Program Schedule for School Part-II
(14 - 17 Jan, 2014)

	9:00-10:30	10:30-11:00	11:00-12:30	12:30-14:00	14:00-15:30	15:30-1600	16:00-17:30	17:30-18:30
Tue. 14-th Jan	Georges	Coffee	Pruschke	Lunch	Ferrero	Coffee	Ferrero	Saha-Dasgupta
Wed. 15-th Jan	Aryasetiwan	Coffee	Aichhorn	Lunch	Millis	Coffee	Tut. on LDA+DMFT	Tut. on LDA+DMFT
Thurs 16-th Jan	Pruschke	Coffee	Biermann	Lunch	Aichhorn	Coffee	Tut. on LDA+DMFT	Tut. on LDA+DMFT
Fri. 17-th Jan	Werner	Coffee	Biermann	Lunch	Werner	Coffee	Tut. on LDA+DMFT	Tut. on LDA+DMFT

Details of the Lectures during the School Period

1. A Georges (College de France, Paris)
Sum up on DMFT for the school

2. T. Pruschke (Institute for Theoretical Physics, Gottingen, Germany)
Quantum Impurity Solvers
Introduction
-Introduction to the quantum impurity problem
-Kondo effect
-Anderson, Kondo models

Hamiltonian-based quantum impurity solvers
-Exact Diagonalization
-NRG/DMFT quantum impurity solvers
- Algorithm
- Pros and cons
- Applications

3. M. Ferrero (Ecole Polytechnique, Paris, France)
Analytical /approximate Solvers
-Iterated perturbation theory
-Hubbard 1

Action based solvers and tools
Interaction-expansion CTQMC
-Generic introduction about diagrammatic MC
-Algorithm
-Pros and Cons

Applications

4. P. Werner (University of Fribourg, Switzerland)

Hybridization-expansion-based CTQMC
-Segment code algorithm
-Matrix version of the algorithm
-Real-time CTQMC
-Pros and cons
-Applications

Analytic Continuation
-Pade approximants
-Maximum entropy method

5. M. Aichhorn (Technical University Graz, Austria)
LDA+DMFT

Part I:
-Introduction and basic concepts
-Wannier functions
-Setting up the impurity problem
-The LDA+DMFT loop
-How to deal with uncorrelated bands: The double counting problem

Part II:
-The DFT+DMFT in functional formulation
-The total energy functional
-Full charge self-consistency
-Applications

Tutorial on LDA+DMFT
http://ipht.cea.fr/triqs/

6. F. Aryasetiwan (Lund University, Sweden)

The GW method
Why do we need GW?
The self-energy and the GW approximation
Physical interpretation of the GW approximation
Self-consistent GW
Quasiparticle self-consistent GW
Difficulties with the GW approximation
Improving the GW approximation

References:
Hedin and Lundqvist, Solid State Physics vol 23 (1969)
Aryasetiawan and Gunnarsson, Rep. Prog. Phys. 61 (1998)

7. S. Biermann (École Polytechnique, Paris France)
The GW + DMFT Method

8. A Millis (Columbia University, USA)
An Introduction to Cluster DMFT