

## Research Interests

Stellar Astrophysics, especially the Modules for Experiments for Stellar Astrophysics (MESA) project.

Explosions - emphasis on their progenitor evolution, nucleosynthesis, and multi-messenger signals.

Seismology, especially of observed variable white dwarfs.

Thermodynamics, Opacities, and Nuclear Physics - stars are gravitationally confined nuclear reactors.

Chemical evolution, growth of every isotope, atom, and molecule at every point in spacetime.

Astrobiology, production and delivery of bioessential elements to habitable systems.

Gamma-ray astronomy, particularly energetic photons from the decay of radionuclides.

Neutrino astronomy, in general and especially from pre-supernova massive stars.

## Recent Appointments

2022 – Associate Editor-in-Chief, American Astronomical Society [Journals](#)

2019 – Senior Lead Editor, American Astronomical Society [Journals](#)

2016 – Lead Editor, American Astronomical Society [Journals](#)

2009 – Scientific Editor, American Astronomical Society [Journals](#)

2008 – Professor, SESE, ASU

## Recent Honors

2015 Simons Fellow in Theoretical Physics

2014 Fellow, American Physical Society

## Select Recent Research Funding

Since 2008: \$26.5M, \$7.3M to ASU

2022 – 2025 NSF PI \$422K, *Neutrino Emission From Stars*

2022 – 2025 NASA PI \$476K, *Probing The Interior Composition Of White Dwarfs*

2019 – 2024 NSF Co-PI \$2M, *AccelNet-WOU: International Research Network ...*

2017 – 2022 NSF PI \$2.3M, *Modules for Experiments ... (MESA)*

2014 – 2022 NSF Co-PI \$11.2M, *Physics Frontiers Center, JINA-CEE*

## Recent Education and Outreach Activities

2019 – Principal Content Provider, American Astronomical Society [YouTube](#) Channel

2011 – 2022 Director & Lecturer, MESA Summer School, UC Santa Barbara

2015 – 2018 Largest college-credit eligible astronomy course in the world, ~10,000 students/yr

## Publication Summary

