Shyam Wuppuluri · Giancarlo Ghirardi
Editors

Space, Time and the Limits of Human Understanding

Springer
Contents

Part I  Philosophy

1. Space as a Source and as an Object of Knowledge: The Transformation of the Concept of Space in the Post-Kantian Philosophy of Geometry .......... 3
   Francesca Biagioli

2. Time in Physics and Time in Awareness .................. 15
   E.C.G. Sudarshan

3. Time and Space in Ancient India: Pre-philosophical Period ...... 23
   Nataliya Yanchevskaya and Michael Witzel

4. Śrīharṣa on the Indefinability of Time .......................... 43
   Jonathan Duquette and Krishnamurti Ramasubramanian

5. From Time to Time ........................................ 61
   Nathan Salmon

6. Why Spacetime Has a Life of Its Own .................. 77
   James Robert Brown

7. The Phenomenology of Space and Time: Husserl, Sartre, Derrida ........................................ 87
   Hans Herlof Grelland

8. Space, Time, and (How They) Matter .......................... 95
   Valia Allori

   Nicholas Maxwell
Part II  Physics

10. Nature’s Book Keeping System ........................................... 127
   Gerard ’t Hooft

11. Spacetime and Reality: Facing the Ultimate Judge .................. 137
   Vesselin Petkov

12. The Future’s Not Ours to See ........................................... 149
   Anthony Sudbery

13. Hermann Weyl’s Space-Time Geometry and Its Impact on Theories of Fundamental Interactions ..................................... 159
   Norbert Straumann

14. Matter, Space, Time, and Motion: A Unified Gravitational Perspective ................................................................. 167
   C.S. Unnikrishnan

15. An Anomaly in Space and Time and the Origin of Dynamics ...... 185
   Joan A. Vaccaro

16. Space, Time, and Adynamical Explanation in the Relational Blockworld ................................................................. 203
   W.M. Stuckey, Michael Silberstein and Timothy McDevitt

17. Spacetime Is Doomed ....................................................... 217
   George Musser

Part III  Mathematics

18. Geometry and Physical Space ........................................... 231
   Mary Leng

19. The Geometry of Manifolds and the Perception of Space ........ 239
   Raymond O. Wells Jr.

20. Paradox? the Mathematics of Space-Time and the Limits of Human Understanding ................................................. 253
   Paul Ernest

21. “Now” Has an Infinitesimal Positive Duration ....................... 271
   Reuben Hersh

22. What’s Wrong with the Platonic Ideal of Space and Time? ...... 279
   Lorenzo Sadun

23. The Fundamental Problem of Dynamics ................................ 287
   Julian Barbour

24. General Relativity, Time, and Determinism .......................... 299
   James Isenberg
25. Topos Theoretic Approach to Space and Time  
   Goro C. Kato  

Part IV  Biology/Cognitive Science  

26. Syntactic Space  
   Rajesh Kasturirangan  

27. Time Measurement in Living Systems: Human Understanding and Health Implications  
   Lakshman Abhilash and Vijay Kumar Sharma  

28. The Cellular Space—The Space of Life  
   Pier Luigi Luisi  

29. The Consciousness of Space, the Space of Consciousness  
   Mauro Bergonzi and Pier Luigi Luisi  

30. Time and Suffering: False Metaphors, (De-)Synchronous Times, and Internal Dynamics  
   Norman Sieroka  

31. Evolutionary Time and the Creation of the Space of Life  
   Randall E. Auxier  

Part V  Logic/Computer Science  

32. A Computational Mathematics View of Space, Time and Complexity  
   David H. Bailey and Jonathan M. Borwein  

33. ‘Photographing the Footsteps of Time’: Space and Time in Charles Babbage’s Calculating Engines  
   Doron Swade  

34. The Black Hole in Mathematics  
   Alexander Keewatin Dewdney  

35. Gödel Incompleteness and the Empirical Sciences  
   N.C.A. da Costa and F.A. Doria  

36. Gödel’s Ontological Dreams  
   Gary Mar  

Part VI  Miscellaneous  

37. The Novel and the Map: Spatiotemporal Form and Discourse in Literary Cartography  
   Robert T. Tally Jr.
38. Time, Space, and the Human Geographies of Opportunity ....... 487
   Donald G. Janelle

39. Losing Time and Space: Experiencing Immersion ............ 503
   Diana J. Reichenbach

Science, Mind, and Limits of Understanding ..................... 513

Authors Information—Affiliation/Mailing Address
   and Email Information ........................................ 523

Titles in this Series ............................................. 527