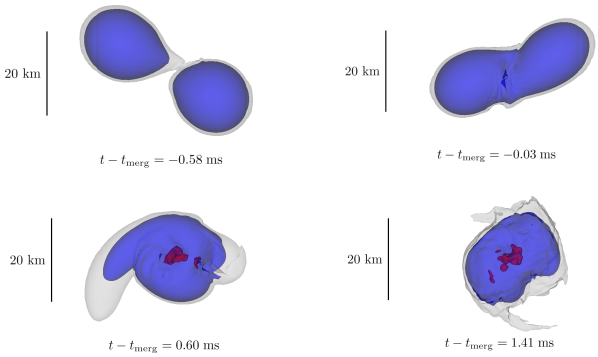
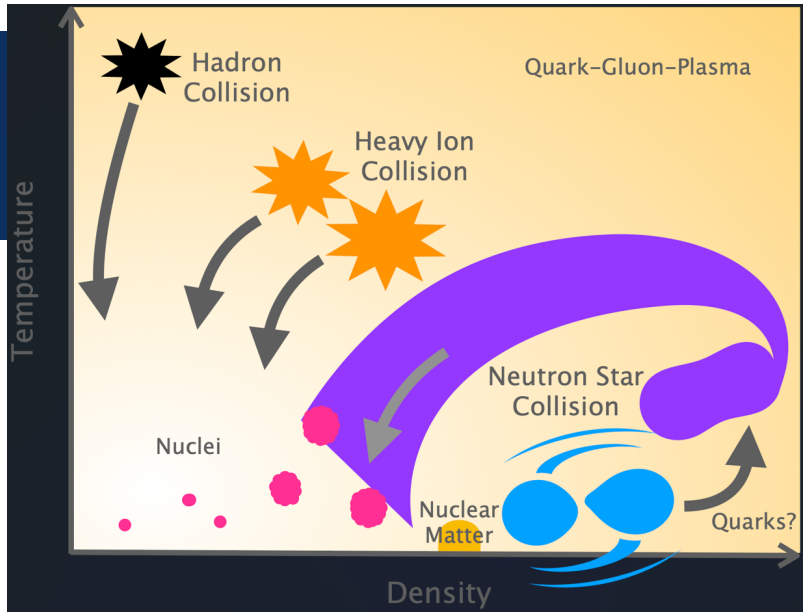
The Extreme Physics of Neutron Star Mergers





Dates: Asynchronous, self-paced learning starts September 27, 2025
One-day in-person workshop, October 4, 2025, 9:00 AM-3:00 PM
Location: 118 Room in Chambers Building, University Park
Target audience: High School Physics/Astronomy Teachers

Neutron stars are the remnants formed in the death of massive stars as supernovae. Neutron stars contain more mass than our Sun, compressed in a sphere of less than 10 miles in radius. When neutron stars collide with other neutron stars, or with black holes, they produce some of the most extreme conditions since the Big Bang. Matter is compressed to densities exceeding one hundred trillion times the density of solid iron and heated to temperatures in excess of one trillion degrees Kelvin. Through the observation of neutron star mergers, scientists are able to study the behavior of matter in conditions that cannot be produced in any terrestrial laboratory.

Through an online module series, multimedia resources, and interaction with Penn State researchers, teachers will gain tools to bring cutting-edge astrophysics into their classrooms in an accessible and inspiring way. This workshop aims to demonstrate key ideas and computational models used to interpret astronomical observations of neutron star mergers to probe the nature of matter in their cores.

Teacher Benefits

- Teachers will receive a $250 stipend for attendance and implementation. Lunch and parking provided.
- Participating teachers have access to the online modules to assist with implementing their unit.
- Act 48 Credits will be provided upon request.

To apply:
https://www.csats.psu.edu/forms/registration

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Numerical Relativity Group
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