

INTERNATIONAL SUMMER SCHOOL  
IN ELECTRONIC STRUCTURE THEORY

*ISTPC*

ELECTRON CORRELATION  
IN PHYSICS & CHEMISTRY

JUNE 14 - 27

2015

Centre Paul-Langevin  
Aussois – Savoie  
FRANCE







**The summer school is opened to PhD students, post-docs and researchers using or developing methods for electronic structure calculations.**

$$L(1,2;1',2') = L_0(1,2;1',2') + \int d3456 L_0(1,4;1',3) \bar{\Gamma}(3,6;4,5) L(5,2;6,2')$$

**The following topics will be covered:** Second quantization, density-functional theory (DFT), time-dependent DFT (TD-DFT), Hartree-Fock (HF) and post-HF methods, multi-configurational methods, multi-reference perturbation theory, model Hamiltonians, response theory, basics in solid physics, Green functions, Quantum Monte Carlo (QMC), density matrix renormalization group (DMRG), Random Phase Approximation (RPA), GW method, Bethe-Salpeter equation, Dynamical Mean Field Theory (DMFT).

$$G(xt, x't') = -i \langle N | T \psi(xt) \psi^\dagger(x't') | N \rangle$$

$$|\psi\rangle = \sum_{m,n} A_{mn} |\psi_m^L\rangle |\psi_n^R\rangle$$

$$|\Phi(k)\rangle = e^{-\hat{k}} |\Phi_0\rangle$$

$$E = \frac{\hat{H}\psi(x_1, x_2, \dots)}{\psi(x_1, x_2, \dots)}$$

$$\Sigma(12) = i \int G(13) \Gamma(324) W(41) d(34)$$

$$E_0 = \min_{\psi} \left\{ F[\psi] + \int d\mathbf{r} \psi_{ne}^*(\mathbf{r}) v(\mathbf{r}) \psi(\mathbf{r}) \right\}$$

One of the motivation for organizing such a school is to stimulate discussions between chemists and physicists on the problem of electron correlation.

Tutorials will be proposed every afternoon so that the participants can derive the key equations presented during the lectures. "Posters" and "evening discussion" sessions will also be organized.



*Looking forward to seeing you at the*  
**ISTPC 2015 SUMMER SCHOOL!**

**Local organizing committee:**

Chantal Daniel, Emmanuel Fromager and Vincent Robert,  
Laboratoire de Chimie Quantique, Institut de Chimie  
de Strasbourg.



Flash this QR-code for updates and practical informations  
<http://quantique.u-strasbg.fr/ISTPC2015>

CAES: [www.caes.cnrs.fr/vacances/nos-villages/centre-paul-langevin](http://www.caes.cnrs.fr/vacances/nos-villages/centre-paul-langevin)  
Aussois: [www.aussois.com](http://www.aussois.com)