Program of the International CECAM-Workshop
"Correlated electron physics beyond the Hubbard model"
Bremen Center for Computational Materials Science – BCCMS
University of Bremen, February 4th - 8th 2019
Conference site: House of Science, Downtown

Monday, February 4th 2019 (Radisson Blu Hotel Bremen)

18:00 – 21:00 Registration

Tuesday, February 5th 2019 (House of Science Bremen, Downtown)

08:00 – 08:50	**Registration**
08:50 – 09:00	**Opening and welcome, Tim O. Wehling**
Session:	**Dynamical Mean Field Theory and diagrammatic extensions thereof**
	Chair: Andrew Millis
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 P. F. LeBlanc, Memorial University of Newfoundland, St. John's, Canada *Hubbard-like models: challenges and solutions via analytic treatments of numerical problems*
12:10 – 12:15	**Group Photo**
12:15 – 13:50	**Lunch Break (Restaurant Q1) and Coffee**
Session:	**Quantum Cluster Approaches**
	Chair: Silke Biermann
13:50 – 14:30	Johannes Lischner, Imperial College 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)

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Wednesday, February 6th 2019 (House of Science Bremen, Downtown)

Session:			**Coupled cluster, FCIQMC and related quantum chemical approaches**
			Chair: Philipp Werner
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, University of Cambridge, 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**
			Chair: Shan-Wen Tsai
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*

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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, Wachtstraße)
19:00	**–**	**22:30**	**Conference Dinner** (Restaurant Juergenshof)

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Thursday, February 7th 2019 (House of Science Bremen, Downtown)

Session:			**Lattice Quantum Monte Carlo**
			Chair: Johannes Lischner
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**
			Chair: Ryotaro Arita
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)

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Friday, February 8th 2019 (House of Science Bremen, Downtown)

Session:			**Constrained many-body perturbation theory, density functional theory and related methods II**
			Chair: Tim O. Wehling
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**