Celebrating Wanda's birthday: a career devoted to the richness of nuclear many-body physics

Report of Contributions

https://agenda.infn.it/e/46508

Contribution ID: **1** Type: **not specified**

From relativistic ion collisions to nuclear structure and back

Thursday, 3 July 2025 17:15 (45 minutes)

In recent years an intriguing and somehow surprising connection between low-energy nuclear structure and high-energy ion collisions has been established.
In this talk I will discuss such a connection by first reviewing some results of nuclear structure theory and then applying them to the description of hadron distributions in relativistic nuclear collisions.

Primary author: SOMA, Vittorio (CEA Saclay)

Presenter: SOMA, Vittorio (CEA Saclay)

Contribution ID: **2** Type: **not specified**

Extending the fluid dynamic description to times before the collision

Friday, 4 July 2025 09:30 (45 minutes)

Over the past two decades, research has shown that various observables measured in heavy-ion collisions can be effectively described using relativistic fluid dynamics across different collision systems and energies. However, a common challenge in these studies is the modeling of the transition from the initial state to the fluid-dynamic phase. While the collision likely involves complex, far-from-equilibrium dynamics, it is possible that a second-order fluid theory can adequately capture its softer features. In our work (arXiv:2410.08169), we investigate this possibility. We discuss how to characterize the state prior to the collision within this framework, the implications of relativistic causality on the equations of motion, the entropy production from shear and bulk viscous dissipation during the initial longitudinal dynamics, and how this can inform sensible initial conditions for subsequent transverse expansion. If successfully completed, this approach could lead to a comprehensive dynamical description of a heavy-ion collision, where the only free parameters are related to the thermodynamics and the transport properties of quantum chromodynamics.

Primary author: CAPELLINO, Federica (GSI)

Presenter: CAPELLINO, Federica (GSI)

Contribution ID: **3** Type: **not specified**

Opening

Thursday, 3 July 2025 14:30 (15 minutes)

Address by Unito and INFN representatives

Contribution ID: **4** Type: **not specified**

A guided tour through Wanda's career, with personal memories of the participants

Thursday, 3 July 2025 14:45 (30 minutes)

Contribution ID: **5** Type: **not specified**

TBA

Thursday, 3 July 2025 15:15 (45 minutes)

Presenter: RATTI, Claudia (University of Houston)

Contribution ID: **6** Type: **not specified**

Relativistic Heavy Ion Collisions and Nuclear Structure

Thursday, 3 July 2025 16:30 (45 minutes)

In this talk, I shall discuss unexpected connections that have emerged recently between nuclear structure and relativistic heavy ion collisions. In particular, I shall show how the flow patterns of particles produced in heavy ion collisions at high energy can provide accurate information on low energy properties of nuclei, such as deformations, collective modes, etc

Presenter: Prof. BLAIZOT, Jean Paul (CEA)

Contribution ID: **7** Type: **not specified**

Discussion

Thursday, 3 July 2025 18:00 (30 minutes)

Contribution ID: **8** Type: **not specified**

Constraints on the Neutron Star Matter Equation-of-State

Friday, 4 July 2025 10:15 (45 minutes)

Observations of the heaviest neutron stars, together with mass and radius measurements, and gravitational wave signals from binary neutron neutron star mergers, progressively tighten the constraints on the equation-of-state of dense baryonic matter. Using the presently available data base, results are presented of detailed Bayesian inference analyses. A focus is on prerequisites and limitations for hypothetical phase transitions at the baryon densities realized in neutron star cores. The possible structure and composition of matter under such conditions are discussed.

Presenter: Prof. WEISE, Wolfram (TUM)

Contribution ID: **9** Type: **not specified**

Scalar and pseudoscalar mesons in the PNJL model

Friday, 4 July 2025 11:30 (45 minutes)

Presenter: Dr HANSEN, Hubert (CNRS/IN2P3, IP2I Lyon)

Contribution ID: **10** Type: **not specified**

TBA

Friday, 4 July 2025 12:15 (45 minutes)

Presenter: PAROTTO, Paolo (Istituto Nazionale di Fisica Nucleare)