Record Nr. UNINA9910814882903321 Quantum aspects of life [[electronic resource] /] / editors, Derek **Titolo** Abbott, Paul C.W. Davies, Arun K. Pati ; foreword by Roger Penrose Pubbl/distr/stampa London, : Imperial College Press Hackensack, NJ;; London,: Distributed by World Scientific, c2008 **ISBN** 1-84816-255-3 Descrizione fisica 1 online resource (468 p.) Altri autori (Persone) AbbottDerek <1960-> DaviesP. C. W PatiArun K Disciplina 576.8/3 Soggetti Quantum biochemistry Life - Origin 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 and index. Nota di contenuto Preface: Foreword: Acknowledgments: Contents: Part 1: Emergence and Complexity; 1. A Quantum Origin of Life? Paul C. W. Davies; 1.1. Chemistry and Information; 1.2. Q-life; 1.3. The Problemof Decoherence; 1.4. Life as the "Solution" of a Quantum Search Algorithm; 1.5. Quantum Choreography; Acknowledgements; References; 2. Quantum Mechanics and Emergence Seth Lloyd; 2.1. Bits; 2.2. Coin Flips; 2.3. The Computational Universe; 2.4. Generating Complexity; 2.5. A Human Perspective; 2.6. A QuantumPerspective; References; Part 2: Quantum Mechanisms in Biology 3. Quantum Coherence and the Search for the First Replicator Jim Al-Khalili and Johnjoe McFadden3.1. When did Life Start?; 3.2. Where did Life Start?: 3.3. Where did the Precursors Come From?: 3.4. What was the Nature of the First Self-replicator?; 3.5. The RNAWorld Hypothesis; 3.6. A Quantum Mechanical Origin of Life; 3.6.1. The dynamic combinatorial library; 3.6.2. The two-potential model; 3.6.3. Decoherence; 3.6.4. Replication as measurement; 3.6.5. Avoiding decoherence; 3.7. Summary; References 4. Ultrafast Quantum Dynamics in Photosynthesis Alexandra Olaya

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## Sommario/riassunto

This book presents the hotly debated question of whether quantum mechanics plays a non-trivial role in biology. In a timely way, it sets out a distinct quantum biology agenda. The burgeoning fields of nanotechnology, biotechnology, quantum technology, and quantum information processing are now strongly converging. The acronym BINS, for Bio-Info-Nano-Systems, has been coined to describe the synergetic interface of these several disciplines. The living cell is an information replicating and processing system that is replete with naturally-evolved nanomachines, which at some level require a quant