

Tamanjyot Singh

(Official documents: Tamanjyot)

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Research Interests

Relativistic Astrophysics | Black Hole Spin | Tidal Disruption Events | Gravitational Waves (GWs)
Spin Precession in Binary Black Holes | Gravitational Lensing of GWs

Education

Ph.D.	The University of Texas at Dallas Physics Thesis: <i>The Black Hole Ballet</i> : Spin and precession effects on gravitational waves and tidal disruption events Advisor: Dr. Michael Kesden	Richardson, TX, USA January 2021 - Ongoing (expected April 2026)
M.S.	The University of Texas at Dallas Physics GPA: 3.93/4.0	Richardson, TX, USA January 2021 - December 2023
B.Tech.	Punjab Engineering College (Deemed to be University) Aerospace Engineering with minor in Mathematics GPA: 9.2/10.0, Rank 2	Chandigarh, India August 2016 - June 2020

Experience

Research assistant <i>Department of Physics, The University of Texas at Dallas</i> Precession and Nutation in Gravitational Waves: Investigating spin-orbit and spin-spin coupling in gravitational-wave signals from binary black holes. Lensing vs Precession in Gravitational Waves: Distinguishing between a lensed and a precessing gravitational-wave signal. Tidal Disruption Events: Explored inclination biases of stellar disruptions for spinning supermassive black holes.	Richardson, TX, USA May 2022 - Ongoing
Teaching assistant <i>Department of Physics, The University of Texas at Dallas</i> Physics Laboratory I - Mechanics: Introductory physics laboratory course.	Richardson, TX, USA January 2021 - May 2022
Research Intern <i>Combustion Research Laboratory, Indian Institute of Technology, Bombay</i> Combustion characteristics and effect of hydrogen content on syngas-air mixtures: Formulated a machine learning based empirical model to predict laminar burning velocities of syngas-air mixtures. Contributed to: Varghese and Kumar 2020	Mumbai, India January 2019 - April 2019
Indian Air Force (IAF) Intern <i>3rd Base Repair Depot (3BRD), Air Force Station</i>	Chandigarh, India June 2018

Publications

Published:

Tamanjyot Singh , Michael Kesden "Distribution of orbital inclinations for tidal disruption events by Kerr black holes" <i>Phys. Rev. D</i> 109, 043016, ADS	February 2024
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Submitted:

Tamanjyot Singh, Evangelos Stoikos, Saif Ali, Nathan Steinle, Michael Kesden, and Lindsay King September 2025

"Detecting regular precession using a new gravitational waveform model directly parameterized by both precession amplitude and frequency"

Submitted to *Phys. Rev. D*, arXiv: 2509.10628, [ADS](#) [↗](#)

In preparation:

Tamanjyot Singh, Michael Kesden, and Lindsay King

"Detecting nutation using a new gravitational waveform model: `generic_precession`"

Tien Nguyen[†], **Tamanjyot Singh**[†], Benjamin McCallip, Michael Kesden, and Lindsay King († Co-leads)

"Distinguishing between a lensed and a precessing gravitational wave signal"

Research Presentations

Contributed	Fall meeting 2025, Texas, Arkansas, Oklahoma Section APS ↗ , Texas Christian University, Fort Worth, TX	October 2025
Contributed	Team for EXtragalactic ASTrophysics (TEXAS) – Partnerships in Astronomy & Astrophysics Research and Education (PAARE) Annual Symposium 2025 ↗ , The University of Texas at Dallas, Richardson, TX	April 2025
Contributed	APS Global Physics Summit 2025 ↗ , Anaheim, CA	March 2025
Contributed	Fall meeting 2024, Texas Section APS ↗ , Southern Methodist University, Dallas, TX	October 2024
Invited Visit	Center for Computational Astrophysics, Flatiron Institute, New York City, NY	May 2024
Contributed	APS April meeting 2024 ↗ , Sacramento, CA	April 2024
Contributed	Team for EXtragalactic ASTrophysics (TEXAS) – Partnerships in Astronomy & Astrophysics Research and Education (PAARE) Annual Symposium 2024 ↗ , University of North Texas, Denton, TX	March 2024
Contributed	10th Gulf Coast Gravity Meeting 2024 ↗ , University of Texas, Austin, TX	March 2024
Contributed	International Conference on Gravitation and Cosmology 2023 ↗ , Indian Institute of Technology, Guwahati, Assam, India	December 2023
Contributed	Fall meeting 2023, Texas Section APS ↗ , Angelo State University, San Angelo, TX	October 2023
Contributed	Spring meeting 2023, Texas Section APS ↗ , Texas A&M University, Commerce, TX	March 2023

Awards and Recognitions

NSM Conference Travel Award School of Natural Sciences and Mathematics, The University of Texas at Dallas, TX	March 2025
APS April meeting DGRAV Travel Award Division of Gravitational Physics, APS	April 2024
Margie Renfrow Travel Award Department of Physics, The University of Texas at Dallas, TX	March 2024
Teaching Assistant Award 2022 ↗ Department of Physics, The University of Texas at Dallas, TX	December 2022
PECOSA Sydney Prize (Awarded to 3 out of 700+ students) Punjab Engineering College, Chandigarh	September 2018
1st position in the Mathematics Quiz Punjab State Council for Science and Technology, Chandigarh	September 2016

Mentoring

I have had the pleasure of mentoring with many undergraduate and near-peer mentees over the years:

Austin Crawford	UTD grad student Fall 2024 - Ongoing (<i>Grad Student</i>)
Benjamin McCallip	Summer REU student 2025 (<i>Undergrad student</i>)
Tien Nguyen	PAARE fellow 2023-24 (<i>Post-baccalaureate student</i>)
Maya Basu	Summer REU student 2024 (<i>Undergrad Student</i>)
Tinatin Tsiskaridze	Summer exchange student 2024 (<i>Grad Student</i>) (from Tblisi State University, Georgia)
Niel Shah	Summer REU student 2023 (<i>Undergrad Student</i>)
Deven Linthicum	Summer REU student 2023 (<i>Undergrad Student</i>)
Allison Powell	Summer REU student 2022 (<i>Undergrad Student</i>)

Service and Leadership

Reviewer	Physical reviews D, Monthly Notices of the Royal Astronomical Society
Journal Club Host: Hosted weekly journal club meetings with astrophysics students and faculty across DFW in a joint effort between the University of Texas at Dallas, University of North Texas, Denton, and University of Texas at Arlington.	August 2024 - August 2025
Course Facilitator: Volunteered to teach and translate Punjabi along with hosting biweekly community sessions, fostering an environment for positive outlook on life as Sikhs in the USA.	August 2024 - May 2025
Graduate Students in Physics - Vice President: Representing graduate student interests in the department. Assisting President in maintenance and operations of the organization. <i>Notable:</i> Procured a department-wide Overleaf license.	May 2023 - July 2024
Graduate Students in Physics - Astronomy committee head: Graduate student liaison for all things telescope, hosting star-watch and lunar eclipse parties.	March 2022 - February 2024

Technical skills

- Python: numpy, matplotlib, scipy, PyCBC, astropy, etc. (Developed: [regular_precession](#))
- Other programming languages: C, C++, Matlab
- General: git, $\text{\LaTeX}$, HTML, cluster computing (slurm)

Professional Development

Participant in Prospects in Theoretical Physics 2025 Institute for Advanced Study, Princeton, NJ	July 2025
Participant in Entering Mentoring The University of Texas at Dallas, Richardson, TX	July 2024
Course Certificate for Astro 101 : Black Holes University of Alberta on Coursera.	June 2020
Host for workshop on Gravitational lensing (Undergraduate) Punjab Engineering College, Chandigarh	October 2019
Participant in ASTROWIN , Winter School on Astronomy 2019 Birla Museum, Hyderabad	February 2019
Course Certificate for Particle Physics: an Introduction University of Geneva on Coursera.	July 2018
Course Certificate for Understanding Einstein: The Special Theory of Relativity Stanford University on Coursera.	July 2017