







Raghav Govind JHA

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 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 **[10]**

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- > Probing holographic dualities with lattice supersymmetric Yang-Mills theories (February 25, 2021) [Online] at Massachusetts Institute of Technology [[Slides\(PDF\)](#)]
 - > 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, Sonapat, India [[Slides\(PDF\)](#)]
 - > Numerical Approaches to Holography (August 8, 2019) [1 hour] at Indian Institute of Science Education and Research (IISER) Mohali, India
 - > 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 $2 \leq d < 4$ 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 [[PDF](#)]
 - > 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
- > Lattice quantum gravity with scalar fields (July 23, 2018) [15+5 minutes] 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 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

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- > KVPY (Kishore Vaigyanik Protsahan Yojana) Scholarship by Department of Science & Technology, Government of India 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 , 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. Triad tensor renormalization group approach to 3d $O(2)$ model
3. Scalar bound states in $\mathcal{N} = (2, 2)$ SYM at large N and finite temperatures [with A. Joseph, D. Schaich, N. Dhindsa]
4. Tensor formulation of $CP(N-1)$ model with θ -term [Single author]
5. BKT-like phase transition in frustated two-dimensional XY model [Single author]
6. Parallel software for large N supersymmetric gauge theories [with D. Schaich, G. Bergner et al.]

References

Available on request.

Last updated: 25 February 2021