

TALENT Course

Theory for exploring nuclear reaction 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, but is driven by problem-based learning, providing 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 170 hours, corresponding to 7 ECTS in Europe. The first TALENT course was held at the European Centre for Theoretical Studies in Nuclear Physics and Related Areas (ECT*), Trento, Italy in June 2012.

The next TALENT course on *Theory for exploring nuclear reaction experiments* will be delivered by Filomena Nunes (Michigan State University), Pierre Descouvemont (ULB, Brussels), Antonio Moro (University of Sevilla), Jeff Tostevin and Edward Simpson (University of Surrey). It will take place at GANIL, Caen, France, from July 1st to July 20, 2013. This advanced course will focus on direct reaction theory and methods and their applications to reactions of light and heavy-ions from low (near-Coulomb barrier) energies through intermediate and relativistic energies (of 100 MeV/nucleon and greater). Exposure to this range of systems will introduce both specific and more generic methods and approximations used in modelling and interpreting nuclear collisions and direct reactions - allowing participants to develop an experience of using both the concepts and associated codes for selected reaction problems – exploiting and consolidating understanding of the more formal taught elements.

Prospective student participants will be expected to already have some experience in programming and be familiar with data manipulation and graphical utilities, etc. A good foundation in both standard mathematical methods for scientists and a practitioners knowledge of intermediate level (advanced undergraduate/postgraduate) quantum mechanics and quantum scattering theory is important. Students who have not already studied the above formally will be expected to study suggested pre-course materials in advance of the course. More complete details of both the course content and the timetable of delivery will be available in early January 2013.

Registration is now open. The target groups are Master of Science and PhD students and early post-doctoral researchers, both experimentalists and theorists. 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: a curriculum vitae, a description of academic and scientific achievements to date (any 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 following address.

All applications should be made electronically to talent-school@ganil.fr.

Deadline for applications: March 31 2013.