

LIST OF PUBLICATIONS

(Claus Kiefer)

1. BOOKS – Author

1. *Decoherence and the Appearance of a Classical World in Quantum Theory*, Springer, Berlin (1996). Second edition 2003.
(with E. Joos, H. D. Zeh, D. Giulini, J. Kupsch, and I.-O. Stamatescu)
2. *Quantentheorie*, S. Fischer, Frankfurt am Main (2002). Third edition 2004.
3. *Gravitation*, S. Fischer, Frankfurt am Main (2003).
4. *Quantum Gravity*, Oxford University Press, Oxford (2004). Third edition 2012.
5. *Der Quantenkosmos*, S. Fischer, Frankfurt am Main (2008). Third edition 2009.
6. Editor of: *A. Einstein, B. Podolsky, N. Rosen: Kann die quantenmechanische Beschreibung der physikalischen Realität als vollständig betrachtet werden?*, Klassische Texte der Wissenschaft (Springer Spektrum, Berlin, 2015).
7. Editor of: *A. Einstein, B. Podolsky, N. Rosen: Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?*, Classic Texts in the Sciences (Springer, Cham, 2022).
8. *Gravitationswellen* (Springer Spektrum, Wiesbaden, 2017).
(with D. Giulini)

2. Books - Editor

9. *Black Holes: Theory and Observation*,
Lecture Notes in Physics 514, Springer, Berlin (1998).
(joint editor with F.W. Hehl and R. Metzler)
10. *Decoherence: Theoretical, Experimental, and Conceptual Problems*,
Lecture Notes in Physics 538, Springer, Berlin (2000).
(joint editor with P. Blanchard, D. Giulini, E. Joos, and I.-O. Stamatescu)
11. *Quantum Gravity: From Theory to Experimental Search*,
Lecture Notes in Physics 631, Springer, Berlin (2003).
(joint editor with D. Giulini and C. Lämmerzahl)
12. *Proceedings, 7th International Workshop : Spacetime - Matter - Quantum Mechanics. (DICE2014) : Castiglioncello, Tuscany, Italy, September 15-19, 2014, Journal of Physics, Conference Series, 626* (2015).
(joint editor with H. T. Elze, L. Diósi, L. Fronzoni, J. J. Halliwell, E. Prati, and G. Vitiello)
13. *Proceedings, 8th International Workshop : Spacetime - Matter - Quantum Mechanics. (DICE2016) : Castiglioncello, Tuscany, Italy, September 12-16, 2014, Journal of Physics, Conference Series, 880* (2017).
(joint editor with H. T. Elze, L. Diósi, L. Fronzoni, J. J. Halliwell, E. Prati, and G. Vitiello)
14. *Proceedings, 9th International Workshop : Spacetime - Matter - Quantum Mechanics. (DICE2018) : Castiglioncello, Tuscany, Italy, September 17-21, 2018, Journal of Physics, Conference Series, 1275* (2019).
(joint editor with H. T. Elze, M. Blasone, L. Diósi, L. Fronzoni, J. J. Halliwell, E. Prati, and G. Vitiello)
15. *One Hundred Years of Gauge Theory*,
Fundamental Theories of Physics, Volume 199 (Springer, Cham, 2020).
(joint editor with S. De Bianchi)
16. *From Quantum to Classical*,
Fundamental Theories of Physics, Volume 204 (Springer, Cham, 2022).
17. *Proceedings, 10th International Workshop : Spacetime - Matter - Quantum Mechanics. (DICE2022) : Castiglioncello, Tuscany, Italy, September 19-23, 2022, Journal of Physics, Conference Series, 2533* (2023).

(joint editor with H. T. Elze, M. Blasone, L. Diósi, L. Fronzoni, J. J. Halliwell, E. Prati, and G. Vitiello)

3. REVIEWS

18. Kosmologische Grundlagen der Irreversibilität,
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19. The semiclassical approximation to quantum gravity,
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20. Das Informationsproblem bei Schwarzen Löchern,
Physikalische Blätter **52**, 366–367 (1996).
21. Quanteneigenschaften Schwarzer Löcher,
Physik in unserer Zeit **28**, 22–30 (1997).
22. Towards a full quantum theory of black holes,
in: *Black Holes: Theory and Observation*, edited by F.W. Hehl, C.
Kiefer, and R. Metzler (Springer, Berlin, 1998), pp. 416–450.
23. Decoherence: Concepts and Examples,
in: *Quantum Future*, edited by P. Blanchard and A. Jadczyk (Springer,
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(with E. Joos)
24. Thermodynamics of black holes and Hawking radiation,
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U. Moschella (IOP Publishing, Bristol, 1999), pp. 17–74.
25. Conceptual issues in quantum cosmology,
in: *Towards quantum gravity*, edited by J. Kowalski-Glikman (Springer,
Berlin, 2000), pp. 158–187.
26. On the interaction of mesoscopic quantum systems with gravity,
Annalen der Physik **14**, 253–278 (2005).
(with C. Weber)
27. Einstein und die Folgen, Teil I,
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28. Einstein und die Folgen, Teil II,
Physik in unserer Zeit **36** (March), 70–74 (2005).
29. Quantum gravity: General introduction and recent developments,
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30. Quantum Cosmology,
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(with B. Sandhöfer)
31. Wege zu einer Vereinheitlichung von Gravitation und Quantentheorie,
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32. Auf dem Weg zur Quantengravitation,
Spektrum der Wissenschaft, Heft 4/2012, 34–43. Also available in *Spektrum der Wissenschaft spezial* (Physik, Mathematik, Technik), Heft 1/13, 48–57 (2013).
33. Conceptual Problems in Quantum Gravity and Quantum Cosmology ,
ISRN Mathematical Physics, **2013**, article ID 509316 (2013).
34. Einsteins Suche nach der vereinheitlichten Feldtheorie,
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4. CONTRIBUTIONS TO BOOKS

35. Quantum gravitational effects in De Sitter space,
in: *New Frontiers in Gravitation*, edited by G. Sardanashvily (Hadronic Press, Palm Harbor, 1996), pp. 203–214.
36. *Lexikon der Physik* (Spektrum, Heidelberg, 1998ff.):
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37. Path integrals in quantum cosmology,
in: *Fluctuating paths and fields*, edited by W. Janke, A. Pelster, H.-J. Schmidt, and M. Bachmann (World Scientific, Singapore, 2001), pp. 729–740.

38. Zeitpfeil,
in: *Der Brockhaus Naturwissenschaften und Technik* (Spektrum, Heidelberg, 2002), pp. 2220–2222.
39. On the interpretation of quantum theory – from Copenhagen to the present day,
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41. Why quantum gravity?,
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42. The canonical approach to quantum gravity: General ideas and geometrodynamics,
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(with D. Giulini)
43. CPT theorem,
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44. Quantum gravity (general) and applications,
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45. Can the Arrow of Time be understood from Quantum Cosmology?
in: *The Arrows of Time*, edited by L. Mersini-Houghton and R. Vaas (Springer, Berlin, 2012), pp. 191–203.
46. Zur Geschichte der Astronomie und Physik in Köln,
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47. Aktuelle Forschungsthemen der Gravitationsphysik,
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48. Time in Quantum Gravity,
in: *The Oxford Handbook of Philosophy of Time*, edited by C. Callender
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49. Quantengravitation,
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50. Weizsäckers Zeitbegriff aus heutiger Sicht,
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51. Quantum Gravity,
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52. Die Rolle der Zeit in der Kosmologie,
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2015), p. 25–33.
53. Ist die Natur unscharf? Die Rolle der Quantenphysik,
in: *Interdisziplinäres Plenum Unschärfe*, herausgegeben von der Nordrhein-
Westfälischen Akademie der Wissenschaften und der Künste (Ferdin-
and Schöningh, Paderborn, 2016), p. 29–43.
54. Notes on semiclassical Weyl gravity,
in: *Gravity and the Quantum*, edited by J. Singh Bagla and S. Engineer
(Springer, Berlin, 2017), pp. 127–143.
(with B. Nikolić)
55. Ist das Universum endlich oder unendlich? Die Rolle der Quantenthe-
orie,
in: *Unendlichkeit, Ewigkeit und der Mönch von Heisterbach* (Verlag
Kurt Roessler, Bornheim, 2018), pp. 41–46.
56. Space, Time, Matter in Quantum Gravity,
in: *One Hundred Years of Gauge Theories*, edited by S. De Bianchi and
C. Kiefer, pp. 199–215. (Springer, Berlin, 2020).
57. The impact of Friedmann’s work on cosmology,
in: *Saint Petersburg mathematicians and their discoveries*, edited by
N. Kalinin *et al* (ISBN 978-5-4439-4648-1, 2024), pp. 233–239.
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58. Gibt es Grenzen der physikalischen Naturbeschreibung? – Die Sehnsucht nach einer vereinheitlichten Theorie,
in: *Unbestimmt oder relativ?*, edited by H. Fink and M. Kuhlmann (Springer, Berlin, 2023), pp. 181–191.
59. Quantum gravity - an unfinished revolution,
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60. What does it mean for our world-view if we assume with Gödel the nonexistence of time?,
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5. REFEREED ARTICLES

61. Observation of the comet Stephan-Oterma (1980g) at the Observatory of Heidelberg,
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(with U. Görze)
62. On the construction of the U-matrix from Dirac brackets,
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(with K.D. Rothe)
63. Dirac-Bracket formulation of QED in the superaxial gauge: second order formulation,
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(with K.D. Rothe)
64. Continuous measurement of minisuperspace variables by higher multipoles,
Classical and Quantum Gravity **4**, 1369–1382 (1987).
65. Wave packets in minisuperspace,
Physical Review D **38**, 1761–1772 (1988).
66. Continuous measurement of intrinsic time by fermions,
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67. Non-minimally coupled scalar fields and the initial value problem in quantum gravity,
Physics Letters B **225**, 227–232 (1989).
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(with M. Heusler and N. Straumann)
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72. Interpretation of the decoherence functional in quantum cosmology,
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73. Quantum gravitational corrections to the functional Schrödinger equation,
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(with T.P. Singh)
74. A comparison between semiclassical gravity and semiclassical electrodynamics,
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78. On time and the quantum-to-classical transition in Jordan-Brans-Dicke quantum gravity,
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(with E. Martínez)

79. Functional Schrödinger equation for fermions in external gauge fields,
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(with A. Wipf)
80. Quantum gravity and non-unitarity in black hole evaporation,
Modern Physics Letters A **9**, 2661–2669 (1994).
(with R. Müller and T. P. Singh)
81. Wheeler-DeWitt metric and the attractivity of gravity,
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(with D. Giulini)
82. Arrow of time in a recollapsing quantum universe,
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(with H. D. Zeh)
83. Consistency of semiclassical gravity,
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(with D. Giulini)
84. Symmetries, superselection rules, and decoherence,
Physics Letters A **199**, 291–298 (1995).
(with D. Giulini and H. D. Zeh)
85. Decoherence of black holes by Hawking radiation,
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(with J.-G. Demers)
86. Ehrenfest’s principle and the problem of time in quantum gravity,
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87. Semiclassical black hole states and entropy,
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88. Boundary conditions in quantum string cosmology,
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89. Wheeler-DeWitt equation and Feynman diagrams,
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(with A.O. Barvinsky)

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(with D. Polarski and A.A. Starobinsky)
91. Emergence of classicality for primordial fluctuations:
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(with D. Polarski)
92. The coherence of primordial fluctuations produced during inflation,
Classical and Quantum Gravity **15**, L67–L72 (1998).
(with J. Lesgourgues, D. Polarski and A.A. Starobinsky)
93. Answer to Question #60. Interference of two independent sources,
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94. Hamiltonian evolution and quantization for extremal black holes,
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95. Decoherence in quantum cosmology at the onset of inflation,
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96. Effective action and decoherence by fermions in quantum cosmology,
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(with P. Hájíček)

101. Singularity avoidance by collapsing shells in quantum gravity,
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103. Primordial black holes from inflationary models with and without broken scale invariance,
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 (with L. Diósi)
105. Can primordial black holes be a significant part of dark matter?,
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 117. Hawking radiation from the quantum Lemaître-Tolman-Bondi model,
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(with J. Müller-Hill, T. P. Singh, and C. Vaz)
 118. Quantum cosmology with a big-brake singularity,
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123. Quantum geometrodynamics: whence, whither?,
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(with M. Bouhmadi-López, B. Sandhöfer, and P. Vargas Moniz)
126. Why do cosmological perturbations look classical to us?
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127. Indefinite oscillators and black-hole evaporation,
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(with M. Bouhmadi-López and M. Krämer)
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(with G. Menezes and J. Marino)
 148. The Milky Way's Supermassive Black Hole: How good a case is it? A Challenge for Astrophysics and Philosophy of Science,
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(with A. Eckart, A. Hüttemann, S. Britzen, C. Lämmerzahl, M. Zajaček, M. Stöckler, M. Valencia-S., V. Karas, and M. García-Marín)
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