[Slides\(PDF\)](#)]
- › Tensor Networks : Algorithm & Applications (June 10 and 11, 2020) - Two lectures 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) at Ashoka University, Haryana, Sonapat, India [[Slides\(PDF\)](#)]
- › Numerical Approaches to Holography (August 8, 2019) at Indian Institute of Science Education and Research (IISER) Mohali, India
- › Holographic dualities and tensor renormalization group study of gauge theories (March 11, 2019) at Perimeter Institute, Waterloo, Canada [[Video \(PIRSA\)](#)]
- › Supersymmetry breaking and gauge/gravity duality on the lattice (April 6, 2018) at UC Boulder, Colorado, USA [[Slides\(PDF\)](#)]
- › Recent results from lattice supersymmetry in $2 \leq d < 4$ dimensions (January 31, 2018) at ICTS, Bangalore, India [[Video \(YouTube\)](#)]
- › Testing holography through lattice simulations (April 4, 2017) at Yukawa Institute for Theoretical Physics, Kyoto, Japan [[PDF](#)]
- › Supersymmetry on the lattice (April 17, 2016) at April Meeting 2016 - Salt Lake City, Utah, USA [[Slides\(PDF\)](#)]

Contributed Talks [2]

- › Testing holographic principle through lattice studies (June 22, 2017) at Lattice 2017, Granada, Spain
- › Lattice quantum gravity with scalar fields (July 23, 2018) at Lattice 2018, East Lansing, Michigan, USA

Posters [1]

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

Teaching Experience

- › 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

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- › Recitation Instructor for PHY 211 General Physics I 2014
 - › Lab Instructor for General PHY 101 Fall 2013

Academic Achievements

- › Henry Levinstein Fellowship for Outstanding Senior Graduate Student - Department of Physics, Syracuse University [USD 2000] 2017
- › College of Arts and Sciences Fellowship for best performance in introductory Graduate Courses - Syracuse University [USD 1700] 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 [EUR 12000] 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 [about USD 3500 in two years] 2008
- › Merit certificate by University of Delhi (11th in the university out of ≈ 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 , 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
- › Co-wrote USQCD computing grants in 2017 and 2018 and was awarded $\approx 12\text{M}$ core-hours on Fermilab pi0 machine each year.

Work in progress (excluding Conference proceedings)

- › Phase structure of BMN matrix model at finite couplings [with A. Joseph and D. Schaich]
- › Towards exact result of two-dimensional Ising model in a magnetic field [single author]
- › Scalar bound states in $\mathcal{N} = (2, 2)$ SYM at large N and finite temperatures [with A. Joseph, D. Schaich, N. Dhindsa]
- › Improved tensor contraction for three-dimensional spin models [single author]
- › Parallel software for large N supersymmetric gauge theories [with D. Schaich et al.]

References

1. Simon Catterall (Thesis advisor)
Professor of Physics and Department Associate Chair
Syracuse University, NY, USA
 smcatter@syr.edu
2. A. P. Balachandran
Emeritus Professor of Physics
Syracuse University, NY, USA
 balachandran38@gmail.com

3. Joel Giedt

Associate Professor and Associate Department Head

Rensselaer Polytechnic Institute Troy, NY, USA

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4. David Schaich

Lecturer in Theoretical Particle Physics, Department of Mathematical Sciences

University of Liverpool, Liverpool, UK

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5. Toby Wiseman

Professor of Theoretical Physics

Imperial College, London, UK

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