

Scientific report on the “School on UV- and x-ray spectroscopies for correlated electron materials” (“SUCCESS 2017”), Les Houches, France, Sept. 4-15 2017.



A prerequisite for assessing spectral properties of materials from first principles is a sufficiently accurate treatment of electronic Coulomb correlations. Spectroscopic measurements are thus both, a means to obtain insight into the properties of materials classes of interest, and a treasure box for providing benchmark data for the development of theoretical methods.

The School on UV- and x-ray spectroscopies for correlated electron materials (“SUCCESS 2017”), held in Les Houches between Sept. 4 and 15 2017 illustrated this double role in multiple manners. The event brought together 43 master/PhD students and postdocs and, as lecturers, experimental spectroscopists and electronic structure theoreticians. The goal was to provide participants with a comprehensive first-hand overview on the field, to establish a forum for exchange of ideas, results, and open problems, to raise awareness for experimental subtleties among the theoreticians and for theoretical limitations among the experimentalists (and, at some occasion, to help overcome language gaps between the respective communities!), and last but not least to foster interactions and collaborations within the larger community of participants and lecturers.

The program started with relatively basic introductions to the physics of correlated materials, effects arising from strong correlations and their theoretical modelling. It gave an introduction to current day first principles techniques, ranging from density functional theory and its extensions, over dynamical mean field techniques (including the question of photoemission matrix elements) until

specialized cluster treatments of specific spectroscopic techniques. At the same time, students became acquainted with the details of the photoemission process within the three-step and one-step models, with novel developments such as spin-resolved photoemission or time-resolved spectroscopies, as well as illustrations on selected materials systems ranging from classical works until questions of current research.

Two poster sessions as well as several sessions of participants' talks gave all participants the occasion to present their work, discuss scientific problems and potentially develop collaborations around topics of their interest.

The prestigious and beautiful Ecole de Physique des Houches, Les Houches, France, provided an ideal framework for the school. Participants and lecturers were housed in a tiny village-like group of *chalets*, with as most important infrastructures a lecture hall with corresponding coffee room facilities, a dining hall and a bar for after dinner discussions, within the beautiful settings of the French Alps.

Within a survey at the end of the school, the participants expressed their great enthusiasm about the school, the program and the interactive and interdisciplinary spirit. Among the most often highlighted aspects were the equilibrium between theoretical lectures and materials-oriented presentations, concepts and technical details. The pedagogical efforts by the lecturers have been appreciated explicitly, and the numerous occasions for informal exchanges were clearly a very positive point for many participants. Finally, the general organisation and overall atmosphere of the school were mentioned with enthusiasm. As a result, 100% of the participants answering the survey voted for a continuation of the "SUCCESS story", motivating us to put down a pre-reservation at the Ecole de Physique des Houches for september 2020.



**Financial report on the “School on UV- and x-ray spectroscopies for correlated electron materials”
 (“SUCCESS 2017”), Les Houches, France, Sept. 4-15 2017.**

Income :

Registration fees : 38800 Euros

Sponsorship Psi-K : 8000 Euros

Industrial sponsors : 1950 Euros

Contribution Synchrotron Soleil : 7000 Euros

Funding CNRS : 5500 Euros (7000 Euros – 1500 Euros administration)

=> Total income : 61250 Euros

Expenses :

Housing and board : 44900 Euros

Travel lecturers : 8560 Euros

Pedagogical materials : 2000 Euros

Coffee breaks : 4290 Euros

Food and beverages for poster sessions : 1500 Euros

=> Total expenses : 61250 Euros