

## **Fudan Physics Teaching Lab**

The Fudan Physics Teaching Lab was formerly known as the physics laboratory founded in 1952, then separated into general physics laboratory and modern physics laboratory. Later on, the physics demonstration laboratory was established. Many senior professors of Department of Physics such as Wang Fushan, Zhou Tongqing, Lu Hefu, and Xie Xide had made contribution to and supported the development and growth of the laboratory. Sixty years ago, after the adjustment of the department, the first head of the experimental teaching and research group was Mr. Zhou Tongqing, a famous first-class professor (later on became the first academician of Chinese Academy of Sciences out of the Department of Physics). With the continuous development of the education reform, in 1998 the Physics Teaching Lab (hereinafter referred to as the Lab) was established by combining the original general physics laboratory, modern physics laboratory and physics demonstration laboratory, and then became an important part of National Basic Science Talent (science) Training Base - Fudan University Physics Base.

In the past three years from 1998 to 2000, supported by base construction funding and the first phase of "211 Project", the Lab vigorously promoted the reform of the experimental teaching in accordance with personnel training requirements, and pioneered in a series of unique experimental courses including "Experimental garden", "Self-study physics experiments", "Comprehensive physics experiments" and other courses designed to develop students' thinking capacity and to inspire students' innovation ability. Consequently, the students' personalization in experimental teaching had been apparently enhanced, and the experimental teaching quality had been significantly improved.

In the five years from 2000 to 2005, the Lab obtained the support of "Three-year Action Plan" of the university and of "The World Bank Loan" of the Ministry of Education, and took in charge of "Research on teaching content and instrumentation of designing or research experiments", a new-century higher education reform project. The Lab took the idea of improving the personnel training quality as an important part of constructing high-quality and unique lab, built multi-level experimental teaching system aiming at ability cultivation, and set up "Designing and research physics experiments" courses aiming at cultivating students' creative ability, attracting a large number of outstanding undergraduate students to carry out experimental research and experimental learning, which greatly improved the students' experimental skills and innovation ability, and sprung up a number of experimental teaching achievements. The Lab was honored as the Shanghai Municipal Experimental Teaching Demonstration Center in 2006, and selected for the Construction Unit of the National Experimental Teaching Demonstration Center in 2007.

Since 2008, vigorously supported by "985" funding, the Lab strengthened scientific method and scientific thinking training for undergraduate students in accordance with the education philosophy of "Student Orientation", thus optimized experimental teaching system on the cultivation of "Knowledge, Ability and Scientific Literacy". Under the

premise of strengthening the basic training, the Lab has focused on building teaching experiments relating to "new technologies", "new phenomena", "new materials" and "new applications" in the development of modern physics, enriched the teaching of modern physics experiments, and led the construction of other experimental programs. Along with setting up the selective course of "medical physics experiments" for students majoring in medical science, as well as the establishment of new courses such as "physics demonstration experiment development" and "mechanical design and processing basis", a well-arranged and coherent new experimental curriculum system tends to become more complete and reasonable.

In order to enable students actively participate in the experimental teaching reform, a new lab website is established to break the traditional teaching's restriction in time and space by adopting flexible, efficient and highly interactive wiki system. The Lab also takes a new measure to combine the theoretical teaching with the experimental teaching, hires professors engaging in the research of forefront science to teach experimental courses, accelerates the pace of the introduction of talent, and by the establishment of learning-oriented teachers, it gradually forms a high-level experimental teachers made up of full-time experimental teachers and part-time teachers.

Thanks to Laboratory teachers' love and dedication, as well as their enthusiasm to the experimental teaching, fruitful results have been achieved: "university physics experiment" (2008), "liberal arts physics (theoretical and experimental)" (2009), and "modern physics experiments" (2010) have been granted national excellent courses. Every year, there are many teachers honored awards at all levels. The Lab was named as the Shanghai Municipal Education System Civilized Team in 2010, and won the honorary title of the Shanghai Municipal Education Pioneer in 2011.

"Doing on thinking, with Comprehensive Training, Solid Foundation, and Innovation", the Lab will continue to rely on high-level research team of Department of Physics to rationally combine theoretical teaching, scientific research and experimental teaching, to strive to deepen the teaching reform, and to take efforts to build the Lab as a base for training undergraduate students' basic laboratory skills and comprehensive scientific literacy.