TALENT Course

Theory for exploring nuclear structure experiments

The recently established initiative TALENT: Training in Advanced Low Energy Nuclear Theory (see also http://www.nucleartalent.org) aims to provide an advanced and comprehensive training to graduate students and young researchers in low-energy nuclear theory. The initiative, a multi-national network of several European and North American institutions, aims to develop a broad curriculum that will serve as a platform for cutting-edge theory of nuclei and their reactions. The graduate program is divided into 9 modules. Each module includes a series of lectures, commissioned from experienced teachers in nuclear theory, and focused on problem-based learning and hands-on experience. The educational material generated under this program will be collected in the form of WEB-based courses, textbooks, workbooks and a variety of modern educational resources.

The long-term goal of the TALENT initiative is to develop a graduate program of excellence in low-energy nuclear theory. The program will build a network of strong connections between universities, research laboratories and institutes worldwide, and provide a unique training resource to support the future needs of nuclear physics. Each course is planned to run full-time for three weeks and consists of 45h of lectures, 45h of exercises and a project-based assignment of 2 weeks work. The total workload is approximately 240 hours, corresponding to 10 ECTS in Europe.

A TALENT course on *Theory for exploring nuclear structure experiments* will be delivered by Mark Caprio (University of Notre Dame), Richard Casten (Yale University), Jan Jolie (University of Cologne), Augusto Macchiavelli (Lawrence Berkeley National Laboratory), Norbert Pietralla (Technische Universität Darmstadt) and Piet Van Isacker (GANIL). It will take place at GANIL, Caen, France, from 11 to 29 August 2014. The course will begin with a review of the phenomenology of nuclear structure (and some simple interpretational tools) and an introduction to basic many-body techniques. Standard models of nuclear structure (including the nuclear shell model, the Nilsson model, the geometric collective model, the interacting boson model and pairing models) will be presented in lectures that emphasize the conceptual issues, and will be utilized in exercise sessions where participants are given the opportunity to acquire hands-on experience through the use of computer codes and hand calculations that highlight the essential physics of these models. The detailed course content can be found at http://www.nucleartalent.org, course 5. The course is designed to be accessible both to students in theory and to theoretically inclined students focusing on experimental work.

Prospective student participants are expected to be familiar with standard mathematical methods for scientists and to have a practitioner's knowledge of intermediate level quantum mechanics. Students who are not familiar with the above will be expected to study some selected material in advance of the course.

Registration is now open. The target groups are Master of Science and PhD students and early post-doctoral researchers, both theorists and experimentalists. More experienced researchers may apply, but will be considered only on a fully self-supported basis if numbers and space permit. The maximum number of participants will be 25, at most 20 of which can receive local support. Processing and selection of students will be managed in agreement with the University of Caen and GANIL.

Applications should include curriculum vitae, a description of academic and scientific achievements to date (publications, awards, etc.), a short letter expressing the applicant's personal motivation for attending the course and a statement if local support is needed. A reference letter from the candidate's academic supervisor should also be included or sent separately to the email address below.

All applications should be submitted electronically at the following address: talent-school@ganil.fr

Deadline for applications: April 30, 2014.