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RE: Exit Report: FUSTIPEN visit to GANIL by Dr. Bruce R. Barrett, March 19-23, 2012

Dr. Robert Janssens  
Co-Director: FUSTIPEN  
Argonne National Laboratory

Dear Robert,

This is my exit report on my FUSTIPEN visit to GANIL from March 19-23, 2012. I arrived in Caen on March 19, 2012, and went directly to GANIL, where I met with Marek Ploszajczak, Jimmy Rotureau (Chalmers U. Technology) and George Papadimitriou (U. Arizona). We started discussions on how to develop the formalism for applying the Gamow Shell Model method to the No Core Shell Model (NCSM). This new formalism, which we refer to as the No Core Gamow Shell Model (NCGSM), will allow us to include the effects of the continuum, *e.g.*, resonances and non-resonant continuum states, into the NCSM. These discussions continued after lunch for the remainder of the day.

On March 20-21 I participated in the FUSTIPEN Topical Meeting on *Understanding Light Nuclei Microscopically*, which had 21 attendees. There were 11 high-quality talks over the two days, ending with a group discussion of the high points of the meeting and what we had learned. I was one of the speakers at this meeting, talking about how to extend the NCSM beyond  $0p$ -shell nuclei, and also led the group discussion at the end of the second day. This was a very interesting and informative meeting. We also discussed the possibility of holding similar meetings in the future.

On March 22-23 we continued our group discussions on the NCGSM and studied early test results for  $^3\text{H}$  and  $^4\text{He}$ , which were very encouraging. These will be followed by calculations for  $^5\text{He}$ . On Wednesday, March 22 I also gave a FUSTIPEN lecture at GANIL on *Using Concavity of Thermodynamical Functions to Predict Nuclear Binding*.

My FUSTIPEN visit to GANIL March 19-13, 2012, was very successful and met our goals of getting our collaboration on the NCGSM up and running, along with developing our strategy for future calculations and investigations.

From March 23 to April 13, 2012, I also co-organized a workshop at Saclay with my colleague and collaborator, Dr. Bertrand Giraud, on *Ab initio DFT, relation between the energy of a nucleus and the density at its center*. This part of my visit was supported by CEA Saclay.

With best regards,

Bruce

Bruce R. Barrett