

FUSTIPEN visit
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My FUSTIPEN visit at Ganil lasted a little less than three weeks from January 14 to February 3 2011. During the first week of my stay, I participated to the FUSTIPEN Inauguration on January 18 and the First FUSTIPEN Workshop "Bridging the Atlantic with Exotic Isotope Physics" the day after. During the workshop, I gave a talk "Description of charge radii in halo nuclei within the Gamow Shell Model" related to my research on light exotic nuclei. The workshop contained many talks covering current research on nuclear structure, especially regarding exotic nuclei and it definitely served the goal of promoting networking among French and US nuclear physicists regarding future collaborations.

The following days of my visit were dedicated to discussions and the start of a collaboration on an *ab initio* description of exotic nuclei with Prof. M. Ploszajczak (Ganil) and Prof. B. R. Barrett (University of Arizona). The goal of this project has been to construct a microscopic theoretical model of light exotic nuclei by combining the formalism of the Gamow Shell Model (GSM) and the technique of the Density Matrix Renormalization Group (DMRG). The GSM provides a microscopic description of weakly-bound, unbound nucleus by representing the many-body nuclear Hamiltonian in a basis that includes bound, resonant and scattering states. The dimension of the many-body model space growing dramatically with the number of nucleons, efficient diagonalization techniques such as DMRG are necessary to diagonalize this large non hermitian problem. The DMRG technique will provide a numerical resolution of this eigenproblem by allowing truncations of the many-body space by selecting and keeping only the most important many-body states in the continuum.

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