# Nousha Afshari

5182 Arlington Court, Baton Rouge, LA 70820
Nafsha2@lsu.edu | Phone: (949) 705 9904


## EDUCATION

Louisiana State University
**Doctor of Philosophy, Medical Physics** **Expected: 2026**

California State University of Fullerton
**Bachelor of Science, Physics** **2016**
Graduated Cum Laude GPA: 3.63

## EMPLOYMENT

**Research Assistant**
Louisiana State University, *Baton Rouge, LA* **Jan. 2021 - Present**
- Part of the SpaRTAN physics research lab group under Dr. Jeff Chancellor
- Current project investigates biological radiation damage models

**Teaching Assistant**
Louisiana State University, *Baton Rouge, LA* **Aug. 2020 – Dec. 2020**
- Administered a supplemental learning environment to students' physics course
- Facilitated students' understanding of physics concepts with tangible applications of problem solving

**Medical Scribe**
Our Lady of the Lake Voice Center, *Baton Rouge, LA* **Apr. 2019 – Aug. 2020**
- Contributed to patient care by handling patient charts and inputting physician-ordered imaging and pre-operative bloodwork requests
- Assisted nurses and physicians during in-office procedures
- Recruited and interviewed patients for a study of recurrent respiratory papilloma
- Strong patient communication skills used to connect with patients and ease their stress during in-office procedures

**Manufacturing Engineering Technician**
Johnson and Johnson Advanced Sterilization Products, *Irvine, CA* **Aug. 2016 – Aug. 2017**
- Implemented knowledge of electrical and mechanical engineering to troubleshoot medical device sterilization machines
- Led root-cause investigations for similar high-volume errors
- Rewrote the troubleshooting protocol documentation used in functional-testing failures, which was then administered to auxiliary sites
- Experience using an oscilloscope, voltmeter, soldering iron, and highly concentrated hydrogen peroxide during troubleshooting and experimentation

**Research Assistant & Undergraduate Assistant System Administrator**
Gravitational Wave Physics and Astronomy Center, *Fullerton, CA* **Nov. 2013 – Aug. 2016**

Date of revision: January 31, 2021

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- Assisted with hardware installation and upgrade, account management, monitoring disk usage, and overall health of the super-computer cluster
- Execution of coding knowledge by creating Bash script automating health updates of cluster
- Simulated binary black hole and black hole neutron star mergers using Spectral Einstein Code
- Created figures and tables in peer-reviewed publications from numerical simulations
- Presented research progress at public and private conferences

## ADDITIONAL EXPERIENCE

**Shadowing a Medical Physicist**

Mary Bird Perkins Cancer Center, *Baton Rouge, LA* **Aug. 2019 – Apr. 2020**

- Met with the individuals involved in the radiation planning of patients to better understand the role that medical physicists and dosimetrists play in patient care and treatment
- Learned about the different types of external and internal radiation treatments administered for the respective physical ailments
- Observed simulations of patient set up for treatment, imaging of patients with CT, and radiation treatments using Linear accelerators and radioactive sources
- Watched the quality assurance protocol of a Tomotherapy system

## PUBLISHED PAPERS

"On the properties of the massive binary black hole merger GW170729." *Physical Review D* **100**, 1004015 (2019). https://arxiv.org/abs/1903.06742

- Contributed numerical relativity data of binary black hole mergers with large ratios of the black hole masses

"The SXS Collaboration catalog of binary black hole simulations." *Classical and Quantum Gravity* **36**, 195006 (2019). https://arxiv.org/abs/1904.04831

- Contributed numerical relativity data of binary black hole mergers

"Accuracy and Precision of Gravitational-wave Models of Inspiraling Neutron Star -- Black Hole Binaries with Spin: Comparison with Numerical Relativity in the Low-frequency Regime." *Physical Review D* **92**, 102001 (2015). https://arxiv.org/abs/1507.00103

- Contributed a simulation with rapid black hole spin
- Created Figure 1 using Mathematica comparing the binary black hole mergers

"Nearly Extremal Apparent Horizons in Simulations of Merging Black Holes." *Classical and Quantum Gravity* **32**, 6 (2015). https://arxiv.org/abs/1411.7297

- Contributed to Table I comparing binary black hole merger results
- Tested fine-tuning of numerical methods in simulations
- Added to results for simulations of coalescing black holes

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## PUBLISHED ABSTRACTS

"Comparing numerical and analytical approximate gravitational waveforms." *Dimensions* (2016). http://nsm.fullerton.edu/student-resources/dimensions-the-journal-of-undergraduate-research-in-natural-sciences-and-mathematics

"Predicting Binary Black Hole Collisions Using Numerical Methods in Collaboration with LIGO." *Dimensions* (2015). http://nsm.fullerton.edu/student-resources/dimensions-the-journal-of-undergraduate-research-in-natural-sciences-and-mathematics

## RESEARCH PRESENTATIONS

***Project Phoenix: Holistic Approach to Radiation Induced Side Effects*** ***2020***

SpaceX, *Hawthorne, CA*
*Talk*

***Predicting Binary Black Hole Collisions Using Numerical Methods in Collaboration with LIGO***

American Physics Society April Meeting, *Salt Lake City, UT* **2016**
*Poster*

College of Natural Science and Mathematics Symposium, *Fullerton, CA* **2016**
*Poster*

Southern California Conferences for Undergraduate Research, *Claremont, CA* **2015**
*Poster*

College of Natural Science and Mathematics Symposium, *Fullerton, CA* **2015**
*Poster*

Conference for Undergraduate Women in Physics, *San Diego, CA* **2015**
*Poster*

***Predicting Binary Black Hole Properties after Collision Using Numerical Methods***

College of Natural Science and Mathematics Symposium, *Fullerton, CA* **2015**
*Poster*

Research Day, *Fullerton, CA* **2014**
*Poster*

***Comparing Binary Black Hole Collisions Produced by Numerical Methods with Approximations***

College of Natural Science and Mathematics Symposium, *Fullerton, CA* **2015**
*Poster*

Southern California Conferences for Undergraduate Research, *Claremont, CA* **2015**
*Poster*

College of Natural Science and Mathematics Symposium, *Fullerton, CA* **2014**
*Poster*

College of Natural Science and Mathematics Symposium, *Fullerton, CA* **2014**
*Talk*

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## AFFILIATIONS

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|---|---|
| American Association of Physicists in Medicine, *Louisiana State University* | **2020 – Present** |
| National Society of Collegiate Scholars, *California State University, Fullerton* | **2011 – Present** |
| American Physics Society, *California State University, Fullerton* | **2012 – 2017** |

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