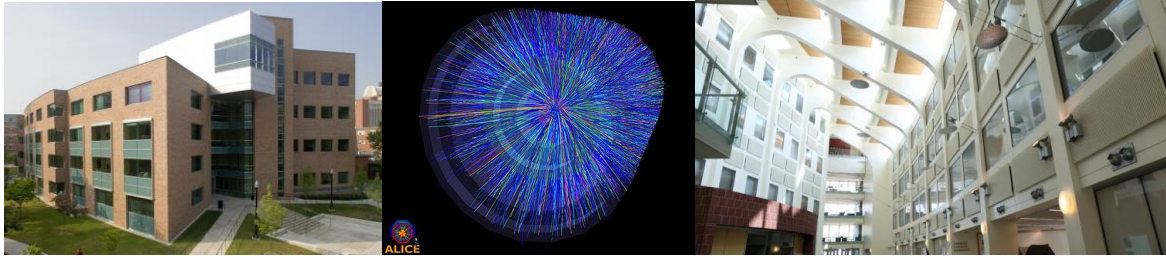


Graduate Studies in Nuclear Physics at Ohio State University (OSU)



Nuclear People:

Faculty: 7
Postdocs: 5
Graduate Students: 12

Other Graduate Research Areas:

AMO Physics, Biophysics, Cold Atoms, Condensed Matter Physics, Cosmology and Astro-Particle Physics, High Energy Physics, and Physics Education

Application deadline:

*Dec. 13 for domestic applicants;
Nov. 30 for international applicants.*

Departmental web site:

physics.osu.edu

Application site:

physics.osu.edu/graduate-admissions-application

Contacts for Nuclear Physics:

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614-292-8524
lisa.1@osu.edu
www.physics.ohio-state.edu/~lisa/

Dick Furnstahl (theory)
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www.physics.ohio-state.edu/~furnstah/

About OSU:

The university's main campus is one of America's largest and most comprehensive. Ohio's best and a top-20 public university, Ohio State is further recognized by a top-rated academic medical center and a premier cancer hospital and research center. Founded as a land-grant university, OSU has campuses and research centers located around Ohio.

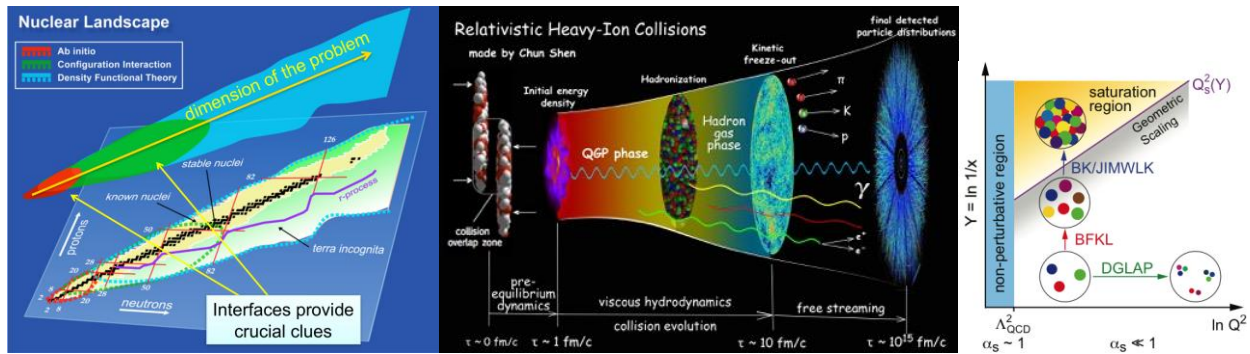
Nuclear Physics Research at OSU:

Nuclear physicists at OSU study a broad range of problems involving the strong interaction. This research includes the direct study of quantum chromodynamics (QCD), the relativistic field theory of quarks and gluons, the connection of QCD to effective theories at low energies, and the manifestation of QCD in the highly compressed and excited nuclear matter created in relativistic heavy-ion collisions.

Effective field theory (EFT) and renormalization group (RG) methods are used by group members to quantitatively explain how low-energy nuclear phenomenology emerges from QCD. These methods enable systematic and model-independent calculations with error estimates, using control over the degrees of freedom to optimize convergence.

At very high densities and temperatures, QCD predicts that strongly interacting matter turns into a quark-gluon plasma (QGP). This QGP can be created in relativistic heavy-ion collisions, and group members are among the leaders in experimental efforts at RHIC and the LHC and in developing theoretical descriptions for the creation, thermalization, and collective dynamical evolution of the QGP.

In high-energy proton or nuclear collisions, the density of gluons is very high and is predicted to reach an interesting new regime called parton saturation. The OSU group is highly active in [plans](#) for an [Electron-Ion Collider](#) (EIC) to discover this phenomenon, and to explore how the proton spin is distributed among its quarks and gluons.



Nuclear Faculty at OSU:

- **Prof. Richard Furnstahl** — Effective field theory and renormalization group methods for nuclear systems; FRIB science; QCD and nuclear phenomena; microscopic nuclear density functional theory; computational many-body methods; Bayesian uncertainty quantification.
- **Prof. Ulrich Heinz** — Phenomenology of particle production in relativistic heavy-ion collisions; thermal quantum field theory in and out of equilibrium; relativistic kinetic theory and relativistic (viscous) hydrodynamics; creation, thermalization, and dynamics of quark-gluon plasma.
- **Prof. Thomas Humanic** — Relativistic Heavy-Ion Collisions; CERN LHC ALICE experiment; boson interferometry; extra-dimensional physics; collision model calculations.
- **Prof. Sabine Jeschonnek** — Investigating matter with electromagnetic probes: electron scattering from few-body systems, in particular from the deuteron; short-range structures in few-body systems; quark-hadron duality.
- **Prof. Yuri Kovchegov** — QCD at high energy and high parton density; heavy-ion collisions and deep-inelastic scattering; applications of string theory to QCD; spin structure of the proton.
- **Prof. Michael Lisa** — Experimental study of relativistic heavy-ion collisions at STAR/RHIC and ALICE LHC; two-particle intensity interferometry, a.k.a. femtoscopy; collective response at ultra-high energy densities and pressure; exploration of the phase diagram of QCD.
- **Prof. Robert Perry** — Quantum chromodynamics; light-front field theory; renormalization group and effective field theory.

About Columbus, Ohio:

Ohio's capital is a friendly city of sleek, modern high-rises and century-old buildings along the banks of the Scioto River. In addition to being home to one of the [finest universities in the nation](#), its attractions range from a rich visual and performing arts scene to a renowned zoo, exciting sports, fine restaurants, and enough specialty shops, outlets, and malls to satisfy even the most avid of browsers and buyers. Find out more about places and things to do in [Columbus](#).

