

Post-doctoral experimental physicist position for the FAZIA@INDRA program

Over the last few decades, the study of heavy ion collisions with the INDRA charged particle multi-detector has permitted major advances in the understanding of the dynamics and thermodynamics of nuclear matter, most notably: demonstrating the existence of different phases of nuclear matter; the study of transformations between these phases in the context of thermodynamics of finite systems; and deduction of in-medium transport properties of nuclear matter far from equilibrium. Nevertheless, a crucial element is missing from most of the experimental results available today: the chemical composition of the reaction products (isotopic resolution) can only be measured for the lightest nuclei with INDRA. We still do not know how neutrons are distributed among the many intermediate mass fragments ($Z=5\sim 20$) produced by these collisions.

For this reason the FAZIA and INDRA collaborations have developed an ambitious program using the coupling of these set-ups in order to perform the most complete measurement possible to date of the formation and decay of hot nuclei in these reactions. FAZIA provides isotopic identification for nuclei with $Z\leq 25$ with the resolution of a magnetic spectrometer but without any limit in acceptance. 12 blocks of FAZIA telescopes (192 telescopes in total) will replace the first rings of INDRA at the most forward angles in order to perform the experiments, which will be used to study: collision dynamics (in-medium transport properties of asymmetric matter); equation of state and phase transitions (symmetry energy); clusterization phenomena (in-medium structure effects); secondary decay of hot exotic nuclei (isospin dependence of the nuclear level density parameter). Installation of the FAZIA detectors at GANIL is already underway; the first experiments could take place beginning in 2019.

An 18 months fixed-term contract is available in the GANIL physics group from December 2018 for an experimental nuclear physicist (Ph.D.) who will play a major role in the coupling of FAZIA with INDRA and performing the experiments, and who will take charge of part of the analysis of the results of the first measurements concerning Nuclear Matter Equation of State knowledge related to the project FIDNEOS (Fazia Indra Data for Nuclear Equation of State) supported by the Normandy Regional council.

Desired skills: experience of experimental nuclear physics; teamwork; autonomy; good C++ programming skills would be an advantage; knowledge of digital electronics would be an advantage but is not a deal-breaker

**Candidates should submit their application by October 20th, 2018
(motivations, detailed CV, a list of publications and reference letter(s)) to:**

Contact: Dr. John Frankland (frankland@ganil.fr)