







# Raghav Govind Jha

 [rgjha.github.io](https://github.com/rgjha)  [github.com/rgjha](https://github.com/rgjha)  +1 519-570-7150  [rjha1@perimeterinstitute.ca](mailto:rjha1@perimeterinstitute.ca)  
 227, Perimeter Institute for Theoretical Physics, Waterloo, Ontario N2L 2Y5, Canada  
[iNSPIRE-HEP](https://inspirehep.net/literature/2000000), <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<br>Thesis : <a href="#">Holography, large N, and supersymmetry on the lattice</a> |
| 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

---

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](#)]
  14. 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 [12]

- Holographic gauge theories on the lattice at (June 23, 2021) [Online] at Dublin Institute for Advanced Studies, Dublin [[Slides\(PDF\)](#)]
- 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] [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 Cyber-Training 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 36<sup>th</sup> 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 General PHY 101 Fall 2013

## Academic Achievements

---

- › Henry Levisstein 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 (11<sup>th</sup> 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, L<sup>A</sup>T<sub>E</sub>X, 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
- › Co-wrote USQCD computing grants in 2017 and 2018 and was awarded about 12M core-hours on Fermilab pi0 machine both years.

## Upcoming preprints (work in progress)

---

- › Phase structure of BMN matrix model at finite couplings [with A. Joseph and D. Schaich]
- › Scalar bound states in  $\mathcal{N} = (2, 2)$  SYM at large  $N$  and finite temperatures [with A. Joseph, D. Schaich, N. Dhindsa]
- › Parallel software for large  $N$  supersymmetric gauge theories [with D. Schaich et al.]

## References

---

Available on request.

---

Last updated: 23 June 2021