Vasudev Shyam

Curriculum Vitae

Current Position

2021-present **Branco Weiss Fellow**, Branco Weiss Fellowship, Society and Science, administered by ETH Zurich

2020-2023 **Postdoctoral Fellow**, Stanford Institute for Theoretical Physics

Education

2015-2020 **PhD,** Perimeter Institute for Theoretical Physics and University of Waterloo

Supervisor: Lee Smolin

Thesis Title: The Quantum Gravity Renormalization Group

2014-2015 **Perimeter Scholar,** Perimeter Scholars International, Perimeter Institute for Theoretical Physics.

Note: Due to exceptional circumstances, I was admitted to the PSI program without any prior formal degree.

Internships

2020 Resident at team Quantum, X, Google LLC

Project Title: Simulating Matrix Black Holes

Role: Simulated variations of the BFSS model at large N by leveraging Google's proprietary accelerated hardware, designed originally for AI applications.

Awards

2021-2026 Branco Weiss Fellowship, Society in Science, Administered by ETH Zurich

2020 John Brodie Memorial Prize, Perimeter Institute

2017 & 2016 Godsoe Family Foundation Exceptional Emerging Talent Award

2014 Brad and Kathy Marsland Honorary PSI Scholarship Award

Outreach

2022 onwards Host of "Theoretically Podcasting" ▷

2020 Host of "Talking Physics" Podcast ▷

Research Interests

- Extensions of holography to bulk geometries with positive cosmological constant

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- Solvable irrelevant operator deformations of conformal field theories
- Statistical mechanics of stochastic optimization in deep neural networks
- The supersymmetric theory of stochastic dynamics

Publications

See Google Scholar ▷ or Inspire ▷

Media Mentions

- "Navigating chaos: how two young researchers are charting the unknown" – Inside the Perimeter, 2020,"
- "From PIRSA to Perimeter" — Perimeter Institute Annual Report, 2018-2019

Programming Languages

Moderate proficiency	Python, JAX, Mathematica
Basic proficiency	C++, C, Java, HTML

Talks

- "dS_3 Entropy from Cutoff Holography", Berkeley String Seminar, 2021
- "Entropy of the de Sitter horizon from finite radius holography", TIFR Quantum Spacetime Seminar, 2021
- "Cutoff Holography and Radial Quantization of Gravity in 2+1 dimensions" – It from Qubit group meeting, Stanford Institute for Theoretical Physics, 2020
- "Conformal Boundary Conditions and $T\bar{T}$" – $T\bar{T}$ group meeting, Stanford Institute for Theoretical Physics, 2020
- " Entanglement Entropy and Finite Cutoff Holography" – University of California, Davis, 2020
- "Holography at finite radius" – Black Hole Initiative, Harvard, 2019
- "Entanglement entropy in finite cutoff holography"- University of California, Berkeley, 2019
- "The $T\bar{T}$ flow and diffeomorphism invariance"-Stanford Institute for Theoretical Physics, 2019
- "Entanglement Entropy and $T\bar{T}$"-Quantum Information and String Theory, Yukawa Institute for Theoretical Physics, Kyoto, 2019
- "The local Callan Symanzik equation in T2 deformed theories" – TTbar and Other Solvable Deformations of Quantum Field Theories, Simons Centre for Geometry and Physics, Stony Brook, 2019
- "The $T\bar{T}$ flow and finite radius holography" – Perimeter Institute Quantum matter day, 2018
- "Holographic Entanglement Entropy in Finite Radius AdS/CFT" – Indian Institute of Science, 2018

- "Holography at finite radius"- Quantum Gravity seminar at Perimeter Institute, 2018
- "Covariance and Irrelevance in the Holographic Renormalization Group" – Raman Research Institute, 2018
- "What kind of RG is GR?" – QG group meeting, Okinawa Institute of Science and Technology, 2017
- "What kind of RG is GR?" – Perimeter Institute Quantum matter day, 2017
- "Holography from the hypersurface deformation algebra" – Perimeter Institute Quantum Gravity day, 2017
- "General Covariance from the Quantum Renormalization Group" – Sapienza University, Rome, 2017
- "The Emergence of Many Fingered Time From The Quantum Renormalisation Group" – Shapes 2016, Nijmegen, 2017

Teaching

- Co-supervisor for Perimeter Scholars International winter school project leading to J. High Energ. Phys. 2020, 6 (2020)
- Teaching Assistant for Quantum Field Theory III- Perimeter Scholars International 2018/2019
- Teaching Assistant for Quantum Field Theory III- Perimeter Scholars International 2017/2018
- Teaching Assistant for Standard Model Review- Perimeter Scholars International 2016/2017
- Teaching Assistant for Cosmology Review- Perimeter Scholars International 2015/2016