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**Dissertation Award in Nuclear Physics Recipient: Astromaterials in Neutron Stars**

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Stars freeze. As they age and cool white dwarfs and neutron stars crystallize, with remarkable materials forming in their interiors. These ‘astromaterials’ have structures similar to terrestrial crystalline solids and liquid crystals, though they are over a trillion times denser. Notably, because their material properties affect the observable properties of the star, astromaterials must be understood to interpret observations of neutron stars. Thus, astromaterial science can be thought of as an interdisciplinary field, using techniques from material science to study nuclear physics systems with astrophysical relevance. In this talk, I will discuss recent results from simulations of astromaterials and how we use these results to interpret observations of neutron stars in X-ray binaries. In addition, I will discuss how nuclear pasta, in neutron stars, forms structures remarkably similar to biophysical membranes seen in living organisms.