



**Density Functionals for
Many-Particle Systems:
Mathematical Theory and Physical Applications
of Effective Equations**

[09 - 13 Sep 2019]

Partially supported by Julian Schwinger Foundation
Session 2: Coordinators: Kieron Burke and Volker Bach

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Venue:

IMS Auditorium

Admission is free



3 Prince George's Park Singapore 118402
ims.nus.edu.sg

Density Functionals for Many-Particle Systems: Mathematical Theory and Physical Applications of Effective Equations

Session 2 (09 - 13 Sep 2019)

Coordinators: Kieron Burke and Volker Bach

Venue:

IMS Auditorium, 3 Prince George's Park Singapore 118402

Monday, 09 September 2019

Time	Title
0945 - 1000	Registration
1000 - 1045	Opening Remarks
1045 - 1100	Coffee Break
1100 - 1145	Peter Pickl: Corrections to the mean-field description
1145 - 1200	Coffee Break
1200 - 1330	Sergei Manzhos: Tutorial on Machine learning for kinetic energy functionals
1330 - 1500	Lunch Break
1500 - 1545	David Tozer: Density scaling in density functional theory
1545 - 1630	Mel Levy: DFT and Density Matrix Functionals

Tuesday, 10 September 2019

Time	Title
0945 - 1000	Registration
1000 - 1045	Andreas Savin: Some open questions require input from mathematicians: 1. Are density functionals approximations/extrapolations connected to density functional theory? 2. Elementary statistics of benchmarking density functional approximations.
1045 - 1100	Coffee Break
1100 - 1200	<i>Distinguished Visitor Lecture Series</i> Kieron Burke: Semiclassical origins of density functional approximations
1200 - 1230	Coffee Break
1230 - 1330	<i>Distinguished Visitor Lecture Series</i> Mel Levy: On the History, Variational Foundations, and Evolution of Time-Independent Density-Functional Theory
1330 - 1500	Lunch Break
1500 - 1545	Leeor Kronik: Optimally-tuned range-separated hybrid functionals: An approach to theoretical spectroscopy using density functional theory
1545 - 1630	Su Ying Quek: Energy Level Alignment and Dielectric Screening at Complex Interfaces

Tuesday, 10 September 2019	
Time	Title
1630 - 1645	Coffee Break
1645 - 1730	Weitao Yang: Quasiparticle and Excitation Energies from Ground State DFT Calculations – after the Elimination of the Systematic Delocalization Error
Wednesday, 11 September 2019	
Time	Title
0900 - 0915	Registration
0915 - 1000	Doron Gazit: Analytic Z expansion for the relativistic Thomas Fermi model as a validation of KS-DFT approach
1000 - 1045	Konstantin Merz: On the strong Scott conjecture for Chandrasekhar atoms
1045 - 1100	Coffee Break
1100 - 1145	Yukimi Goto: Binding of atoms in Müller theory
1145 - 1330	Lunch Reception at IMS
1330 - 1800	Social Event: Sungei Buloh Wetland Reserve
Thursday, 12 September 2019	
Time	Title
0900 - 0915	Registration
0915 - 1000	Sergey Morozov: On the eigenvalues in the gap of Dirac operators with a Coulomb type singularity
1000 - 1045	Dirk Hundertmark: Quantum systems at the brink: Existence and decay of bound states for at thresholds. Helium.
1045 - 1100	Coffee break
1100 - 1145	Martin Trappe: Applications and perspectives of density-potential functional theory
1145 - 1200	Coffee Break
1200 - 1330	Chuck Witt: Tutorial on Alternative versions of orbital-free DFT
1330 - 1500	Lunch Break
1500 - 1545	Berthold Englert: DFT in Momentum Space
1545 - 1630	Discussion Session

Friday, 13 September 2019

Time	Title
0900 - 0915	Registration
0915 - 1000	Volker Bach: Review on Correlation Inequalities and Representability Conditions
1000 - 1045	Robert Rauch: Reducing fermion density matrices: a geometric view
1045 - 1100	Coffee Break
1100 - 1145	Jerzy Cioslowski: Bilinear Constraints upon the Correlation Contribution to the Electron-Electron Repulsion Energy as a Functional of the One-Particle Reduced Density Matrix
1145 - 1330	Lunch Break
1330 - 1430	<i>Distinguished Visitor Lecture Series</i> Kieron Burke: Explicit corrections to the gradient expansion for the kinetic energy in one dimension
1430 - 1500	Coffee Break
1500 - 1630	Discussion Session