

1. Record Nr.	UNINA9910452344203321
Titolo	Proceedings of the 25th Solvay Conference on Physics [[electronic resource]] : the theory of the quantum world : Brussels, Belgium, 19-22 October 2011 // editors, David Gross, Marc Henneaux, Alexander Sevrin
Pubbl/distr/stampa	[Hackensack] N.J., : World Scientific, c2013
ISBN	1-299-46275-8 981-4440-62-0
Descrizione fisica	1 online resource (387 p.)
Altri autori (Persone)	GrossDavid HenneauxMarc SevrinAlexander
Disciplina	530.1/2 539
Soggetti	Quantum theory Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	The International Solvay Institutes; In Memoriam Jacques Solvay (1920-2010); 25th Solvay Conference on Physics; Opening Session; Contents; Session 1: History and Reflections Chair: M. Henneaux; John L. Heilbron: The First Solvay Council "A sort of private conference"; 1. Introduction; 2. Soda and Energy; 3. Positivism and Progress; 4. International Connections; 5. The Council of 1911; Works Cited; References; Murray Gell-Mann: From Solvay 1961 to Solvay 2011; Session 2: Foundations of Quantum Mechanics and Quantum Computation Chair: A. Aspect Rapporteur talk by A. Leggett: The Structure of a World Described by Quantum MechanicsReferences; Prepared comments; Discussion; Prepared comments; Discussion; Rapporteur talk by J. Preskill: Quantum Entanglement and Quantum Computing; 1. Introduction: Toward Quantum Supremacy; 2. Quantum Entanglement and the Vastness of Hilbert Space; 3. Separating Classical from Quantum; 4. Easiness and Hardness; 5. Local Hamiltonians; 6. Quantum Error

Correction; 7. Scalable Quantum Computing; 8. Topological Quantum Computing; 9. Quantum Computing vs. Quantum Simulation; 10.

Conclusions and Questions

AcknowledgmentsReferences; Prepared comment; Discussion; Session 3: Control of Quantum Systems Chair: P. Zoller; Rapporteur talk by I.

Cirac: Quantum Computing and Simulation with Atoms and Photons; 1.

Introduction; 2. Bottom-up Approach: Quantum Information; 3. Top-

down Approach: Quantum Simulations; 4. Conclusions; References;

Prepared comments; Discussion; Rapporteur talk by S. Girvin: Quantum Machines: Coherent Control of Mesoscopic Solid-State Systems; 1.

Introduction; 2. Superconducting Qubits and Quantum Microwave

Circuits; 2.1. Quantum Limited Amplification, Measurement and Feedback

2.2. Future Directions for Superconducting Qubits3. Quantum

Optomechanics; 4. Summary; Acknowledgments; References; Prepared

comment; Discussion; Prepared comments; Discussion; Prepared

comments; Discussion; Session 4: Quantum Condensed Matter Chair: B.

Halperin; Rapporteur talk by S. Sachdev: The Quantum Phases of

Matter; 1. Introduction; 2. Gapped Quantum Matter; 3. Conformal

Quantum Matter; 4. Compressible Quantum Matter; 5. Connections to

String Theory; Acknowledgments; References; Discussion; Prepared

comments; Discussion; Prepared comments; Discussion; Prepared

comments; Discussion

Session 5: Particles and Fields Chair: H. GeorgiRapporteur talk by F.

Wilczek: A Long View of Particle Physics; 1. Origins: Understanding

Matter; 2. Phenomena: New Questions and Surprising Answers; 3.

Questions That the Standard Model Begs; 3.1. Questions from the Core;

3.2. Loose Ends; 3.3. Gravity; 4. Approaches: "Modest" Improvements;

4.1. Unification and Supersymmetry; 4.2. Problem and Axions; 5.

Experimental Frontiers; 6. Cosmic Questions: Way Beyond the Standard

Model; 6.1. Kinematics and Dynamics; 6.2. Dynamics and Initial Values;

6.3. The Ubiquity of Spinors

6.4. Information as Foundation?

Sommario/riassunto

Ever since 1911, the Solvay Conferences have shaped modern physics. The 25th edition held in October 2011 in Brussels and chaired by David Gross continued this tradition and celebrated the first centennial of this illustrious series of conferences. The development and applications of quantum mechanics have always been the main threads in the history of the Solvay Conferences, hence the 25th Solvay conference gathered many of the leading figures working on a wide variety of profound problems in physics where quantum mechanical effects play a central role. The conference addressed some of the mo
