Correlated Electron Physics beyond the Hubbard Model

cecam Centre Européen de Calcul Atomique et Moléculaire 2019

Bremen Center for BCCMS Computational Materials Science

Tuesday, February 05th 2019
(House of Science Bremen/Downtown)

08:00	- 08:50	**Registration**	
08:50	- 09:00	**Opening and welcome, Tim Wehling**	
Session:		**Dynamical Mean Field Theory and diagrammatic extensions thereof**	
09:00	- 09:40	Philipp Werner, University of Fribourg (Switzerland)	*GW+DMFT simulation of lattice models in and out of equilibrium*
09:40	- 10:20	Alexander I. Lichtenstein, University of Hamburg (Germany)	*Nonlocal correlated effects in magnetic materials*
10:20	- 10:50	**Coffee Break**	
10:50	- 11:30	Erik van Loon, University of Bremen (Germany)	*Dual boson approach to spatial correlations*
11:30	- 12:10	James LeBlanc, Memorial University of Newfoundland, St. John's (Canada)	*Hubbard-like models: challenges and solutions via analytic treatments of numerical problems*
12:15	- 13:50	**Lunch Break (Restaurant Q1) and Coffee**	
Session:		**Quantum Cluster Approaches**	
13:50	- 14:30	Johannes Lischner, Imperial College London London,(United Kingdom)	*Many-body perturbation theory beyond GW*
14:30	- 15:00	**Coffee Break**	
15:00	- 15:40	André-Marie S. Tremblay, University of Sherbrooke, Québec (Canada)	*Antagonistic effects of nearest-neighbor repulsion on the superconducting pairing dynamics in the doped Mott insulator regime*
15:40	- 16:20	**Round Table Discussion -** Diagrammatic and cluster extensions of DMFT: where are we?	
18:20		**Pickup to Welcome Reception (The Bremen Town Musicians, the Statue near the town hall**	
18:30	- 21:30	**Welcome Reception (Bremen Town Hall)**	

Wednesday, February 06th 2019
(House of Science Bremen/Downtown)

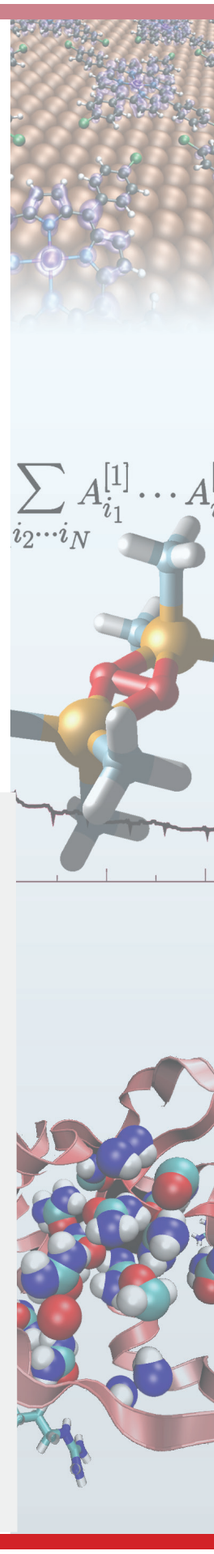
Session:		**Coupled cluster, FCIQMC and related quantum chemical approaches**	
09:00	- 09:40	Lucas K. Wagner, University of Illinois at Urbana-Champaign, Illinois (USA)	*Model Hamiltonians from ab-initio quantum Monte Carlo calculations*
09:40	- 10:20	George Booth, King's College London (United Kingdom)	*'Static' mean-field theory, 'Dynamical' mean-field theory, and 'Static Dynamical' mean-field theory*
10:20	- 10:50	**Coffee Break**	
10:50	- 11:30	Silke Biermann, Ecole Polytechnique, Palaiseau (France)	*Non-local interactions and non-local correlations: examples of dynamical mean field calculations for realistic materials*
11:30	- 12:10	Tianyu Zhu, California Institute of Technology, Pasadena, California (USA)	*Correlated Green's functions in materials: towards an ab initio treatment of the Kondo problem*
12:10	- 13:50	**Lunch Break (Restaurant Q1) and Coffee**	
Session:		**Constrained many-body perturbation theory, density functional theory and related methods I**	
13:50	- 14:30	Matteo Cococcioni, Swiss Federal Institute of Technology, Lausanne (Switzerland)	*Ab initio modeling of transition metal compounds using the extended DFT+U+V with self-consistent Hubbard parameters*
14:30	- 15:10	Ferdi Aryasetiawan, Lund University (Sweden)	*The impact of long-range interaction on the electronic structure of correlated materials*
15:10	- 15:50	Malte Rösner, Radboud University, Nijmegen (The Netherlands)	*cRPA simulations of layered materials*
15:50	- 16:20	**Coffee Break**	
16:20	- 17:00	Ryotaro Arita, University of Tokyo (Japan)	*Self-energy variational approach to correlated electron systems*
17:00	- 17:40	Malte Schüler, University of Bremen (Germany)	*The Peierls-Feynman variational principle: applications to the extended Hubbard model and real materials*
17:40	- 18:20	**Round Table Discussion -** Towards real materials: all ab-initio versus hybrid approaches in the wave function, Green function and density functional domain	
18:40		**Bus Pickup to Conference Dinner (Radisson Blu Hotel, Wachtstraße)**	
19:00	- 22:30	**Conference Dinner (Restaurant Juergenshof)**	

Thursday, February 07th 2019
(House of Science Bremen/Downtown)

Session:		**Lattice Quantum Monte Carlo**	
09:00	- 09:40	Stefan Wessel, RWTH Aachen University (Germany)	*Nonlocal density interactions in auxiliary-field quantum Monte Carlo simulations*
09:40	- 10:20	Thomas Devereaux, Stanford University, California (USA)	*Metallic transport, CDWs, and pairing without quasiparticles in the Hubbard model*
10:20	- 10:50	**Coffee Break**	
10:50	- 11:30	Andrew Millis, Flatiron Institute, City of New York, New York (USA)	*Ground-state properties of the Hydrogen chain, and beyond*
11:30	- 12:10	Sandro Sorella, International School for Advanced Studies (SISSA), Trieste (Italy)	*New insights in the sign problem within the auxiliary field quantum Monte Carlo technique*
12:10	- 13:50	**Lunch Break (Restaurant Q1) and Coffee**	
Session:		**Diagrammatic Monte Carlo**	
13:50	- 14:30	Boris Svistunov, University of Massachusetts Amherst, Massachusetts (USA)	*Polynomial complexity despite the fermionic sign*
14:30	- 15:10	Nikolay Prokofiev, University of Massachusetts Amherst, Massachusetts, (USA)	*Dirac liquids and interacting topological insulators by Diagrammatic Monte Carlo*
Session:		**Functional Renormalization Group**	
15:10	- 15:50	Sabine Andergassen, University of Tübingen (Germany)	*Multiloop functional renormalization group for response functions*
15:50	- 16:30	Shan-Wen Tsai, University of California Riverside, California (USA)	*Effects of retardation in the renormalization group approach to interacting fermions*
17:25		**Poster Mounting**	
17:30	- 21:00	**Poster Session + Catering Buffet (House of Science)**	

Friday, February 08th 2019
(House of Science Bremen/Downtown)

Session:		**Constrained many-body perturbation theory, density functional theory and related methods II**	
09:00	- 09:40	Carsten Honerkamp, RWTH Aachen University (Germany)	*Effective interactions from cfRG*
09:40	- 10:20	Alexander Steinhoff, University of Bremen (Germany)	*GW+T-Matrix approach to the excitonic Mott transition*
10:20	- 10:50	**Coffee Break**	
10:50	- 11:30	Mark van Schilfgaarde, King's College London (United Kingdom)	*QSGW+DMFT: accurate, nearly ab initio many-body treatment of strong correlations*
11:30	- 12:30	**Concluding Round Table Discussion -** How to approach correlated materials with non-local interactions realistically: next steps	
12:30	- 12:45	**Closing words and departure**	



Conference Organisers

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