Curriculum Vitae

Surname	ASSAAD.
First names	FAKHER, FAKHRY.
Title	Prof. Dr.
Nationality	Swiss
Date of birth	Geneva, November 3rd, 1964.
First language	French.
Foreign languages	English, German.

Areas of Research

- Computational quantum many body physics
- Strongly correlated electron systems
- Development and investigation of numerical tools

Scientific Career

1983 – 1988	Study of physics at the ETH Zürich.
	Title of diploma thesis: Graph Expansion of the Hubbard Model. Comparison with Quantum Field Theoretical Models.
	Supervisors: Prof. T.M. Rice and Prof. F. Rys.
1988 – 1991	PhD at the ETH Zürich.
	Title of PhD thesis: On Quantum Monte Carlo and Strongly Correlated Electron Systems.
	Supervisors: Prof. T.M. Rice and PD D. Würtz.
1991 – 1993	Postdoctoral fellow. University of Würzburg, group of Prof. W. Hanke.
1994 – 1995	Postdoctoral fellow. University of Tokyo, ISSP (Insitute for Solid State Physics) group of Prof. M. Imada.
1996 – 1997	Postdoctoral fellow. University of California, Santa-Barbara, group of Prof. D. J. Scalapino.
1997 – 2000	Assistant position at the university of Stuttgart.
1998	*Habilitation* in theoretical physics at the University of Stuttgart.
	Habilitationsschrift: Metal-insulator transition in two-dimensional Hubbard and extended Hubbard models: a numerical study.
	Habilitationsvortrag: Neutrino Oscillations and Mass
2000 – 2001	*Hochschuldozent* at the University of Stuttgart
2001 – 2003	Heisenberg Fellow
2003	Prof. (C3) at the University of Würzburg

Fellowships, awards and services to the community

1991	Second Prize of the Seymour Cray Switzerland Competition. Award received for 'Exact Diagonalization and Monte Carlo for Strongly Correlated Fermions: Phase Diagram of the one-dimensional t-J model' in collaboration with M. Ogata, M.U. Luchini, S. Sorella and D. Würtz
1995	Research fellowship from the Japan Society for the Promotion of Science (January 1995 - December 1995)
1996	Research fellowship from the Swiss National Science Foundation (February 1996 - July 1997)
2000	Heisenberg stipend awarded by the DFG (Deutsche Forschungsgemeinschaft)
2009	Co-spokesman of the research unit FOR1162, Electron induced phenomena in surfaces and interfaces with tunable interactions. Spokesman Prof. Dr. R. Claessen
2011	Spokesman of the research unit FOR1807, Advanced Computational Methods for Strongly Correlated Quantum Systems. The research unit will be funded as of January 1, 2013.
2012	Project proposal for computational resources was awarded the John von Neumann Exzellenz-Projekt 2012 prize. (Two projects are chosen each year).

Grants

1998	PhD position obtained in the framework of a priority programme of the *Deutsche Forschungsgemeinschaft* on 'Collective quantum states in electronically one-dimensional transition metal compounds'. Application was done in collaboration with Prof. Dr. A. Muramatsu. Duration of grant: 2 years.
2000	Grant from the *Deutsche akademischer Austauschdienst* (DAAD) for a project based personnel exchange programme with France (PROCOPE). Title: Quantum Monte Carlo simulations of fermionic and bosonic lattice models. In collaboration with: G. Batrouni, Université de Nice-Sophia Antipolis, Institut non-linéaire de Nice. Duration of grant: 2 years.
2001	PhD position (BaT IIA/2) from the *Deutsche Forschungsgemeinschaft* . Title of grant: 'Quantum Monte Carlo simulations of Kondo lattice models.' Duration of grant: 2 years. (Ref. Num: AS 120/3-1)
2003	PhD position (BatIIa 3/4) obtained from the DFG. Title of grant: Investigation and development of new numerical methods for correlated electron systems. Duration of grant: 2 years. (Ref. Number AS 120/4-1)
2004	PhD position (BatIIa 1/2) obtained from the DFG in the framework of the FG 538 on *Doping Dependence of Phase Transitions and Ordering Phenomena in Cuprate Superconductors* . The grant proposal has been carried out in collaboration with Prof. W. Hanke, P.D. M. Potthoff and Prof. E. Arrigoni.

2006	Position (BatIIa 1/1) obtained from the DFG. Title of grant: Investigation and development of new numerical methods for correlated electron systems.
	Duration of grant: 2 years (Ref. Number AS 120/4-2)
2007	Grant from the *Deutsche akademischer Austauschdienst* (DAAD) for a project based personnel exchange programme with France (PROCOPE). Title: Numerical simulations of correlated materials. In collaboration with: S. Capponi, Université Paul Sabatier.
	Duration of grant: two years.
2007	Humboldt Postdoctoral fellowship used to fund Dr. K. Beach.
	Duration of grant: one year
2008	Humboldt Postdoctoral fellowship used to fund Dr. M. Raczkowski.
	Duration of grant: two years.
2009	Position (BatIIa 1/1) obtained from the DFG. Title of grant: Investigation and development of new numerical methods for correlated electron systems.
	Duration of grant: 2 years. (Ref. Number AS 120/4-3)
2009	Co-speaker and participant in the research unit FOR1162 entitled: Electron Correlation induced phenomena in surfaces and interfaces with tunable interactions.
	Speaker: Prof. R. Claessen.
	Title of project: Phase diagram and single-particle spectral functions for heavy fermion surface-systems and one-dimensional nanowires.
	Obtained funds: two doctoral positions (1.5 E13) for 3 years. (Ref. Number AS 120/6-1)
2010	Participant in the research unit entitled: Dynamical mean field approach with predictive power for strongly correlated materials.
	Speaker: Prof. D. Vollhardt (co-speaker Prof. A. Lichtenstein)
	Title of project: QMC impurity solvers for multi-orbital problems and frequency-dependent interactions
	In collaboration with P. Werner (ETHZ) and N. Blümer (Mainz).
	Obtained funds: 0.5 E13 per PI for 3 years (Ref. Number AS 120/8-1)
2011	Position (1 E13) obtained from the DFG. Title of grant proposal: Action-Based Quantum Monte Carlo Approach to Fermion-Boson Lattice Models.
	This grant proposal was written in collaboration with Dr. M. Hohenadler. The duration of the grant is of two years and will fund Dr. Hohenadler's position. Grant Number: HO14489/2-1.

Publication List

H-Index : 23 (Source: Goolge Scholar)

1. **F.F. Assaad** and Ph. de Forcrand, Proceedings of 'Quantum Simulations of Condensed Matter', Los Alamos (1989).
   Antithetic Langevin Variables: a way to solve the Fermionic Sign Problem?

2. **F.F. Assaad**, HPA **63**, 580, (1990).
   Quantum Monte Carlo Simulations of the two-dimensional single band Hubbard Model.

3. **F.F. Assaad** and D. Würtz, Z. Phys. B **80** 325, (1990)
   Reinvestigation of the Sign Problem in the two-dimensional Hubbard model.

4. **F.F. Assaad** and D. Würtz, HPA **63** 841, (1990).
   Numerical Simulations of the one-dimensional t-J model.

5. M. Ogata, M.U. Luchini, S. Sorella and **F.F. Assaad**, Phys. Rev. Lett. **66**, 2388, (1991).
   Phase Diagram of the one-dimensional t-J model.

6. **F.F. Assaad** and D. Würtz, Phys. Rev. B **44**, 2681, (1991).
   Charge and Spin Structures in the one-dimensional t-J model.

7. M. Troyer, **F.F. Assaad** and D. Würtz, Proceedings of the 'Gordon Godfrey Workshop on Condensed Matter Physics: Strongly Correlated Electron Systems' Sydney, 1991, Nova Publications, New York.
   Strongly Correlated Fermions in the t-J and t-J-J' models.

8. M. Troyer, **F.F. Assaad** and D. Würtz, HPA **64**, 942, (1991).
   Disconnected Cluster approach for Quantum Monte Carlo Simulations.

9. **F.F. Assaad**, Phys. Rev. B **47**, 7910, (1993).
   Spiral States in the Three-Band Hubbard Model: a Hartree-Fock and Variational Quantum Monte Carlo Approach.

10. **F.F. Assaad**, W. Hanke and D.J. Scalapino, Phys. Rev. Lett. **71**, 1915 (1993).
    Flux Quantization in the Two-Dimensional Repulsive and Attractive Hubbard models.

11. **F.F. Assaad**, W. Hanke and D.J. Scalapino, Phys. Rev. B **49**, 4327 (1994).
    Temperature Derivative of the Superfluid Density in the Attractive Hubbard Model.

12. R. Preuss, A. Muramatsu, W. von der Linden, P. Dieterich, **F.F. Assaad** and W. Hanke, Phys. Rev. Lett. **73**, 732, (1994)
    Spectral properties of the one-dimensional Hubbard model

13. **F.F. Assaad**, R. Preuss, A. Muramatsu and W. Hanke. Jour. of Low Temp. Physics. **95**, 251 (1994).
    Quantum Monte Carlo Simulations of Hubbard Type Models.

14. R. Preuss, **F.F. Assaad**, A. Muramatsu and W. Hanke, in 'Superconductivity and strongly correlated electron systems' ed. by C. Noce, A. Romano, and G. Scarpetta. Singapore ; River Edge, N.J. World Scientific, (1994).
    Hubbard models, a Quantum Monte Carlo study.

15. R. Preuss, **F.F. Assaad**, A. Muramatsu and W. Hanke. in 'The Hubbard Model: its Physics and Mathematical Physics' ed. D. Baeriswyl. New York : Plenum Press, (1995). NATO ASI series. Series B, Physics
    Quantum-Monte-Carlo studies of one- and two-dimensional Hubbard models

16. A. Muramatsu, R. Preuss, W. von der Linden, P. Dieterich, **F.F. Assaad** and W. Hanke, Computer Simulations in Condensed Matter Physics VII, Eds. D.P. Landau, K.K. Mon, H.B. Schüttler, Springer Verlag, Heidelberg, Berlin, 1994.
Excitation spectra in the 1-D Hubbard model from Quantum Monte Carlo Simulations.

17. **F.F. Assaad**, W. Hanke and D.J. Scalapino, Phys. Rev. B **50**, 12835, (1994)
Flux Quantization and Temperature Derivative of the Superfluid Density as Criteria for Superconductivity in Two-Dimensional Hubbard models.

18. **F.F. Assaad** and S. Biskamp, Phys. Rev. B **51**, 1605, (1995).
Fractional Quantum Hall Effect on a Lattice.

19. **F.F. Assaad** and M. Imada, Phys. Rev. Lett. **74**, 3868, (1995).
Hall Coefficient for the Two-Dimensional Hubbard Model.

20. **F.F. Assaad** and M. Imada, J. Phys. Soc. Jpn. **65**,189, (1996).
Stable Quantum Monte Carlo Algorithm for $T = 0$ Calculation of Imaginary Time Green Functions

21. **F.F. Assaad** and M. Imada, Phys. Rev. Lett. **76**, 3176, (1996).
Insulator-Metal Transition in the One and Two-Dimensional Hubbard Models.

22. **F.F. Assaad** and M. Imada, Proceedings of 'Frontiers of High T_c Superconductivity', Morioka, Japan, (1995). Physica C **263**, 78, (1996)
High Frequency Hall Coefficient for the Two-dimensional Hubbard Model

23. N. Furukawa, **F.F. Assaad**, and M. Imada, J. Phys. Soc. Jpn **65**, 2339, (1996)
Critical Exponents of the Metal-Insulator Transition in the Two-Dimensional Hubbard Model.

24. **F.F. Assaad**, M. Imada and D.J. Scalapino, Phys. Rev. Lett. **77**, 4592, (1996)
Quantum Transition between an Antiferromagnetic Mott Insulator and $d_{x^2-y^2}$ Superconductor in Two Dimensions.

25. H. Endres, W. Hanke, H.G. Evertz and **F.F. Assaad** Phys. Rev. Lett. **78**, 160, (1997)
Comment on 'Quantum Monte Carlo Evidence for Superconductivity in the Three-Band Hubbard Model in Two Dimensions'.

26. **F.F. Assaad**, M. Imada and D.J. Scalapino, Phys. Rev. **B 56**, 15001, (1997)
Charge and Spin Structures of a $d_{x^2-y^2}$ Superconductor in the Proximity of an Antiferromagnetic Mott Insulator.

27. **F.F. Assaad** and M. Imada, Phys. Rev. **B 58**, 1845, (1998)
Doping induced metal-insulator transition in two-dimensional Hubbard, t-U, and extended Hubbard, t-U-W, models.

28. **F.F. Assaad**, High performance computing in science and engineering 1998. Eds. E. Krause and W. Jäger, Springer-Verlag, Berlin, Heidelberg, New-York 1998.
The interplay between d-wave superconductivity and antiferromagnetic fluctuations: a quantum Monte Carlo study

29. **F.F. Assaad**, High performance computing in science and engineering 1998. Eds. E. Krause and W. Jäger, Springer-Verlag, Berlin, Heidelberg, New-York 1998.
SU(2)-spin Invariant Auxiliary Field Quantum Monte Carlo Algorithm for Hubbard models.

30. M. Imada, **F.F. Assaad**, H. Tsunetsugu, and Y. Motome, in Physics and Chemistry of Transition Metal Oxides, ed. by H. Fukuyama and N. Nagaosa (Springer Verlag, Berlin, 1999) p.120.
Metal-Insulator and Superconductor-Insulator Transitions in Correlated Electron Systems.

31. **F.F. Assaad** and M. Imada
Eur. Phys. J. **B 10**, 595 (1999) (Rapid Note)
Unusually flat hole dispersion relation in the two-dimensional Hubbard model and restoration of coherence by addition of pair-hopping processes.

32. M. Brunner, **F.F. Assaad** and A. Muramatsu, Eur. Phys. J. **B 16**, 209 (2000) (Rapid Note)
Single hole dynamics in the one dimensional t-J model.

33. **F.F. Assaad**, Phys. Rev. Lett **83**, 796 (1999).
Quantum Monte Carlo simulations of the half-filled two-dimensional Kondo lattice model.

34. M. Brunner, **F. F. Assaad** and A. Muramatsu, Phys. Rev. B **62**, 15480 (2000), (e-preprint cond-mat/0002321)
Single hole dynamics in the t-J model on a square lattice.

35. T. Eckl, E. Arrigoni, W. Hanke and **F. F. Assaad**, Phys. Rev. B **62**, 12395 (2000), (e-preprint cond-mat/0004171)
t-U-W Model of a $d_{x^2-y^2}$ Superconductor in the Proximity of an AF Mott Insulator: Diagrammatic Studies vs. QMC Simulations

36. P. Haas, E. Griesshaber, B. Gorshunov, D. Schweitzer, M. Dressel and **F.F. Assaad**, Phys. Rev. B. Rapid Commun. **62**, R14673 (2000), (e-preprint cond-mat/0006358)
Correlation gap in the optical spectra of the two-dimensional organic metal (BEDT-TTF)$_4$[Ni(dto)$_2$]

37. C. Lavalle, M. Brunner, **F.F. Assaad** and A. Muramatsu High performance computing in science and engineering 2000. Eds. E. Krause und W. Jäger, Springer-Verlag, Berlin, Heidelberg, New-York 2000. ISBN 3-540-41213-1
Dynamical properties of the t-J model.

38. M. Feldbacher and **F.F. Assaad**, Phys. Rev. B. **63**, 073105 (2001), (e-preprint cond-mat/0009447)
Efficient calculation of imaginary times displaced correlation functions in the projector auxiliary field quantum Monte-Carlo algorithm.

39. S. Capponi and **F.F. Assaad**, Phys. Rev. B **63**, 155114, (2001). (e-preprint cond-mat/0010393)
Spin and charge dynamics of the ferromagnetic and antiferromagnetic two-dimensional half-filled Kondo lattice model.

40. M. Brunner, S. Capponi, **F.F. Assaad** and A. Muramatsu. Phys. Rev. B **63**, R180511 (2001) (e-preprint cond-mat/0101462)
Single hole dynamics in the $t-J$ model on two- and three-leg ladders.

41. M. Brunner, C. Lavalle, S. Capponi, M. Feldbacher, **F. F. Assaad** and A. Muramatsu. High performance computing in science and engineering 2001. Eds. E. Krause und W. Jäger, Springer-Verlag, Berlin, Heidelberg, New-York 2000. ISBN 3-540-42675-2
Single hole dynamics in correlated insulators.

42. **F.F. Assaad**, Phys. Rev. B **65** 115104 (2002) e-preprint cond-mat/0104126
Depleted Kondo Lattices: mean-field and Quantum Monte Carlo calculations.

43. M. Feldbacher, C. Jurecka, **F. F. Assaad** and W. Brenig Phys. Rev. B **66**, 045103 (2002), (e-preprint cond-mat/0107037)
Single-hole dynamics in the half-filled two-dimensional Kondo-Hubbard model.

44. **F. F. Assaad** Lecture notes of the Winter School on Quantum Simulations of Complex Many-Body Systems :From Theory to Algorithms. Edited by : J. Grotendorst, D. Marx and A. Muramatsu. Publication Series of the John von Neumann Institute for Computing (NIC). NIC series Vol. 10. ISBN 3-00-009057-6, 2002.
Quantum Monte Carlo Methods on Lattices: The Determinantal method. Pages 99-155.

45. **F. F. Assaad**, V. Rousseau, F. Hébert, M. Feldbacher and G. G. Batrouni
Spin and charge dynamics of stripes in doped Mott insulators.
Europhys. Lett., 63 (4) , pp. 569-575 (2003), (e-preprint cond-mat 0206287).

46. C. Lavalle, M. Arikawa, S. Capponi, **F. F. Assaad** and A. Muramatsu
Antiholons in one-dimensional t-J models.
Phys. Rev. Lett. 90, 216401 (2003), (e-preprint cond-mat/0211054).

47. C. Lavalle, M. Rigol, M. Feldbacher, **F. F. Assaad** and A. Muramatsu
High performance computing in science and engineering 2002. Eds. E. Krause und W. Jäger, Springer-Verlag, Berlin, Heidelberg, New-York 2000. ISBN 3-540-43860-2
Thermodynamics and Dynamics of Correlated Electron Systems.

48. M. Feldbacher, **F.F. Assaad**, F. Hebert and G. G. Batrouni
Coexistence of s-wave Superconductivity and Antiferromagnetism.
Phys. Rev. Lett. 91, 056401 (2003), (e-preprint, cond-mat/0212244)

49. I.Milat, **F.F. Assaad** and M. Sigrist
Field induced magnetic ordering transition in Kondo insulators
Eur. Phys. J. B **38** (2004) p. 571 (e-preprint, cond-mat/0312450)

50. **F. F. Assaad**
Coherence scale of the two-dimensional Kondo Lattice model.
Phys. Rev. B **70**, 020402 (2004) (e-preprint, cond-mat/0401096)

51. M. Feldbacher, K. Held and **F.F. Assaad**
Projective Quantum Monte Carlo Method for the Anderson Impurity Model and its Application to Dynamical Mean Field Theory.
Phys. Rev. Lett. **93**, 136405 (2004) (e-preprint, cond-mat/0406074)

52. **F. F. Assaad**
Phase diagram of the half-filled two-dimensional SU(N) Hubbard-Heisenberg model: a quantum Monte Carlo study.
Phys. Rev. B **71**, 075103 (2005) (e-preprint cond-mat/0406074)

53. G.G. Batrouni, **F. F. Assaad**, R.T. Scalettar and P.J.H. Denteneer
Dynamic response of trapped ultracold bosons on optical lattices.
Phys. Rev. A **72**, 031601 (2005) (e-prerint cond-mat/0503371)

54. **F. F. Assaad**, P. Werner, P. Corboz, E. Gull and M. Troyer
Symmetry projection schemes for Gaussian Monte Carlo methods.
Phys. Rev. B **72**, 224518 (2005) (e-preprint cond-mat/0509149)

55. **F. F. Assaad**, P. Corboz, E. Gull, W. P. Petersen, M. Troyer and P. Werner,
Gaussian Quantum Monte Carlo methods with symmetry projections.
AIP Conference Proceedings **816** 204 (2005).

56. A. Abendschein and **F. F. Assaad**
Temperature dependence of spectral functions for the one-dimensional Hubbard model: comparison with experiments.
Phys. Rev. B **73**, 165119 (2006) (e-preprint cond-mat/0601222)

57. C. Brünger and **F. F. Assaad**
Single hole dynamics in the Kondo Necklace and Bilayer Heisenberg models on a square lattice.
Phys. Rev. B **74**, 205107, (2006) (e-preprint cond-mat/0605396)

58. S. Capponi and **F. F. Assaad**
Spin nematic phases in models of correlated electron systems: a numerical study
Phys. Rev. B **75**, 045115, (2007)

59. **F. F. Assaad** and H.G. Evertz
Heraeus Summer School, Greifswald 18-29 Sept. 2006.
Computational Many Particle Physics, Lecture Notes in Physics 739, pp. 277, Springer Berlin Heidelberg 2007
Lecture Notes. World line and determinantal Quantum Monte Carlo methods for spins, phonons, and electrons.

60. **F. F. Assaad** and T. Lang
Phys. Rev. B **76**, 035116 (2007)
Diagrammatic Determinantal methods: projective schemes and applications to the Hubbard-Holstein model.

61. **F.F. Assaad** and M. Troyer
in Handbook of Magnetism and Advanced Magnetic Materials Vol. 1 (John Wiley and Sons, 2007)
Helmut Kronmüller (Editor), Stuart Parkin (Editor)
ISBN: 978-0-470-02217-7
The Quantum Monte Carlo Method

62. C. Brünger, **F. F. Assaad**, S. Capponi, F. Alet, D. N. Aristov and M. N. Kiselev
Phys. Rev. Lett. **100**, 017202 (2008)
Spin gap and string order parameter in the ferromagnetic Spiral Staircase Heisenberg Ladder: a quantum Monte Carlo study.

63. P. Corboz, A. Kleine, **F. F. Assaad**, I. P. McCulloch, U. Schollwöck and M. Troyer
Recent results from the Gaussian Quantum Monte Carlo method for fermions with symmetry projection
Phys. Rev. B **77**, 085108 (2008)

64. A. Laeuchli, S. Capponi and **F.F. Assaad**
J. Stat. Mech. (2008) P01010
Dynamical dimer correlations at bipartite and non-bipartite Rokhsar-Kivelson points

65. L.C. Martin and **F.F. Assaad**
Evolution of the Fermi Surface across a Magnetic Order-Disorder Transition in the Two-Dimensional Kondo Lattice Model: A Dynamical Cluster Approach
Phys. Rev. Lett. **101**, 066404 (2008)

66. S. Hochkeppel,**F.F. Assaad** and W. Hanke
A Dynamical Quantum Cluster Approach to Two-Particle Correlation Functions in the Hubbard Model.
Phys. Rev. B **77**, 205103 (2008)

67. K. S. D. Beach and **F.F. Assaad**
Coherence and metamagnetism in the two-dimensional Kondo lattice model.
Phys. Rev. B **77**, 205123 (2008)

68. **F.F. Assaad**
Spin, charge and single-particle spectral functions of the one-dimensional quarter filled Holstein model.
Phys. Rev. **78**, 155124 (2008).

69. M. Bercx, T. C. Lang and **F. F. Assaad**
Magnetic field induced semimetal-to-canted-antiferromagnet transition on the honeycomb lattice
Phys. Rev. B **80**, 045412 (2009).

70. K.S.D. Beach and **F. F. Assaad**
Bilayer Hubbard model for 3He: a cluster dynamical mean-field calculation
http://xxx.lanl.gov/abs/0905.1127

71. D.J.Luitz and **F. F. Assaad**
A weak coupling CTQMC study of the single impurity and periodic Anderson models with s-wave superconducting baths
Phys. Rev. B **81**, 024509 (2010)
http://xxx.lanl.gov/abs/0909.2656

72. M. Raczkowski, P. Zhang, **F. F. Assaad**, T. Pruschke, M. Jarrell
Phonons and the coherence scale of models of heavy fermions
Phys. Rev. B **81**, 054444 (2010)
http://xxx.lanl.gov/abs/0910.2954

73. Hélène Feldner, Andreas Honecker, Daniel Cabra, Stefan Wessel, Zi Yang Meng, **F. F. Assaad**
Edge Magnetism in Graphene: Mean-Field Theory compared with Exact Diagonalization and Quantum Monte Carlo Simulation
Phys. Rev. B **81**, 115416 (2010)
http://xxx.lanl.gov/abs/0910.5360

74. Dimitrios Galanakis, Shuxiang Yang, **Fakher Assaad**, Mark Jarrell, Philip Werner, Matthias Troyer
Comment on "Exact bosonization for an interacting Fermi gas in arbitrary dimensions"
Phys. Rev. Lett **105** , 159701 (2010)
http://xxx.lanl.gov/abs/0911.5155

75. Z. Y. Meng, T. C. Lang, S. Wessel, **F. F. Assaad** and A. Muramatsu
Quantum spin liquid emerging in two-dimensional correlated Dirac fermions
Nature 464, 847-851 (8 April 2010) doi:10.1038/nature08942 Article

76. L.C.Martin, M.Bercx and **F.F.Assaad**
Fermi surface topology of the two-dimensional Kondo lattice model: a dynamical cluster approximation approach
Phys. Rev. B **82**, 245105 (2010)

77. M. Raczkowski and **F.F.Assaad**
Melting of stripe phases and its signature in the single-particle spectral function
Phys. Rev. B **82**, 233101 (2010)

78. D. N. Aristov, C. Brünger, **F. F. Assaad** , M. N. Kiselev, A. Weichselbaum, S. Capponi and F. Alet
Asymmetric spin-1/2 two-leg ladders
Phys. Rev. B **82**, 174410 (2010)

79. K. S. D. Beach and **F. F. Assaad**
Phys. Rev. B **83**, 045103 (2011)
Orbital-selective Mott transition and heavy fermion behavior in a bilayer Hubbard model for 3He

80. M. Hohenadler, T. C. Lang and **F. F. Assaad**
Phys. Rev. Lett. **106**, 100403 (2011)
Correlation Effects in Quantum Spin Hall Insulators: a Quantum Monte Carlo Study

81. H. Feldner, Z. Y. Meng, T. C. Lang, **F. F. Assaad**, S. Wessel and A. Honecker
Phys. Rev. Lett. **106**, 226401 (2011)
Dynamical Signatures of Edge-State Magnetism on Graphene Nanoribbons

82. M.Hohenadler, H. Fehske, **F. F. Assaad**
Phys. Rev. B **83**, 115105 (2011)
Dynamic charge correlations near the Peierls transition

83. David J. Luitz, **F. F. Assaad**, Manuel J. Schmidt
Phys. Rev. B **83**, 195432 (2011)
Exact diagonalization study of the tunable edge magnetism in graphene

84. M. Klein, A. Nuber, H. Schwab, N. Tobita, M. Higashiguchi, J. Jiang, S. Fukuda, K. Tanaka, K. Shimada, M. Mulazzi, **F. F. Assaad** and F. Reinert
Phys. Rev. Lett. **106**, 186407 (2011)
Coherent heavy quasiparticles in CePt5 surface alloy

85. F. Goth and **F. F. Assaad**
Phys. Rev. B **85**, 085129 (2012)
A time and spatially resolved quench of the fermionic Hubbard model showing restricted equilibration

86. M. Hohenadler and **F. F. Assaad**
Phys. Rev. B **85**, 081106(R) (2012)
Luttinger Liquid Physics and Spin-Flip Scattering on Helical Edges

87. M. Hohenadler, Z. Y. Meng, T. C. Lang, S. Wessel, A. Muramatsu and **F. F. Assaad**
Phys. Rev. B 85, 115132 (2012)
Editor's suggestion
Quantum phase transitions in the Kane-Mele-Hubbard model

88. M. Hohenadler, Stefan Wessel, Maria Daghofer and **Fakher F. Assaad**
Phys. Rev. B **85**, 195115 (2012)
Interaction-range effects for fermions in one dimension

89. D. J. Luitz, **F. F. Assaad**, T. Novotny, C. Karrasch and V. Meden
Phys. Rev. Lett. **108**, 227001 (2012) (http://arxiv.org/abs/1201.5117)
Understanding the Josephson current through a Kondo-correlated quantum dot

90. **F. F. Assaad**, M. Bercx, M. Hohenadler
Phys. Rev. Lett. submitted (http://arxiv.org/abs/1204.4728)
Quantum Spin Models from Flux Tubes in Correlated Topological Insulators

91. G. Sangiovanni, P. Wissgott, **F. Assaad**, A. Toschi, K. Held
Phys. Rev. B **86**, 035123 (2012) (http://arxiv.org/abs/1204.6570)
Enhancement of the effective disorder potential and the thermopower in Na_xCoO_2 through the electron-phonon coupling

92. Marcin Raczkowski, **Fakher F. Assaad**
Phys. Rev. Lett. 109, 126404 (2012)
Dimensional-crossover-driven Mott transition in the frustrated Hubbard model

93. Martin Hohenadler, **Fakher F. Assaad**, Holger Fehske
Phys. Rev. Lett. 109, 116407 (2012)
Effect of Electron-Phonon Interaction Range for a Half-Filled Band in One Dimension

94. M.Bercx and **F.F.Assaad**
Phys. Rev. B **86**, 075108 (2012)
Metamagnetism and Lifshitz Transitions in Models for Heavy Fermions

95. D. Rost, E. V. Gorelik, **F.F. Assaad**, N. Blümer
Phys. Rev. B 86, 155109 (2012)
Momentum-dependent pseudogaps in the half-filled two-dimensional Hubbard model

96. Martin Hohenadler, **Fakher F. Assaad**
JPCM accepted (http://arxiv.org/abs/1206.2864)
Peierls to superfluid crossover in the one-dimensional, quarter-filled Holstein model

97. Thomas C. Lang, Zi Yang Meng, Michael M. Scherer, Stefan Uebelacker, **Fakher F. Assaad**, Alejandro Muramatsu, Carsten Honerkamp and Stefan Wessel
Phys. Rev. Lett. 109, 126402 (2012)
Antiferromagnetism in the Hubbard Model on the Bernal-stacked Honeycomb Bilayer

98. Peng Zhang, Peter Reis, Ka-Ming Tam, Mark Jarrell, Juana Moreno, **Fakher F. Assaad** and Andy McMahan
Phys. Rev. Lett. Submitted (http://arxiv.org/abs/1209.0795)
Periodic Anderson model with electron-phonon correlated conduction band

Invitations to international conferences

1. Workshop on 'Magnetism and Superconductivity in Highly Correlated Electron Systems', Engelberg, (CH), March 3-6, (1993)
   Organizers: T. M. Rice, K. Ueda and M. Sigrist.
   Title of invited talk: 'Flux quantization in the two-dimensional repulsive and Attractive Hubbard models.'

2. Lake Hamana (Japan) 1994.
   Organizer: K. Ueda
   Title of presentation: 'High Frequency Hall Coefficient for the Two-dimensional Hubbard Model'

3. Conference on 'Anomalous Metallic State near the Mott transition', Naeba (Japan), October 30 to November 2 (1995).
   Organizer: M. Imada
   'Title of invited talk: Insulator-Metal Transition in the One and Two-Dimensional Hubbard Models'

4. Conference on 'Anomalous Metallic State in Strongly Correlated Systems', Lake Hamana (Japan), November 26-29 (1995).
   Organizer: S. Maekawa
   Title of invited talk: 'Insulator-Metal Transition in the One and Two-Dimensional Hubbard Models.'

5. '1997 Swiss Workshop on Superconductivity and Novel Metals', Les Diablerets September 29 October 1, (1997). (Abstract Selected for Oral Contribution.)
   Organizer: O. Fischer
   Title of presentation: Quantum Transition between an Antiferromagnetic Mott Insulator and $d_{x^2-y^2}$ Superconductor in Two Dimensions.

6. Physikertagung: Regensburg 20-27 March (1998) (Fachvortrag)
   Organizers: Deutschen Physikalischen Gesellschaft
   Title of invited talk: 'Charge and Spin Structures of a $d_{x^2-y^2}$ Superconductor in the Proximity of an Antiferromagnetic Mott Insulator.'

7. First result-workshop of the HLRS, Stuttgart June 22-24 (1998)
   Organizer: Dr. A. Geiger
   Title of invited talk: 'The interplay between d-wave superconductivity and antiferromagnetic fluctuations: a quantum Monte Carlo study.'

8. Conference on 'Magnetism and Superconductivity in Highly Correlated Electron Systems (GJM)'. MPIPKS-Dresden 6-10 July, 1998.
   Organizers: P. Wölfle, G. Guentherodt, Y. Kuramoto, T. Fujita
   Title of poster: Doping induced metal-insulator transition in Hubbard and extended Hubbard models.

9. International workshop on the 'Theory of Strongly Correlated Electrons', Hamamatsu, Japan. December 16-19 (1998).
   Organizers: K. Kuboki and M. Sigrist
   Title of presentation: '$d-$wave superconductivity and antiferromagnetic fluctuations.'

10. Physikertagung: Münster 22-26 March (1999) (Hautpvortrag).
    Organizers: Deutschen Physikalischen Gesellschaft
    Title of presentation: 'Hole dynamics in one and two-dimensional Mott insulators: a quantum Monte Carlo study'.

11. International workshop on 'Magnetic and orbital fluctuations in manganites', Schloss Ringberd, 6-10 April, 1999.
Organizers: L. Hedin, P. Horsch, A. M. Oleś and R. Zeyher
Title of poster: 'Quantum Monte Carlo simulations of the half-filled two-dimensional Kondo lattice model'.

12. Physics and Chemistry of Novel Materials: Strongly Correlated Electron Systems, Monte Verità (Ascona-CH) June 6-11 1999
Organizers: G. Blatter, M. Sigrist and V. Geshkenbein.
Title of poster: 'Antiferromagnetic order and spin-liquid behavior in the half-filled two dimensional Kondo-Lattice model.'

13. Computational Methods in Strongly Correlated Systems, Trieste June 28 - July 9 (1999)
Organizers: R. Scalettar, N. Trivedi, S. Sorella and Yu Lu
Title of presentation: 'Quantum Monte Carlo simulations of the two-dimensional Kondo lattice model.'

14. CECAM Workshop on 'Advances in numerical methods for correlated lattice systems'. Lyon July 27 - 31. (1999)
Organizers: A. Muramatsu, S. Sorella and S. White.
Title of presentation: 'QMC simulations of the two-dimensional Kondo-lattice model'

15. 'Interacting Electrons in Nanostructures' Physikzentrum Bad Honnef, 12-16 June 2000.
Organizers: R. Haug and H. Schoeller. Title of poster: 'Coexistence of Kondo screening and magnetism in the two-dimensional Kondo lattice model: a numerical study.'

16. 'Korrelationstage 2001' Dresden, 13-17 February 2001
Title of invited talk: 'Numerical studies of spin and charge dynamics in two-dimensional Kondo lattices.'
Organizers: W. Brenig, K. W. Becker and A. Honecker.

17. International conference on 'Magnetic Correlations, Metal-Insulator Transitions and Superconductivity in Novel Materials', Dresden, July 16-20, 2001.
Title of invited talk: 'Kondo lattices'
Organizers: W. Hanke and B. Keimer.

18. International Workshop 'Materials Simulation –Present and Future–', Shonan International Village (Japan) November 7-10, 2001.
Organizers: M. Imada (Chair), K. Terakura, H. Takayama, N. Hamada and S. Tsuneyuki.

19. Winter school on 'Quantum Simulations of Complex Many-Body Systems: From Theory to Algorithms',
John von Neumann Institute, for Computing, Forschungszentrum Jülich, February 2002.
Title of course: "Quantum Monte Carlo simulations on lattices and Determinantal methods on lattices".
Organizers: J. Grotendorst, D. Marx and A. Muramatsu.

20. 'VII Training Course in the Physics of Correlated Electron Systems and High-Tc Superconductors',
Vietri sul Mare (Salerno) Italy 14 - 25 October 2002
Title of course: 'Numerical approaches to correlated electron systems.'
Organizers: A. Avella, F. Mancini, M. Marinaro.

21. 'Correlated electron systems.',
Schloss Ringberg. 3 - 7 February 2003

Title of invited talk: ‘Numerical simulations of Kondo Lattice models.’
Organizers: W. Metzner.

22. Aspen Winter Conference on ‘Complex Quantum Order’.
9 - 15 February 2003
Title of invited talk: ‘Multi-flavored Hubbard models.’
Organizers: S. Kivelson and M. Troyer.

23. Korrelationstage.
24 - 28 February 2003
Title of invited talk: ‘Quantum Monte Carlo simulations: overview and perspectives.’
Organizers: P. van Dongen, B. Büchner and P. Horsch.

24. Physikertagung (Fachvortrag).
Dresden 24-28 March 2003
Title of talk: ‘Spin and charge dynamics of stripes in doped Mott insulators.’
Organizers: Deutschen Physikalischen Gesellschaft.

25. ’Competing phases in novel condensed matter systems’
Würzburg July 9-11, 2003
Title of invited talk: ’Numerical simulations of Kondo lattice models’
Organizers: Prof. Landwehr

26. ’The Sign Problem in Quantum Simulations’
CECAM, Lyon July 23-25, 2003. Title of invited talk: ‘Multiflavored Hubbard Models’.
Organizers: David Ceperley, Matthias Troyer, Uwe-Jens Wiese, Shailesh Chandrasekharan

27. ’Workshop on Exotic Order and Criticality in Quantum Matter’
KITP, University of California Santa-Barbara, March 2004 - April 2004.
Organizers: L. Balents, S. Das Sarma, S. Sachdev, S. Sondhi and M. Troyer.

28. ’8th Japanese-German Symposium on Competing Phases in Novel Condensed Matter Systems’
Waldhotel Zollernblick Lauterbad, Germany, August 1-5, 2004
Title of invited talk: Phase diagram of the SU(N) Hubbard-Heisenberg model.
Organizers: Prof. G. Güntherodt (RWTH Aachen), Prof. W. Hanke (University of Würzburg), Prof. Y. Kitaoka (Osaka University) and Prof. N. Kawakami (Osaka University)

29. Yukawa International Seminar 2004 (YKIS2004) Physics of Strongly Correlated Electron Systems"
Kyoto 9-20 November 2004
Title of invited talk: Gapless spin liquid phases in the SU(N) Hubbard Heisenberg model.
Organizers: H. Shiba, H. Tsunetsugu, A. Furusaki, M. Imada, N. Kawakami, T. Morinari, M. Sigrist, and K. Totsuka

30. Korrelationstage 2005.
28 February - 04 March, 2005
Title of invited talk: Phase diagram on the SU(N) Hubbard Heisenberg model.
Organizers: Florian Gebhard, Michael Lang and Gertrud Zwicknagl

31. International workshop on Effective Models for Low - Dimensional Strongly Correlated Systems.
Peyresque, France, September 12 - 16, 2005.

Title of invited talk: Symmetry projection schemes for Gaussian Monte Carlo methods.
Organizers: A. Auerbach, G. Batrouni, E. Dagotto, W. Hanke, A. Muramatsu, D. Poilblanc and S. C. Zhang

32. Workshop on Non-equilibrium Dynamics in Interacting Systems
Dresden April 18 - May 05, 2006.
Organiers: J. Kroha, A. Muramatsu and I. Perakis.
Title of invited talk: Gaussion Monte Carlo Methods: a way to solve the sign problem?

33. Summer school on Computational Many Particle Physics.
Grifswald Spetember 18-29, 2006
Organizers: H. Fehske, R. Schneider and A. Weisse.
Lectures on Auxiliary field QMC.

34. Korrelationstage 2007
Dresden, MPIPKS, 26. February - 02. March 2007
Organizers : Ralph Claessen, Peter Fulde, Maria-Roser Valenti.
Title of poster: Diagrammatic determinantal quantum Monte Carlo methods: Projective schemes and applications to the Hubbard-Holstein model.

35. Properties of HTSC II.
December 17-18, 2007 Münich Residence
Organizers: R. Hackl
Title of Poster: Spin- charge- and single-particle dyanmics of the Holstein model.

36. DPG Tagung Berlin 2008.
Invited speaker in the symposium: Surface Spectroscopy on Kondo Systems.
February 25-29, 2008
Title of presentation: The Kondo Lattice in two-dimensions: numerical studies of the Fermi surface.

37. The 1st International Conference of the Grand Challenge to Next-Generation Integrated Nanoscience
June 3-7, 2008, Tokyo, Japan
Organizers: Prof. S. Tsuneyuki, Prof. N. Kawashima and Prof. O. Sugino.
Title of invited talk: The Kondo Lattice in two-dimensions: quantum Monte Carlo studies of the Fermi surface.

38. Workshop on Frontiers in Strongly Correlated Systems
Aspen, 24. August - 7. September 2008.
Organizers: A. Georges, M. Jarrell, A. Millis, O. Parcollet and M. Troyer.

39. Properties of Cuprate Superconductors III, Joint Workshop of the MPI-FKF Stuttgart, Abteilungen Andersen, Keimer and Metzner, and the DFG Research Unit 538
Schloss Ringberg, Rottach-Egern, 3- 7 November, 2008
Title of invited talk: Numerical methods for correlated electron systems: CT-QMC and its application to the electron-phonon problem.

40. Numerical Approaches to Quantum Many-Body Systems
IPAM, UCLA, January 26-30, 2009
Organizers: Ulrich Schollwöck, Simon Trebst and Guifre Vidal
Title of invited talk: CT-QMC methods and their application to the electron-phonon problem.

41. The Physics of higher temperature superconductivity.
KITP, UCSB, August 3 - Spetember 11, 2009
Organizers: M. Beasley, E. Fradkin and D.J. Scalapino.

42. New Developments in Strongly Correlated Electron Systems
ETH Zürich, September 18 - September 21, 2009
Organizers: Manfred Sigrist, Hirokazu Tsunetsugu and Matthias Troyer
Title of invited talk: Coherence and Fermi surface topology in models of heavy fermions.

43. Recent developments in dynamical mean field theory
ETH Zürich, September 28 - September 30, 2009
Organizers: P. Werner, A. Lichtenstein and M. Sigrist
Title of invited talk: Bilayer Hubbard model for ^{3}He: a cluster dynamical mean field calculation.

44. Mardi Gras Conference on Computational Materials and Methods
Louisiana State University, Feb 11, 2010 - Feb 13, 2010.
Organizers: M. Jarrell for the LSU Center for Computation and Technology (CCT).
Title of invited talk: Novel Quantum Monte Carlo Methods for Correlated Electron Lattice Systems

45. International Symposium on Quantum Fluids and Solids (QFS2010)
Grenoble, France, August 2-6th 2010.
Title of invited talk: Bilayer Hubbard model for ^{3}He: a cluster dynamical mean-field calculation.

46. Japanese-Swiss Workshop
Tokyo 8 -10 September 2010
Organizers: Hiro Tsunetsugu, Kazuo Ueda and Manfred Sigrist.
Title of invited talk: Quantum spin liquid emerging in two-dimensional correlated Dirac fermions.

47. Analytische und numerische Methoden korrelierter Elektronen
Bad Honnef, 27 September - 1 October 2010
Title of invited talk: Continous time Monte methods for problems with retarded interactions and out of equilibrium
Organizers: Andreas Honecker, Andreas Klümper and Thomas Pruschke

48. Disentangling Quantum Many-body Systems: Computational and Conceptual Approaches.
KITP, UCSB, November 8 -December 3, 2010
Title of invited talk: SU(N) Hubbard-Heisenberg Models on the Honeycomb and Square lattices.
Organizers: Matthew P.A. Fisher, Claire Lhuillier, Simon Trebst and Guifre Vidal

49. Search for topological phases of matter
Princeton Center for Theoretical Science April 21-22,2011
Title of invited talk: Spin liquids and topological insulators on the honeycomb lattice.
Organizers: Dmitry Abanin, Andrei Bernevig, Zahid Hasan, and Shivaji Sondhi.

50. International Workshop on Strong Correlations and Angle-Resolved Photoemission Spectroscopy. (CORPES 11)
Berkeley, California July 18 - 22, 2011
Organizers: Zahid Hussain and Dan Dessau.

51. Workshop on Synergies between Field Theory and Exact Computational Methods in Strongly Correlated Quantum Matter
ICTP, Trieste, July 25-July 29 2011.
Organizers: Ribhu Kaul, Anders Sandvik, Matthias Vojta and Markus Mueller

52. Electronic structure of novel materials
Ringberg, Germany, September 11-14, 2011
Organizers: Ole K. Andersen and Olle Gunnarsson

53. Topological Insulators and Superconductors
KITP, UCSB, October 10, 2011 to October 28, 2011
Organizers: Charles Kane, Andreas Ludwig, Joel Moore, and Xiaoliang Qi

54. Workshop on Petascale Many Body Methods for Complex Correlated Systems
Göttingen January 6, 2012 to January 7, 2012
Organizers: Juana Moreno and Thomas Pruschke

55. School on Quantum Monte methods at work for novel phases of matter
ICTP Trieste January 23, 2012 to January 27, 2012
Organizers: Federico Becca(CNR and SISSA), Saverio Moroni (CNR and SISSA), Markus Mueller (ICTP), and Sandro Sorella (SISSA).

56. The Physics of Graphene
KITP, UCSB, January 30, 2012 to February 17, 2012
Organizers: Vladimir Falko, Francisco Guinea, Jeanie Lau, and Antonio H. Castro Neto.

57. Mott Physics Beyond Heisenberg
EPFL Lausanne on June 26-28, 2012
Organizers: Frederic Mila, Henrik Ronnow, Christian Rueegg

58. Frustrated Magnetism and Quantum Spin Liquids: From Theory and Models to Experiments
KITP, UCSB, August 13, 2012 to September 7, 2012.
Organizers: Kazushi Kanoda, Patrick Lee, Ashvin Vishwanath, and Steven White

59. Exotic Phases of Frustrated Magnets
KITP, UCSB, October 8, 2012 - October 12, 2012
Organisers: Kazushi Kanoda, Patrick Lee, Ashvin Vishwanath, and Steven White

60. Workshop on Advances in Electron Spectroscopy - Experiment and Theory
May 23 - May 26, 2013, Göttingen
Organizers: Kalobaran Maiti and Thomas Pruschke