Wild and not so Wild Dreams in Physics

Henrik Georg Bohr and Holger Bech Nielsen,
DTU and Niels Bohr Institute, Copenhagen, Denmark
coedited by mag.art. Bent Raymond Jørgensen, SDU.

28 chapters in total each of around 5 pages comprising:

4 Introductory chapters about the concepts & appendix with formula.

24 Chapters of wild new theories and models &12 appendices with formula.

The main text is supposed to be an approach to the wild theories in physics for lay-men with many pedagogical figures but with most of the mathematical equations and novel ideas relegated to appendices, each corresponding to a particular chapter. In that way we make the main text available for a very broad audience but at the same time present our original ideas to a specialized scientific audience that can enjoy the appendices.

Content:

5.2 Worm holes.

5.3 Radiation from black holes and white holes.

a. Gamma-bursts from black hole creation.

5.4 Travelling into a black hole.

5.5 Black hole theater.

5.6 Black holes as stepping stones for space travel.

5.7 The large scale of the universe with voids.

a. Cavitation as a process for formation of the voids.

b. Dark matter and dark energy.

6. The concepts of entropy, randomness and order.

6.1 Entropy and the Gibbs ensemble.

6.2 The big crunch and entropy decrease.

7. The concepts of geometry and topology in the general relativity theory.

7.1 The topology of relativistic wormholes.

7.2 Stepping back in time with wormholes.

8. Epistemological problems in Quantum Mechanics.

8.1 The double slit experiment.

8.2 Einstein-Podolsky-Rosen Experiment.

8.3 Could symmetry be the existing.

8.4 The many-world interpretation of quantum mechanics.

8.5 Quantum mechanics from space-time symmetries.

8.6 New fancy usage of quantum theory:

a. Bose-Einstein condensation.

b. Slowing light in ultra-cold atoms.

c. Quantum teleportation etc.

d. Quantum computers.

9. Biological brains and neural networks.

9.1 The anatomy of the physiological neural networks.

9.2 Neural networks add experience to genetic heritage.

9.3 The basics of neural networks.

9.4 Modeling the biological brain with random networks.

10. The molecules of life.

10.1 The genome project.

10.2 The protein, its structure and function.

10.3 The central DNA/RNA molecules.

10.4 The cellular membranes and its phases.

SECTION II: Wild new ambitious theories in physics.

11. The Ising models in solid state physics and applied to social systems.

11.1 The Ising model for ferromagnetic and paramagnetic systems.

11.2 A model for an alloy of copper and zinc, the beta-brass system.

11.3 An American presidential election modeled by the Ising techniques.

12. Baryonic quark strings in the atomic nucleus.

12.1 A quark model for nuclear structure.

12.2 The baryonic string force in the nuclear bag.

13. Protein folding models and life processes.

13.1 The protein folding problem.

13.2 Various physics models of protein folding.

a. Lattice models of protein folding.

b. Spin-glass theories of the folding process.

c. Neural network memory models for proteins.

d. Random polymer or plastic models of protein folding.

e. Knot theory for protein structures.

f. The funnel picture of the protein energy landscape.

g. Simplified molecular dynamics for protein folding.

h. Differential geometric model for protein folding kinetics.

14. Topological wring modes in chain molecules.

14.1 Protein folding and wring resonances.

14.2 Molecular resonators.

14.3 Hydrolysis of proteins and DNA damages.

14.4 Wring modes and the prion diseases.

15. Bio-network and bio-dynamics with strange particles.

15.1 Reaction kinetics via contact dynamics of proteins.

16. Topological thermodynamics of bio-membranes.

16.1 Phenomenology of bio-membranes.

16.2 A model for topological thermodynamics of closed membranes.

17. Particles from a boiling quark soup and jets from sausage splitting.

17.1 A thermodynamical quark model for hadron production.

17.2 Production of jets by sausage splitting through tunneling.

18. The spaghetti vacuum of QCD and monopole condensation.

18.1 Copenhagen spaghetti.

18.2 Lattice QCD.

18.3 Monopole condensation in the QCD vacuum and super-conductivity.

19. The Standard model and the Higgs.

19.1 The Standard model of weak, electromagnetic and strong forces.

a. Spontaneous symmetry breaking and the Nambu-Goldstone boson.

19.2 The Higgs mechanism and the tHooft regularization.

20. Hunting the Higgs particle and possible Higgs scenarios.

SECTION III Truly wild dreams.