Furnstahl Group: Low-Energy Nuclear Theory (LENT)

Prof. Dick Furnstahl's group does theoretical research on low-energy nuclear physics. In this context, "low-energy" means the structure and reactions of bound atomic nuclei (as opposed to relativistic heavy-ion collision physics also studied at OSU) with applications to astrophysics, such as nucleosynthesis and neutron star physics. The research by group members develops and applies:

- renormalization group (RG) methods to nuclei;
- effective field theories (EFT) for few- and many-body systems;
- Bayesian statistics and machine learning for nuclear UQ and physics discovery;
- computational physics methods.

There are typically 2-3 graduate students doing thesis work (i.e., past candidacy) at any given time.

Papers from the last three years co-authored by Prof. Furnstahl can be found here; these include recent work by graduate students Anthony Tropiano (Short-range correlation physics at low renormalization group resolution), Jordan Melendez (*How Well Do We Know the Neutron-Matter Equation of State at the Densities Inside Neutron Stars? A Bayesian Approach with Correlated Uncertainties* and several more by Jordan), and Alberto Garcia and Patrick Millican (Efficient emulators for scattering using eigenvector continuation and Fast & accurate emulation of two-body scattering observables without wave functions).

Recent talks by Prof. Furnstahl (the slides are linked) include "Short-range-correlation physics in atomic nuclei," "Turning the nuclear EDF method into a proper EFT," "Similarity Renormalization Group (SRG) in Nuclear Physics," and "Theory error bars for nuclei." Follow the links for slide from talks at recent APS (virtual) meetings by LENT graduate students Alberto Garcia, Mostofa Hisham, Patrick Millican, Anthony Tropiano.

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If you have any questions, please do not hesitate to send email to Furnstahl.1@osu.edu.