# Shaan Patel

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shaandpatel.github.io

## Education

**University of Texas at Arlington** — Arlington, TX
- Doctoral Candidate in **Physics and Applied Physics** — Aug 2021 – Present
- Master of Science in **Physics** (GPA: 4.00) — May 2025

**Georgia Institute of Technology** — Atlanta, GA
- Bachelor of Science in **Physics**, with Highest Honor — Dec 2019

## Research Experience

***Researcher,* Exoplanets/Exomoons and Habitability at UTA** — Aug 2021 – Present
- Used python to simulate the orbital dynamics of 3 and 4 body systems
- Acquired and visualized F-type planetary data from the literature
- Published 5 papers concerning exoplanets/exomoons and habitability

***Intern,* SuperCDMS Group at SLAC National Accelerator Lab** — Jun 2019 – Aug 2019
- Worked in the Cryogenic Dark Matter Search (CDMS) group testing the wiring and readout card attached to the He-3/He-4 dilution refrigerator
- Connected a signal analyzer to the readout cable and ran tests using different gains in the amplifiers on the readout card
- Gathered phase and magnitude data from these tests and found key phase oscillation problems in the readout card

***Member*, Numerical Relativity Research Group at Georgia Tech** — May 2018 – Dec 2019
- Ran numerical simulations on binary black hole systems to gather gravitational wave data and assist LIGO
- Compiled code on advanced computing clusters using different parameter files and visualized data output

***Group Leader*, Gravitational Waves Astrophysics Project** — Aug 2017 – May 2018
- Led a group of undergrad researchers in simulating and visualizing binary black holes
- Visualizing apparent horizons from black holes using the VisIt software
- Took data sets and created a video of apparent horizons spiraling and merging

## Experience

***Graduate Research Assistant,* UTA** — Jan 2023 – Present
- Ran simulations on orbital stability of exoplanets/moons around F type stars

***Graduate Teaching Assistant,* UTA** — Aug 2021 – Dec 2022
- Taught two 3-hour lab sections for undergrad Physics 2 (E&M)
- Assessed lab reports and held office hours every week

***Analyst*, Investments Committee at GT** — Jan 2017 – Jan 2018
- Participated in one of the largest completely student run portfolios in the country ($1.2 million)
- Put together holistic presentations on companies that the group could potentially invest in

***Finance Intern*, NanoLumens** — Aug 2015 – Apr 2016
- Used financial statements to create comprehensive financial reports for different competitors
- Created a presentation for company executives and employees on mergers and acquisitions and explaining its potential effects on the company

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## Publications/Presentations

**Can Moons Exist around the Habitable-zone Planet K2-18b? (1st Author)** Jul 2025
- Ran 2,400 N-body simulations showing exomoons around K2-18b would be ejected within ~10 Myr due to rapid tidal migration.

**Exomoon/Submoon Orbital Stability Poster Presentation – UTA Discover Symposium** Apr 2025
- Presented a poster based on our paper on 3- and 4-body orbital dynamic simulations

**Orbital Stability of Hierarchical 3- and 4-Body Systems with Inclination (1st Author)** Jan 2025
- Simulated exomoon systems to confirm orbital stability of candidates
- Explored putative submoons to lay theoretical foundation for future observations

**Apparent Diameters of F- to M-type MS Stars as Viewed from HZ Planets (1st Author)** Jan 2025
- Investigated the apparent sizes of host stars from different planet locations

**On the Age and Metallicity of Planet-hosting Triple Stellar Systems** Sep 2024
- Obtained data from the literature on known planet-hosting triple stellar systems

**Statistics and Habitability of F-tpye Star—Planet Systems (1st Author)** Sep 2024
- Investigated known F-type systems with planets to find those that are in the habitable zone
- Analyzed stellar evolution code output to classify stars as main-sequence or not

**F-type Habitability Poster Presentation – UNT/UTD TEXAS Symposium** Mar 2024
- Presented a poster based on our paper on habitability of F-type systems

**Exomoon Stability Presentation – Exoplanet Workshop at UTA** Mar 2023
- Presented current research on exomoon and submoon orbital stability simulations

**An Early Catalog of Planet Hosting Multiple Star Systems of Order Three and Higher** Dec 2022
- Made plots and was co-author on a ApJS paper discussing triple/quadruple star systems

**Chaos Theory and the Stock Market – Non-Linear Dynamics** May 2022
- Wrote a 13-page paper investigating the relation between chaos theory and the financial markets

**Diagnosis of DCRC and 8m Cable Presentation/Paper – SuperCDMS** Aug 2019
- Presented findings from DCRC tests to peers and staff scientists
- Reported on key phase oscillation problems of DCRC in paper

## Scholarships

Zell Miller Scholarship (Full Tuition Coverage at GT, ~$35,000)
GAANN Fellowship ($16,447)
Michael and Wanda Ray Scholarship ($8,000)
Edward and Dorothy Perez Endowed Scholarship ($2,000)

## Skills

**Software**
Python, Linux Command Line, NumPy, pandas, matplotlib, LaTeX
PyTorch, Scikit-learn, Machine Learning Techniques
**Communication**
Presentations, Leading Research Projects, Technical Writing