



Curriculum vitae

Enrico Arrigoni

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Personal data:

Name, Title: Enrico Arrigoni, Univ. Prof. Dr.
Date and place of birth: January 28, 1966 in Treviso (Italy)
Nationality: Italian
Home address: Radegunderstraße 120 d
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Marital status: married, two children
Spoken languages: Italian (mother tongue), German (fluent), English (fluent),
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Academic degrees

Professor of Theoretical Physics		Nov. 2003 Graz University of Technology, Austria
“Habilitation” in Theoretical Physics	(German qualification for teaching at universities)	Jul. 2000 University of Würzburg
Doctor’s degree in Physics	70/70 “con Lode” (first-class honors)	Dec. 93 Scuola Normale Superiore - Pisa
“Diploma di licenza” in Physics		Mar. 89 - Scuola Normale Superiore, Pisa

“Laurea” (Degree) in Physics 110/110 “con Lode” (first-class honors) Mar. 89, University of Pisa, Italy

Academic and research activity

Professor of Theoretical Physics Graz University of Technology, Austria Since Nov. 2003

Visiting scientist at the University of Geneva (DPMC) - group of Prof. Th. Giamarchi January-February 03

Visiting scientist at the University of California Los Angeles (CA) - group of Prof. S. A. Kivelson Apr.-May 02

Visiting scientist at the university of Stanford (CA) - group of Prof. S. C. Zhang Feb.-Mar. 02

Heisenberg fellow of the German National Science Foundation (DFG) Oct. 01-Oct. 03

Research Assistant (“Wissenschaftlicher Assistent”) University of Würzburg, Germany Feb. 98-Oct. 2003

Visiting scientist at the university of Stanford(CA) - group of Prof. S. C. Zhang Jan.-Feb. 99
on leave since Oct. 01

European “Human and Capital Mobility” postdoc grant University of Würzburg Feb. 96 - Feb. 98

post-doc network grant from the European Community University of Würzburg Feb. 95 - Feb. 96

research fellowship Max-Planck Institut für Physik Komplexer Systeme, Stuttgart, Germany - group of Prof. P. Fulde Feb. 94 - Feb. 95

Pre-doctoral studies and activities

Civil service “Caritas” Pisa Dec. 92-Dec. 93

INFM grant for research on high-Tc superconductors Nov.-Dec. 92

grant by Europa Metalli-LMI for research on high-Tc superconductors May. 89-Apr. 92

Physics studies 84-89, University of Pisa

admission at Scuola Normale Superiore, ranking first ex-aequo at a national contest 84-88

Academic and administrative functions:

- Member of the “Studienkommission für die Studienrichtung Technische Physik”, TU Graz (2004-2015)
- Vice head of the Institute of Theoretical and Computational Physics, TU Graz (since 2007)
- *Fachreferent* for the field of Theoretical Physics in the FWF (Austrian Science Fund) Board (Since Oct. 2011).

Teaching

- Teaching classes:
 - Advanced Quantum Mechanics (since winter 2013)
 - Electromagnetic fields (each summer from 2006 to 2013)
 - Electrodynamics (each winter 2005-2015) Introduction to Theoretical Physics (a condensed Electrodynamics and Quantum Mechanics course for Mathematics students) (each summer since 2006)
 - Atomic Physics and Quantum Mechanics for Engineers (each winter since 2008)
 - Advanced numerical Methods
 - Computational Physics
 - Fermi Liquids and Non-Fermi Liquids
 - Open Quantum Systems out of Equilibrium
 - Many-body theory
 - Nonequilibrium Quantum Many-Body Theory
 - Introduction to Quantum Computers
 - Solid-state theory
 - Strongly-correlated condensed-matter systems
 - Correlation Phenomena in Condensed-matter Physics
 - Theoretical physics with Mathematica
 - Topics in correlated systems
 - Practical Course in correlated systems
 - Training classes in different Theoretical Physics courses (Electrodynamics, Quantum Mechanics, Thermodynamics and Statistical Physics, Classical Mechanics, Many-Body Methods for Strongly Correlated Systems, Solid-State Theory, as well as in Vector Analysis)

Invited talks held at international Conferences, and Workshops

1. Non-equilibrium Physics NePhy2018. Salerno, Italy, Sep 2018
Invited talk on “Correlated impurities, interfaces and photovoltaics out of equilibrium: Auxiliary Master Equation Approach”
2. Korrelationstage. Dresden, Germany, Sep 2017
Invited talk on “Correlated impurities and interfaces out of equilibrium: Auxiliary Master Equation Approach”
3. XXI Training Course in The Physics of Strongly Correlated Systems . Vietri sul Mare, Italy, Oct 2016
Lectures on “Master equations versus Keldysh Green’s functions for correlated quantum systems out of equilibrium”

4. 448. WE-Heraeus-Seminar, “Excitement in magnetism: Spin-dependent scattering and coupling of excitations in ferromagnets” . Schloss Ringberg, Germany, Nov. 2009
Invited talk on “Nonquasiparticle States in Half Metals”
5. 23. Workshop “Novel materials and superconductivity”. Planneralm Austria, Feb.-Mar. 2008
Plenary Lecture on: “Electron correlations in high-temperature superconductors”
6. Workshop “Properties of HTSC”. München, December 2007
“Three-band vs. single-band Hubbard model: phase diagram and single-particle spectrum”
7. International Conference on “Recent Progress in Many-Body Theories RPMBT14” . Barcelona, Spain, July 2007
“Electron Correlations in solids: From High-Temperature Superconductivity to Half-Metallic Ferromagnetism”
8. 22. Workshop “Novel materials and superconductivity”. Planneralm Austria, Feb. 2007
Plenary Lecture on: “Fascinating effects of electron correlation: From high-temperature superconductivity to Half-metallic ferromagnetism”
9. Key speaker at the 43rd International Winter School on Theoretical Physics ”Spin Physics, Spintronics, and Spin-Offs”. Schladming Austria, Feb. 2005
“Lectures on: Spin Pairing Mechanism in High-Temperature Superconductors”
10. Workshop “Ordering Phenomena in High-Temperature Superconductors”. München, November 2004
“Electron-Phonon and Electron-Magnon Interactions: Role of Vertex Corrections”
11. International Symposium on “Competing Phases in Novel Condensed Matter Systems”. Würzburg, July 2003
“Inhomogeneity and superconductivity”
12. International Conference on Frontiers in Condensed Matter Physics: Electronic Structure and Properties. Groningen, June 2002
“Pair phase fluctuations and the pseudogap”
13. Invited talk at the DPG-Tagung . Regensburg, March 2002
“Die Streifen-Phase in Hochtemperatursupraleitern”
14. “NIC Symposium” . Jülich, 5-6 December 2001
“Numerical simulations and the theory of high-temperature superconductors”
15. “HLCS-Euroconference: XI Workshop on Computational Materials Science (CMS2001)” . Villasimius, Sardinia, (Italy), 17-23 September 2001
“Strongly-Correlated Electrons between One and Higher Dimensions”
16. International Conference on “Magnetic Correlations, Metal-Insulator Transitions and Superconductivity in Novel Materials”. Dresden, 16-20 July 2001
“Where do holes go in doped antiferromagnets and what is their relationship to superconductivity?”

17. Minerva-ISF Workshop “Advances in High Temperature Superconductivity”. Ramat-Gan (Israel), 21-24 May 2001
“Why do stripes form in doped antiferromagnets and what is their relationship to superconductivity?”
18. International Workshop on “Correlation Effects and Electronic Structure Calculations”. ICTP Trieste (Italy), June 2000
“Normal and anomalous properties of metals between one and higher dimensions”
19. International workshop on “Non-Fermi Liquids”. Dresden Sep. 1999
“Crossover from Luttinger- to Fermi-Liquid behavior in quasi one-dimensional metals”
20. Conference: “Fisica Teorica e Struttura della Materia XVII”. Fai della Paganella (Italy), March 1998
“Dimensional coherence in coupled Luttinger Liquids: Crossover from one to two particles”
21. “Korrelationstage”. Dresden, Okt. 1997
“Ein- und Zweiteilchen Regime in Luttinger-Flüssigkeiten”
22. European network meeting “The electronic structure of strongly-correlated systems”. Groningen (Holland), Sept. 1996
“Properties of coupled fermionic chains”
23. Euroconference: “The role of dimensionality in Correlated Electronic Systems”. Torino (Italy), May 1996
“Low-energy excitations in fermionic ladders”
24. V SATT Conference “Superconduttori ad alta temperatura di transizione”. Capri (Italy), May 1992
“Antiferromagnetism and incommensurate magnetic structures in high T_c oxides”
25. Conference: “Fisica Teorica e Struttura della Materia VIII”. Fai della Paganella (Italy), April 1989
“Antiferromagnetism of CuO₂ layers by a slave-boson approach”

Grants for research funds

Description	period
“Dynamical Mean-Field Theory and Beyond” (extension) Co-application together with Prof. K. Held (TU Vienna) and Dr. M. Aichhorn	(2015-2018)
“Nonequilibrium correlated systems: auxiliary Master approach” (1 PhD + 1 Postdoc for three years).	(2014-2017)
“Variational Cluster Methods for Correlated Systems out of Equilibrium” (2 PhD for three years). Co-application together with Prof. W. von der Linden (TU Graz)	(2012-2015)

- “Dynamical Mean-Field Theory and Beyond” Project part of the *Spezialforschungsbereich* “Vienna Computational Materials Laboratory” (1 Postdoc and 1 PhD for four years). Co-application together with Prof. K. Held (TU Vienna) (2010-2014)
- FWF Research grant “Spin selective Quantum Transport through Heterointerfaces” (1 Postdoc and 1 PhD for three years). Co-application together with Prof. W. Pötz (KFU Graz) (2009-2012)
- DFG Forschergruppe “Doping Dependence of Phase Transitions and Ordering Phenomena in Cuprate Superconductors” (extension) (2 Postdocs for three years. Application together with Prof. W. Hanke, Prof. Assaad, and Dr. M. Potthoff) (2007-2010)
- FWF Research grant “Competing Phases in High-Temperature Superconductors: a theoretical investigation” (2 PhD students) (2007-2012)
- FWF Research grant “Correlation effects in Half-Metallic ferromagnets” (1 PhD students for tree years. Application together with Dr. L. Chioncel) (2006-2009)
- DFG Forschergruppe “Doping Dependence of Phase Transitions and Ordering Phenomena in Cuprate Superconductors” (2 PhD students for two years. Application together with Prof. W. Hanke, Prof. Assaad, and Dr. M. Potthoff) (2004-2006)
- Extension for one year of the above project (2006-2007)
- KONWIHR grant CUHE (second extension) for a Postdoc for one year (application together with Prof. W. Hanke and Prof. Assaad) (2003-2004)
- KONWIHR grant CUHE (extension) for a Postdoc for one year (application together with Prof. W. Hanke) (2002-03)
- KONWIHR grant CUHE for a Postdoc for one year (application together with Prof. W. Hanke) (2001-02)
- Heisenberg Fellowship from the DFG (the German National Science Foundation) (Oct. 01-Oct.03)
- DFG grant HA 1537/17-1 for a Postdoc for one year (application together with Prof. W. Hanke) (99-00)
- DFG grant HA 1537/20-1 for a Postdoc for one year (application together with Prof. W. Hanke) (00-01)

Techniques and knowledges:

- Many-body theory:

- Perturbative diagrammatic methods
- Slave-boson methods
- Functional-integral formalisms
- Perturbative and real-space renormalization-group techniques
- “Bosonization” for one dimensional systems and perturbation theory about the bosonized system
- Symmetrized self-consistent T -matrix approximation (FLEX) in the normal and in the superconducting state
- Density-matrix renormalization group (DMRG)
- Strong-Coupling and Cluster-perturbation theory with self-consistence (Variational cluster approach, cluster DMFT)
- Nonequilibrium Quantum Many-Body techniques
- Open Quantum Systems

- Computer:

- Fortran, Fortran 90, C++, Perl
- Tex, Latex, Bibtex
- Unix
- Mathematica

Full list of publications

h-index: 27 (ResearcherId), more than 2000 citations. **ResearcherID: E-4507-2012**

Publications in **refereed Journals** are numbered, preprints submitted for publication are marked by P: other publications are not numbered and marked by **

- [**] A Mean-Field Description of the Antiferromagnetism of CuO_2 Layers
E. Arrigoni, G. C. Strinati and C. Castellani
Helv. Phys. Acta **62**, 686–690 (1989).
- [1] Itinerant vs. Localized Antiferromagnetism of CuO_2 Layers
E. Arrigoni, G. C. Strinati and C. Castellani
Physica C **162–164**, 785–786 (1989).
- [2] Antiferromagnetism of CuO_2 Layers within a Slave – Boson Approach
E. Arrigoni, G. C. Strinati and C. Castellani
Phys. Rev. B **41**, 4838–4841 (1990), (Rapid Communications).
- [3] Doping-induced Incommensurate Antiferromagnetism in a Mott – Hubbard insulator
E. Arrigoni and G. C. Strinati
Phys. Rev. B **44**, 7455–7465 (1991).
- [4] Incommensurate Antiferromagnetism Within a Slave – Boson Approach to a Two-Dimensional Hubbard Hamiltonian
E. Arrigoni, G. C. Strinati and M. Geddo
Physica C **185–189**, 1691–1692 (1991).
- [5] Spin-Wave Spectrum of a Two-Dimensional Itinerant-Electron Antiferromagnet Based on a CuO_2 Layer: Approximate Mapping onto an Effective Heisenberg Model
E. Arrigoni and G. C. Strinati
Phys. Rev. B **45**, 7816–7827 (1992).
- [6] Anomalous Pressure Dependence of the La_2CuO_4 Superexchange Interaction: an Evidence of Band Antiferromagnetism?
E. Arrigoni and G. C. Strinati
Solid State Communications **87**, 237–240 (1993).
- [7] Beyond the Gutzwiller Approximation in the Slave-Boson Approach: Inclusion of Fluctuations with the Correct Continuum Limit of the Functional Integral
E. Arrigoni and G. C. Strinati
Phys. Rev. Lett. **71**, 3178–3181 (1993).
- [8] Functional-Integral Formulation of the Slave-Boson Approach: Beyond the Mean-Field Treatment with the Correct Continuum Limit
E. Arrigoni, C. Castellani, M. Grilli, R. Raimondi and G. C. Strinati
Phys. Rep. **241**, 291–371 (1994).
- [9] Correct Formulation of the $1/N$ Expansion for the Slave-Boson Approach within the Functional Integral
E. Arrigoni, C. Castellani, R. Raimondi and G. C. Strinati
Phys. Rev. B **50**, 2700–2703 (1994).

- [**] Implementing the Four–Slave–Boson Approach with the Correct Continuum Limit of the Functional Integral
E. Arrigoni and G. C. Strinati
Physica C **235–240**, 2255–2256 (1994).
- [10] Consistent $\frac{1}{N}$ –Expansion for the Four–Slave–Boson Approach with an Appropriate Operator–Ordering Prescription
E. Arrigoni and G. C. Strinati
J. Low Temp. Phys. **99**, 599–601 (1995).
- [11] Correct Continuum Limit of the Functional–Integral Representation for the Four–Slave–Boson Approach to the Hubbard Model: Paramagnetic Phase
E. Arrigoni and G. C. Strinati
Phys. Rev. B **52**, 2428–2462 (1995).
- [12] Exact Criterion for Choosing the Hopping Operator in the Four–Slave–Boson Approach
E. Arrigoni and G. C. Strinati
Phys. Rev. B **52**, 13707–13710 (1995).
- [**] Revising the $1/N$ Expansion for the Slave–Boson Approach within the Functional Integral
E. Arrigoni, C. Castellani, R. Raimondi and G. C. Strinati
in *The Hubbard Model - Its Physics and Mathematical Physics*, Vol. 343 of *NATO ASI Series*, edited by D. Baeriswyl, D. K. Campbell, J. M. P. Carmelo, F. Guinea and E. Louis (Plenum Press, New York, 1995), pp. 209–216.
- [13] Spin and Charge Excitations in a Three–Legs Fermionic Ladder: a Renormalization–Group Study
E. Arrigoni
Phys. Lett. A **215**, 91–96 (1996).
- [14] Phase Diagram of Three Fermionic Chains: a Renormalization–Group Study
E. Arrigoni
Phys. Stat. Solidi B **195**, 425–432 (1996).
- [15] Electron transport in dirty multi–channel systems
E. Arrigoni, B. Brendel and W. Hanke
Zeitschrift für Physik B **103**, 177–180 (1997).
- [16] Electron Transport in Coupled Chains of Interacting Fermions with Impurities
E. Arrigoni, B. Brendel and W. Hanke
Phys. Rev. Lett. **79**, 2297 (1997).
- [17] Interchain coherence of coupled Luttinger liquids at all orders in perturbation theory
E. Arrigoni
Phys. Rev. Lett. **80**, 790–793 (1998).
- [18] Universal scaling behavior of coupled chains of interacting fermions
S. Capponi, D. Poilblanc and **E. Arrigoni**
Phys. Rev. B **57**, 6360–6369 (1998).

- [19] Systematic numerical study of spin–charge separation in one dimension
M. G. Zacher, **E. Arrigoni**, W. Hanke and J. R. Schrieffer
Phys. Rev. B **57**, 6370–6375 (1998).
- [20] SO(5) Theorie der Hoch- T_c Supraleitung: ein neues Symmetriekonzept in der Festkörperphysik
W. Hanke, R. Eder and **E. Arrigoni**
Phys. Blätter **54**, 436–439 (1998).
- [21] Numerical study of spin–charge separation in one dimension
M. G. Zacher, **E. Arrigoni**, W. Hanke and J. R. Schrieffer
in *High Performance Computing in Science and Engineering '98*, edited by E. Krause and W. Jäger (Springer Verlag, Heidelberg, 1998), pp. 121–132.
- [22] Renormalized SO(5) symmetry in ladders with next–nearest–neighbor hopping
E. Arrigoni and W. Hanke
Phys. Rev. Lett. **82**, 2115 (1999).
- [23] Magnetic Properties of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ in a self–consistent approach: Comparison with Quantum–Monte–Carlo Simulations and Experiments
G. Hildebrand, **E. Arrigoni**, C. Gröber and W. Hanke
Phys. Rev. B **59**, 6534–6544 (1999).
- [24] Interplane magnetic coupling effects in the multilattice compound $\text{Y}_2\text{Ba}_4\text{Cu}_7\text{O}_{15}$
G. Hildebrand, **E. Arrigoni**, J. Schmalian and W. Hanke
Phys. Rev. B **59**, R685 (1999).
- [25] SO(5) Symmetry in t–J and Hubbard Models
W. Hanke, R. Eder, **E. Arrigoni**, A. Dorneich, S. Meixner and M. G. Zacher
in *Festkörper Probleme/Advances in Solid State Physics*, edited by B. Kramer (Vieweg, Braunschweig, 1999), Vol. 38.
- [**] SO(5) theory of high- T_c superconductivity: models and experiments
W. Hanke, R. Eder, **E. Arrigoni**, A. Dorneich and M. G. Zacher
Physica C **317**, 175–184 (1999).
- [26] Magnetic fluctuations in coupled inequivalent Hubbard layers as a model for $\text{Y}_2\text{Ba}_4\text{Cu}_7\text{O}_{15}$
G. Hildebrand, **E. Arrigoni**, J. Schmalian and W. Hanke
Eur. Phys. J. B **8**, 195–205 (1999).
- [27] Crossover from Luttinger– to Fermi–liquid behavior in strongly anisotropic systems in large dimensions
E. Arrigoni
Phys. Rev. Lett. **83**, 128–131 (1999).
- [28] Projected SO(5) Models
S.-C. Zhang, J.-P. Hu, **E. Arrigoni**, W. Hanke and A. Auerbach
Phys. Rev. B **60**, 13070–13084 (1999).

- [**] Projected SO(5)-theory and the interrelation of superconducting and antiferromagnetic gaps in High- T_c compounds
W. Hanke, M. G. Zacher, **E. Arrigoni** and S.-C. Zhang
Physica B **280**, 184–188 (2000).
- [29] Crossover to Fermi-liquid behavior for weakly-coupled Luttinger liquids in the anisotropic large-dimension limit
E. Arrigoni
Phys. Rev. B **61**, 7909–7929 (2000).
- [30] Interrelation of Superconducting and Antiferromagnetic Gaps in High- T_c Compounds: a Test Case for the SO(5) Theory
M. G. Zacher, W. Hanke, **E. Arrigoni** and S.-C. Zhang
Phys. Rev. Lett. **85**, 824–827 (2000).
- [31] $t - U - W$ Model of a $d_{x^2-y^2}$ Superconductor in the Proximity of an AF Mott Insulator: Diagrammatic Studies vs. QMC Simulations
T. Eckl, **E. Arrigoni**, W. Hanke and F. F. Assaad
Phys. Rev. B **62**, 12395-12407 (2000).
- [32] Critical properties of projected SO(5) models at finite temperatures
E. Arrigoni and W. Hanke
Phys. Rev. B **62**, 11770-11777 (2000).
- [33] Stripes in doped antiferromagnets: single-particle spectral weight
M. G. Zacher, R. Eder, **E. Arrigoni** and W. Hanke
Phys. Rev. Lett. **85**, 2585-2588 (2000).
- [34] Stripes and superconducting pairing in the $t - J$ model with Coulomb interactions
E. Arrigoni, A. P. Harju, W. Hanke, B. Brendel and S. A. Kivelson
Phys. Rev. B **65**, 134503 (2002).
- [35] Stripes in doped antiferromagnets: bond-centered vs. site-centered
M. G. Zacher, R. Eder, **E. Arrigoni** and W. Hanke
Int. J. Mod. Phys. **14**, 3783-3790 (2000).
- [36] Spectral Properties of CuO_2 Planes in a Cluster Perturbation Approach
C. Dahnken, R. Eder, **E. Arrigoni** and W. Hanke
in *High Performance Computing in Science and Engineering '00*, edited by E. Krause and W. Jäger (Springer Verlag, Heidelberg, 2000), pp. 119–127.
- [37] Spin-wave spectrum of a two-dimensional itinerant electron system: Analytic results for the incommensurate spiral phase in the strong-coupling limit
E. Arrigoni and G. C. Strinati
Eur. Phys. J. B **19**, 433-448 (2001).
- [38] Interplay of Phase Fluctuations and Electronic Excitations in High-Temperature Superconductors - A Monte Carlo Simulation
T. Eckl, **E. Arrigoni**, W. Hanke and D. J. Scalapino
in *High Performance Computing in Science and Engineering '01*, edited by E. Krause and W. Jäger (Springer Verlag, Berlin, 2001), pp. 210–218.

- [39] Evolution of the stripe phase as a function of doping from a theoretical analysis of angle-resolved photoemission data
M. G. Zacher, R. Eder, **E. Arrigoni** and W. Hanke
Phys. Rev. B **65**, 045109 (2002).
- [40] Where do holes go in doped antiferromagnets and what is their relationship to superconductivity?
E. Arrigoni, M. G. Zacher, R. Eder, W. Hanke, A. P. Harju and S. A. Kivelson
J. Phys. Chem. Solids **63**, 2207–2212 (2002).
- [41] Spectral properties of high- T_c cuprates via a Cluster-Perturbation Approach
C. Dahnken, **E. Arrigoni** and W. Hanke
J. Low Temp. Phys. **126**, 949–959 (2002).
- [**] Dynamical Properties and the Phase Diagram of the projected SO(5)-symmetric model of high- T_c Superconductors
A. Dorneich, W. Hanke, **E. Arrigoni**, M. Troyer and S. Zhang
J. Phys. Chem. Solids **63**, 1365–1370 (2002).
- [42] Pair phase fluctuations and the pseudogap
T. Eckl, D. J. Scalapino, **E. Arrigoni** and W. Hanke
Phys. Rev. B **66**, 140510(R) (2002).
- [**] A bosonic model for high-temperature superconductivity and antiferromagnetism: numerical simulation studies
A. Dorneich, **E. Arrigoni**, W. Hanke, M. Troyer and S. C. Zhang
in *NIC Symposium 2001*, edited by H. Rollnik and D. Wolf (NIC-Directors, Jülich, 2002).
- [43] Phase diagram and dynamics of the projected SO(5)- symmetric model of high- T_c superconductivity
A. Dorneich, W. Hanke, **E. Arrigoni**, M. Troyer and S. C. Zhang
Phys. Rev. Lett. **88**, 057003 (2002).
- [44] Self-organized quasi-one dimensional structures in high-temperature superconductors: the stripe phase
E. Arrigoni, M. G. Zacher, R. Eder, W. Hanke and S. A. Kivelson
in *Advances in Solid State Physics*, edited by B. Kramer (Springer, Berlin, 2002), Vol. 42, pp. 307–318.
- [45] Antiferromagnetism and hole pair checkerboard in the vortex state of high T_c superconductors
H.-D. Chen, J.-P. Hu, S. Capponi, **E. Arrigoni** and S.-C. Zhang
Phys. Rev. Lett. **89**, 137004 (2002).
- [46] Phase fluctuations and the Role of Electron-Phonon Coupling in High- T_c Superconductors
T. Eckl, Z.-B. Huang, W. Hanke and **E. Arrigoni**
in *High Performance Computing in Science and Engineering, 2002*, edited by E. Krause and W. Jäger (Springer Verlag, Berlin, 2001), p. 269.

- [47] Phase – fluctuation induced reduction of kinetic energy at the superconducting transition
T. Eckl, W. Hanke and **E. Arrigoni**
Phys. Rev. B **68**, 014505 (2003).
- [48] Scaling properties of the projected SO(5) model in three dimensions
M. Jöstingmeier, A. Dorneich, **E. Arrigoni**, W. Hanke and S.-C. Zhang
Phys. Rev. B **68**, 245111 (2003).
- [**] Cluster-perturbation-algorithm applied to inhomogenous strongly-correlated materials
C. Dahnken, **E. Arrigoni**, W. Hanke, M. G. Zacher and R. Eder
in *Proceedings of the First Joint HLRB and KONWIHR Result and Reviewing Workshop, Garching, Oct. 2002*, edited by S. Wagner, W. Hanke, A. Bode and F.Durst (Springer, Berlin, Heidelberg, New York, 2003).
- [**] Object-oriented C++ class library for many body physics on finite lattices and a first application to high-temperature superconductivity
A. Dorneich, M. Jöstingmeier, **E. Arrigoni**, C. Dahnken, T. Eckl, W. Hanke, S. C. Zhang and M. Troyer
in *Proceedings of the First Joint HLRB and KONWIHR Result and Reviewing Workshop, Garching, Oct. 2002*, edited by S. Wagner, W. Hanke, A. Bode and F.Durst (Springer, Berlin, Heidelberg, New York, 2003).
- [49] Frozen phonon calculations in the three-band Hubbard model for high-temperature superconductors
Z.-B. Huang, W. Hanke and **E. Arrigoni**
in *High Performance Computing in Science and Engineering '02*, edited by E. Krause and W. Jäger (Springer Verlag, Berlin, 2004), p. 149.
- [50] Optimal inhomogeneity for superconductivity
E. Arrigoni and S. A. Kivelson
Phys. Rev. B **68**, 180503(R) (2003).
- [51] Antiferromagnetic and superconducting gaps and their interrelation in high-T_c cuprates
E. Arrigoni, M. G. Zacher, T. Eckl and W. Hanke
Ann. Phys. (Leipzig) **12**, 320–338 (2003).
- [52] Electron – phonon Vertex in the Two – dimensional One – band Hubbard Model
Z. B. Huang, W. Hanke, **E. Arrigoni** and D. J. Scalapino
Phys. Rev. B **68**, 220507(R) (2003).
- [P:53] Asymmetric electron-phonon interactions in the three-band Peierls-Hubbard model
Z. B. Huang, W. Hanke and **E. Arrigoni**
(cond-mat/0309380) (2003).
- [54] Variational cluster approach to spontaneous symmetry breaking: The itinerant antiferromagnet in two dimensions
C. Dahnken, M. Aichhorn, W. Hanke, **E. Arrigoni** and M. Potthoff
Phys. Rev. B **70**, 245110 (2004).

- [55] Electron-doping evolution of the quasiparticle band of the cuprates
C. Dahnken, M. Potthoff, **E. Arrigoni** and W. Hanke
in *High Performance Computing in Science and Engineering, 2004*, edited by E. Krause, W. Jäger and M. Resch (Springer Verlag, Berlin, 2004), p. 141.
- [56] Mechanism of High Temperature Superconductivity in a striped Hubbard Model
E. Arrigoni, E. Fradkin and S. A. Kivelson
Phys. Rev. B **69**, 214519 (2004).
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