

## David Dean Travel Report

I spent the first week of this trip at the RIKEN research institute in Wako-shi, Tokyo at Japan U.S. Theory Institute for Physics with Exotic Nuclei (JUSTIPEN). During this visit I had many interesting conversations with Japanese colleagues working in the area of the physics of nuclei and nuclear astrophysics. The first major experiments were being run at the Rare Isotope Beam Facility at RIKEN. This new generation facility will obtain the highest intensity radioactive beams to study exotic nuclei and represents a major (about \$1B) investment in this area of science. During his stay, one new isotope was discovered by RIBF:  $^{125}\text{Pd}$ . I discussed physics with various RIKEN staff members including Tohru Motobayashi, Naoyuki Itagaki, Shinichiro Fujii, and Takashi Nakastukasa. A number of familiar faces were also at RIKEN during this time either working on the first experiments at RIBF or attending a Direct Reactions Workshop. I also worked on understanding the role of size extensivity in many-body theories and began to appreciate the role of this attribute in coupled-cluster theory. Truncated shell-model calculations (particle-hole truncations) do possess this property and therefore their error is uncontrolled as one increases particle number. This is not the case with size extensive methods such as many-body perturbation theory or coupled-cluster theory. This very important property was briefly described in arXiv:0709.0449.

During the second week I attended the International Nuclear Physics Conference (INPC 2007) in Tokyo. This meeting had over 800 participants. I gave a plenary invited talk titled "Progresses and challenges in theory of nuclei". The meeting began with a Sunday afternoon symposium celebrating the 100<sup>th</sup> birthday of Yukawa, the originator of meson theory. The Monday afternoon session was attended by the Emperor and Empress of Japan. The Emperor addressed the audience concerning his desire to see science prosper in Japan. This was a high-light of the conference. A personal highlight was to have tea with the Emperor and Empress (along with about 150 of the participants). Many excellent plenary talks were given at the INPC.