



# Washington University in St. Louis

## ARTS & SCIENCES

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July 31, 2015

FUSTIPEN supported trip to GANIL, Caen, 6/24-7/25 2015

During the period July 5 to July 25 a TALENT course was conducted at GANIL, Caen. The material was covered in Course 2: Many-body methods for nuclear physics. The teachers of this course were Arturo Polls (U of Barcelona), Morten Hjorth-Jensen (U of Oslo, NSCL/MSU), Gaute Hagen (ORNL), Carlo Barbieri (U of Surrey) and myself. Local organizer was Marek Płoszajczak (GANIL) who performed almost all of the administrative issues related to student selection and took care of arranging for local housing and meals. The course was attended by 24 students from all over the world. The emphasis was placed on two ab initio methods, the Coupled-Cluster and the Green's Function method as applied to finite and infinite nuclear systems.

The course was structured in the following way: every morning two 1.5 hour lectures were given while the afternoon was devoted to computational work and problem solving related to the lectures. The diverse background of the students was carefully considered by paying attention to their computational experience, and background in theory or experiment. Relevant material can be accessed from the course webpage [https://groups.nsl.msu.edu/jina/talent/wiki/Course\\_2](https://groups.nsl.msu.edu/jina/talent/wiki/Course_2) which was available throughout to the students and remains accessible like material from other TALENT courses.

The advantage of bringing together experienced practitioners of ab initio methods is that differences and similarities can be discussed and even benchmarked by calculations. In addition, lectures were often also very helpful for other instructors in gaining insight into the practical applications of other methods. Most importantly is of course the exposure of a cohort of students to advanced methods in many-body theory which will allow them an entrance for further study and help them in their research path. Furthermore there exist a possibility for students in Europe to receive course credit for successfully completing the course. An integral part of the course is then the required completion of a numerical project related to

the course material, initiated during the course, and finished within 4 to 6 weeks after the course under the supervision of one of the instructors.

All students were asked to provide feedback related to the material and chosen form of implementation of the course. The response was overwhelmingly positive.

I close my brief report by acknowledging the importance of the FUSTIPEN support which not only provided funding for my own trip but is also instrumental in allowing one of my own graduate students (Mack Atkinson) to participate in this TALENT course.

Sincerely,



Willem H. Dickhoff  
Professor of Physics