Curriculum Vitae

Personal Information

Name Isaac Legred

Date of Birth *October 17, 1997*
Email ilegred at caltech dot edu
Affiliation Caltech, LIGO Lab

Research Interests

I'm a graduate student interested in nuclear astrophysics, and I address a broad range of problems using computational, (simulation based and data based) approaches. In particular, I am interested in neutron stars, and interaction of observations and theory in the domain of high energy astrophysics.

Education

Fall 2020 – present **California Institute of Technology** *Pasadena, CA*
Pursuing a Ph.D. in Physics

Aug 2016 – May 2020 **Cornell University** *Ithaca, NY*
B.A. in Physics, B.A. in Mathematics
Magna Cum Laude in Physics, Magna Cum Laude in Mathematics, Distinction in all Subjects

Sep 2012 – June 2016 **Mahtomedi High School** *Mahtomedi, MN*

Publications and Research outcomes

Jun 2018 – **Simulating Extreme Spacetimes Collaboration** *Cornell University, Caltech*
SpECTRE code, contributer

- Simulating magnetized neutron stars with discontinuous Galerkin methods, contributing author
- (Undergraduate thesis) Testing the No-Hair Theorem: The Precessing Case (2020 Bethe Thesis Award) qnm-fitting, the code used for this work
- Simulating neutron stars with a flexible enthalpy-based equation of state parametrization...

October 2020 – **LIGO Collaboration** Caltech – Equation of State of Dense Nuclear Matter and Neutron Stars

- Impact of the PSR J0740+6620 radius constraint on the properties of high-density matter
- Implicit correlations within phenomenological parametric models...
- Phase transition phenomenology with nonparametric representations of the neutron star... contributing author
- Assessing equation of state-independent relations for neutron stars with nonparametric models

Teaching

Fall 2017 – Spring 2020 **Physics Undergraduate Teaching Assistant** *Cornell University*
I was an undergraduate teaching assistant for 6 semesters, having TA'd Introductory Quantum Mechanics, Waves and Thermal Physics, Electromagnetism (Lab), and an Engineering Waves and Quantum Physics Course.

Winter 2021 **Teaching Assistant and Section leader for Ph 1b, Caltech**
Taught an introductory Special Relativity and Electromagnetism Course.

Spring 2021 **Teaching Assistant and Section leader for Ph 1c, Caltech**
Taught an introductory Special Relativity and Electromagnetism Course.

Selected Invited Talks

Nov. 2021 **LIGO Laboratory Seminar**
Based on this paper.

Oct. 2022 **Perimeter Institute Physics Colloquium**
Based on this paper.

Feb. 2024 **INT Nuclear matter workshop**
Based on this paper.

Feb. 2024 **MUSES Seminar**
Based on this paper.