1. Record Nr. UNINA9910784750603321 Order, disorder and criticality [[electronic resource]]. Volume 2: Titolo advanced problems of phase transition theory / / editor, Yurij Holovatch Hackensack, NJ;; London,: World Scientific, 2007 Pubbl/distr/stampa **ISBN** 1-281-91859-8 9786611918590 981-270-876-6 Descrizione fisica 1 online resource (308 p.) Advanced Problems of Phase Transition Theory;; v.2 Collana Altri autori (Persone) HolovatchYurij Disciplina 530.4/74 Soggetti Phase transformations (Statistical physics) Statistical physics Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Includes bibliographical references and index. Nota di bibliografia Nota di contenuto CONTENTS: Preface: Introduction to the Non-Perturbative Renormalization Group Bertrand Delamotte; Contents; 1. Wilson's Renormalization Group; 1.1. Introduction; 1.2. The Perturbative Method in Field Theory: 1.3. Wilson's Approach to the Renormalization Group: 2. Renormalization Group Transformations; 2.1. Blocks of Spins; 2.2. Two Remarks Concerning RG Transformations; 2.3. Linear RG Transformations and Correlation Length; 3. Properties of the RG Flow: Fixed Points, Critical Surface, Relevant Directions; 3.1. Scaling Relations - Linearization of the Flow Around the Fixed Point 3.2. The Correlation Length and the Spin-Spin Correlation Function 3.3. Scaling of the Correlation Function in the Presence of a Magnetic Field -Relation Among Exponents; 3.4. The Example of the Two-Dimensional Ising Model on the Triangular Lattice; 4. The Non-Perturbative Renormalization Group; 4.1. Introduction; 4.1.1. The Wilson-Polchinski Approach; 4.2. The Effective Average Action Method; 4.2.1. Block-Spins, Coarse Graining, Legendre Transform, etc.; 4.3. An Integral Representation of k and the Limit k; 5. The Exact RG Equation and Its **Properties** 9.2. The RG Equation for the Dimensionless Potential U k9.3. The Limits d 4, d 2 and N; 10. Conclusion; Acknowledgements; Appendix

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## Sommario/riassunto

This book is the second volume of review papers on advanced problems of phase transitions and critical phenomena, following the success of the first volume in 2004. Broadly, the volume aims to demonstrate that the phase transition theory, which experienced its 'golden age' during the 70's and 80's, is far from over and there is still a good deal of work to be done, both at the fundamental level and in respect of applications. The topics presented in this volume include: critical behavior as explained by the non-perturbative renormalization group, critical dynamics, a spacetime approach to phase t