

A. Papers Published in Refereed Journals:

Physics and Astronomy Research

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5. "SCALAR WAVES IN THE MIXMASTER UNIVERSE II. Particle Creation"  
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6. "SEPARATION OF TENSOR EQUATIONS IN A HOMOGENEOUS SPACE BY GROUP THEORETICAL METHODS"  
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7. "CONFORMAL ENERGY-MOMENTUM TENSOR IN CURVED SPACETIMES: Adiabatic Regularization and Renormalization"  
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10. "ANISOTROPY DAMPING THROUGH QUANTUM EFFECTS IN THE EARLY UNIVERSE"  
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13. "TRACE ANOMALY OF THE ENERGY-MOMENTUM TENSOR OF QUANTIZED SCALAR FIELDS IN ROBERTSON-WALKER SPACETIME" Physics Letters 71A, 169-173 (1979)
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15. "QUANTUM EFFECTS IN THE EARLY UNIVERSE II. Effective Action for Scalar Fields in Homogeneous Cosmologies with Small Anisotropy" J. B. Hartle and B. L. Hu, Physical Review D20, 1772 (1979).
16. "QUANTUM EFFECTS IN THE EARLY UNIVERSE III. Dissipation of Anisotropy by Scalar Particle Production" J. B. Hartle and B. L. Hu, Physical Review D21, 2756 (1980).
17. "THE INFLUENCE OF COSMOLOGICAL GRAVITATIONAL WAVES ON A NEWTONIAN BINARY SYSTEM" B. Mashhoon, B. J. Carr and B. L. Hu, Astrophysical Journal 246, 569 (1981).
18. "EFFECT OF FINITE TEMPERATURE QUANTUM FIELDS ON THE EARLY UNIVERSE" Physics Letters 103B, 331 (1981).
19. "FINITE TEMPERATURE QUANTUM FIELDS IN EXPANDING UNIVERSES" Physics Letters 108B, 19 (1982).
20. "VACUUM VISCOSITY DESCRIPTION OF QUANTUM PROCESSES IN THE EARLY UNIVERSE" Physics Letters 90A, 375 (1982).
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132. **Emergent /Quantum Gravity: Macro/Micro Structures Spacetime** in DICE2008 September 22–26, 2008, Castello Pasquini/Castiglioncello (Tuscany), Italy, in *J. Phys. Conf. Ser.* **174** (2009) 012015 [[arXiv:0903.0878](#)]
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134. **Nonequilibrium Casimir-Polder Force from Influence Functional**, R. Behunin and B. L. Hu, *J. Phys. A: Math. Theor.* **43** (Fast Track) 012001 (2010) [[arXiv:0907.3212](#)]
135. **Entanglement Creation between Two Causally-Disconnected Objects**, Shih-Yuin Lin and B. L. Hu, *Phys. Rev. D* **81**, 045019 (2010) [[arXiv:0910.5858](#)]
136. **Quantum Entanglement and Entropy in Particle Creation**, Shih-Yuin Lin, Chung-Hsien Chou and B. L. Hu, *Phys. Rev. D* **81**, 084018 (2010) [[arXiv:1001.4922](#)]
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137. **Vortex Formation in Two-Dimensional Bose Gas**, E. Calzetta, Kwan-yuet Ho and B. L. Hu, J. Phys. B: At. Mol. Opt. Phys. 43 (2010) 095004. [arXiv:0910.4225](#)
138. **Nonequilibrium Forces between two Neutral Atoms Mediated by a Quantum Field** Ryan Behunin and B. L. Hu, Phys. Rev. A 82, 022507 (2010) [[arXiv:1002.2728](#)]
139. **The Rotating Wave Approximation: Consistency and Applicability from a Quantum Open Systems Analysis**, Chris Fleming, Nicholas Cummings, C. Anastopoulos and B. L. Hu, J. Phys. A: Math. Theor. 43 (2010) 405304. [[arXiv:1003.1749](#)]
140. **Exact analytical solutions to the master equation of quantum Brownian motion for a general environment** Chris Fleming, A. Roura and B. L. Hu, Ann. Phys. (NY) 326 (2011) 1207–1258 [[arXiv:1004.1603](#)] [doi:10.1016/j.aop.2010.12.003](#)
141. **Nonequilibrium Atom-Dielectric Forces Mediated by a Quantum Field** [Ryan Orson Behunin](#), [Bei-Lok Hu](#), Phys. Rev. A 84, 012902 (2011)
142. **Gravity and Nonequilibrium Thermodynamics of Classical Matter** Int. J Mod. Phys. D **20**:697-716 (2011) [[arXiv:1010.5837](#)]
143. **Macroscopic Quantum Phenomena from the Large N Perspective** C. H. Chou, B. L. Hu and Y. Subasi in the 5<sup>th</sup> DICE meeting September 2010, Castello Pasquini/ Castiglioncello (Tuscany), Italy, J. Phys. Conf. Ser. **306** 012002 (2011) [arXiv:1106.0556](#)
144. **Macroscopic Quantum Phenomena from the Correlation, Coupling and Criticality Perspectives** C. H. Chou, B. L. Hu and Y. Subasi in the 2010 IARD Conference, May 2010 Hualien, Taiwan, J. Phys. Conf. Ser. **330**, 012003 (2011) [arXiv:1107.3008v1](#) [doi:10.1088/1742-6596/330/1/012003](#)
145. **Correlations of the stress-energy tensor in AdS spaces via the generalized zeta-function method** H. T. Cho and B. L. Hu, IARD2010 Conference, Hualien, Taiwan (May 2010), J. Physics (Conf. Ser.) **330**, 012002 (2011) [arXiv:1105.5302](#)
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147. **Initial state preparation with dynamically generated system-environment correlations** C. H. Fleming, B. L. Hu and A. Roura, Phys. Rev. E **84**, 021106 (2011) [[arXiv:1101.2668](#) ]
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**148. Effect of Interatomic Separation on Entanglement Dynamics in a Two-Atom Two-Mode Model** [K. Sinha](#), [N.I. Cummings](#), [B.L. Hu](#) *J. Phys. B: At. Mol. Opt. Phys.* 45 (2012) 035503 DOI: [10.1088/0953-4075/45/3/035503](#) [[arXiv:1108.2681](#)]

**149. Non-Markovian Dynamics and Entanglement of Two-level Atoms in a Common Field** Chris Fleming, Nicholas Cummings, C. Anastopoulos and B. L. Hu, *J. Phys. A: Math. Theor.* 45 (2012) 065301. [[arXiv:1101.2668](#)]

**150. Quantum and Classical Fluctuation Theorems from a Decoherent-histories Open-system Analysis**  
Yigit Subasi and B. L. Hu, *Phys. Rev. E* 85, 011112 (2012) [arXiv:1109.6696v1](#)

**151. Non-Markovian Dynamics of Open Quantum Systems: Stochastic Equations and their Perturbative Solutions**  
C. H. Fleming and B. L. Hu, *Ann. Phys. (N.Y.)* 327 (2012), pp. 1238-1276  
[arXiv:1112.0252](#)

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[arXiv:1011.4903](#)

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H. T. Cho and B. L. Hu, *J. Phys. A: Math. Theor.* 45 (2012) 374013. Special Issue in honour of J. Stuart Dowker [doi:10.1088/1751-8113/45/37/374013](#) [[arXiv:1202.0732](#)]

**154. The Decoherence Strength of Non-Markovian Environments**  
C. H. Fleming, B. L. Hu and A. Roura, *Physica A* 391 (2012), 4206-4214  
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**155. Emergence: Key Physical Issues for Deeper Philosophical Inquires** Invited talk, International Conference on Self-Organization and Emergence: Emergent Quantum Mechanics (EmerQuM11) November 10th–13th Vienna, Austria. *J. Phys. Conf. Ser.* 361 (2012) 012003 [[arXiv:1204.1077](#)]  
[10.1088/1742-6596/361/1/012003](#)

**156. Nonequilibrium dynamics of charged particles in an electromagnetic field: Causal and stable backreaction via  $1/c$  expansion in QED** C. H. Fleming, Philip Johnson and B. L. Hu, *J. Phys. A: Math. Theor.* 45 (2012) 255002 [[arXiv:1106.1886](#)]

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David Ostashuk, S. Y. Lin, R. Mann and B. L. Hu, JHEP 07 (2012) 072  
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**158. Entanglement between Oscillators in Relativistic Motion and a Quantum Field**, B. L. Hu, S. Y. Lin and J. Louko, Class. Quant. Grav. **29** (2012) [224005](https://doi.org/10.1088/0251-9180/29/12/124005). *Special Issue on Relativistic Quantum Information* [arXiv:1205.1328].

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C. Anastopoulos and B. L. Hu, Class. Quant. Grav. **30**, 165007 (2013)  
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- 169. Noise kernels of stochastic gravity in conformally-flat spacetimes**  
H. T. Cho and B. L. Hu, Class. Quantum Grav. 32 (2015) 055006.  
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- 170. Quantum Teleportation between Moving Detectors**  
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- 171. Probing a Gravitational Cat State**  
C. Anastopoulos and B. L. Hu, Class. Quant. Grav. **32**, 165022 (2015).  
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- 172. Nonequilibrium Steady State in Open Quantum Systems: Influence Action, Stochastic Equation and Power Balance**  
J. T. Hsiang and B. L. Hu, Annals of Physics **362**, 139-169 (2015)  
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- 173. Mirror-Field Entanglement in a Microscopic model for Quantum Optomechanics** Kanupriya Sinha, S. Y. Lin and B. L. Hu,  
Phys. Rev. A **92**, 023852 (2015) [arXiv:1502.00615]
- 174. Distance and Coupling Dependence of Entanglement in the Presence of a Quantum Field**  
J. T. Hsiang and B. L. Hu, Phys. Rev. D **92**, 125026 (2015) [arXiv:1505.03007]
- 175. “Hot Entanglement”? -- A Nonequilibrium Quantum Field Theory Scrutiny**  
J. T. Hsiang and B. L. Hu, Phys. Lett. B **750**, 396 (2015) [arXiv:1506.02941]
- 176. Quantum Entanglement at High Temperatures? -- Bosonic Systems in Nonequilibrium Steady State**  
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- 177. Entanglement Dynamics of Detectors in an Einstein Cylinder**  
S. Y. Lin, C. H. Chou and B. L. Hu, JHEP 03 (2016) 047 [arXiv:1508.06221]
- 178. Probing a Gravitational Cat State: Experimental Possibilities**  
M. Derakhshani, Charis Anastopoulos and B. L. Hu, Third International Conference on Emergent Quantum Mechanics, EmQM2015, Technical University Vienna, October 23-25, 2015 J. Phys. Conf. Ser. (2016) [arXiv:1603.04430](https://arxiv.org/abs/1603.04430)
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**Bose-Novae as Squeezing of the Vacuum by Condensate Dynamics**

Esteban Calzetta and B. L. Hu [cond-mat/0208569]

**Thermalization of an Interacting Quantum Field in the CTP-2PI Next-to-leading-order Large N Scheme** E. Calzetta, B. L. Hu [hep-ph/0205271]

**Gauge-Invariant Effective Action for the Dynamics of Bose-Einstein Condensates with a fixed number of atoms**

E. Calzetta and B. L. Hu, [cond-mat/0508240]

**Quantum Entanglement under Non-Markovian Dynamics of Two Qubits Interacting with a Common Electromagnetic Field,**

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C. H. Fleming, B. L. Hu and A. Roura [arXiv: [0705.2766](https://arxiv.org/abs/0705.2766)]

**New analytical methods for gravitational radiation and reaction in binaries with arbitrary mass ratio and relative velocity**

Invited talk at IARD Conference, Aristotle University, Thessaloniki, Greece, 22-26 June 2008. C. R. Galley and B. L. Hu [[arXiv:0906.0968](https://arxiv.org/abs/0906.0968)]

**Protecting and Dynamically Generating Entanglement in a Two-Atom Two-Field-Mode Model** K. Sinha, N. Cummings and B. L. Hu,

[arXiv:1004.1834](https://arxiv.org/abs/1004.1834)

**Quantum Brownian motion of multipartite systems and their entanglement dynamics** C. H. Fleming, Albert Roura, B. L. Hu,

[[arXiv:1106.5752](https://arxiv.org/abs/1106.5752)]

**Autangle: A case of Quantum Narcissism?**

Rong Zhou, R. Behunin, S. Y. Lin and B. L. Hu [arXiv:1201.0541](https://arxiv.org/abs/1201.0541)

**Newton-Schrödinger Equations are not derivable from General Relativity + Quantum Field Theory** C. Anastopoulos and B. L. Hu

[[arXiv:1402.3813](https://arxiv.org/abs/1402.3813)] Comments on H. Yang et al, Phys. Rev. Lett. 110, 170401 (2013)

**Quantum Teleportation between Moving Dectectors in a Quantum Field** Shih-Yuin Lin, Kazutomu Shiokawa, C. H. Chou and B. L. Hu,

[[arXiv:1204.1525](https://arxiv.org/abs/1204.1525)]

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## **B. Papers Presented at Scientific Meetings:**

### **1. Invited Papers**

1. "QUANTUM FIELD THEORIES AND RELATIVISTIC COSMOLOGY"  
Plenary talk given at the 2nd Marcel Grossmann Meeting on *Developments in General Relativity*, Trieste, Italy, July, 1979. Published in the Proceeding edited by R. Ruffini (North-Holland Publishing Co., Amsterdam, 1982).

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2. "ELEMENTARY PARTICLE PHYSICS AND COSMOLOGY"  
Plenary talk given at Guangzhou Conference on Particle Physics, January 1980, Conghua, China. Published in the Proceedings edited by Hu Ning (Science Press, Beijing, China, 1980).

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3. "EFFECT OF FINITE TEMPERATURE QUANTUM FIELDS IN THE EARLY UNIVERSE" Invited talk at the Workshop on the Interaction of Particle Physics and Astrophysics, May 1981, Santa Barbara.

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4. "SYMMETRY BEHAVIOR AT FINITE TEMPERATURE IN DYNAMIC SPACETIMES" Invited talk given at the Nuffield Workshop on the Very Early Universe, Cambridge, England, July 1982. Published in "The Very Early Universe", edited by G. W. Gibbons, S. W. Hawking and S. Siklos (Cambridge University Press, Cambridge, 1983).

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5. "FINITE TEMPERATURE QUANTUM PROCESSES IN THE EARLY UNIVERSE" Invited talk given at the 3rd Marcel Grossmann Meeting on Recent Developments in General Relativity, August 1982, Shanghai, China. Proceedings edited by Hu Ning (Science Press, Beijing, 1983).

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6. "ON THE DISSIPATIVE NATURE OF QUANTUM GRAVITATIONAL PROCESSES"  
Invited talk given at the Second New Orleans Conference on Quantum Theory and Gravitation, May 1983, New Orleans.
7. "SPACETIME DYNAMICS AND FINITE TEMPERATURE EFFECTS ON SYMMETRY RESTORATION"  
Invited talk at the Workshop on the Early Universe at the 10th International Conference on General Relativity and Gravitation, Padova, July 1983. Proceedings edited by B. Bertotti, F. deFelice and A. Pascolini.
8. "QUASI-LOCAL EFFECTIVE LAGRANGIAN IN CURVED SPACETIME"  
Invited talk given at the Induced Gravity Workshop, Oct. 1983, Erice, Italy.

9. "NOTES ON COSMOLOGICAL PHASE TRANSITIONS"  
Invited talk at the Inner Space/Outer Space Conference, Fermi Lab, May 1984. Published in the Proceedings edited by E. Kolb et al (University of Chicago Press, Chicago, 1986). pp 479-483.
10. "CAN QUANTUM GRAVITATIONAL EFFECTS PREVENT INFLATION?"  
Invited talk given at the International Workshop on Gauge Theory, Gravitation and the Early Universe, Nov. 1984, Ahmedabad, India, and at the Raman Institute of Physics, Bangalore, India.
11. "QUANTUM GEOMETRIC EFFECTS AND INFLATIONARY COSMOLOGY"  
Invited talk given at the Workshop on "Classical and Quantum Gravity" May 1985, Syracuse, New York.
12. "GEOMETRIC EFFECTS IN COSMOLOGICAL PHASE TRANSITION"  
Invited talk given at the "Particle and the Universe" International Symposium, Thessaloniki, Greece, June 1985. Proceedings edited by G. Lazarides and Q. Shafi, (Elsevier Science Publishing Co., N.Y. 1986).
13. "PHASE TRANSITIONS IN THE EARLY UNIVERSE: Geometric Effects"  
Plenary talk given at the 4th Marcel Grossmann Meeting on Recent Developments in General Relativity, Rome, Italy, June 1985. Published in Proceedings edited by R. Ruffini (North-Holland Publishing Co., Amsterdam, 1986).
14. "WIGNER FUNCTION AND QUANTUM LIOUVILLE EQUATION IN CURVED SPACETIME" E. Calzetta and B. L. Hu.  
Invited talk given at the First International Conference on the Physics of Phase Space, College Park, Maryland, May 1986. Proceedings edited by Y. S. Kim and W. W. Zachary, (Springer-Verlag, Berlin 1986)
15. "THE EARLY UNIVERSE AND PARTICLE PHYSICS".  
Invited talk at the New York State American Physical Society Meeting on Cosmology and Particle Physics, Oct. 1986, Syracuse.
16. "DYNAMICAL FINITE SIZE EFFECT, INFLATIONARY COSMOLOGY AND THERMAL PARTICLE PRODUCTION"  
Invited talk given at the CAP-NSERC Summer Institute in Theoretical Physics, Edmonton, Canada, July 1987. Proceedings edited by K. Khanna, G. Kunstatter and H. Umezawa (World Scientific Publishing Co., Singapore, 1988).
17. "QUANTUM THEORIES OF THE EARLY UNIVERSE: A Critical Appraisal" Invited talk given at the International Conference on Gravitation and Cosmology, Dec. 1987. Goa, India.

Proceedings edited by B. Iyer and C. V. Vishveshwara  
(Cambridge University Press, Cambridge 1989).

18. "COSMOLOGY AS 'CONDENSED MATTER' PHYSICS"  
Invited talk given at the Third Asia-Pacific Physics Conference, Hong Kong, June 1988. Proceedings edited by K. Young  
(World Scientific Publishing Co., Singapore, 1989). [gr-qc/9511076]
19. "THE ROLE OF GRAVITY IN QUANTUM PROCESSES IN CURVED SPACE"  
Invited talk given at the Fifth Marcel Grossmann Meeting, Perth, Australia, August 1988. Proceedings edited by D. Blair and M. J. Buckingham (World Scientific Publishing Co., Singapore, 1989).
20. "ON THE NATURE OF DISSIPATION IN SEMI-CLASSICAL GRAVITATIONAL THEORIES"  
Invited talk given at the Workshop on Thermal Fields and Applications, Cleveland, October 1988. Proceedings in Physica A158 (1989).
21. "QUANTUM EFFECTS OF SUPERSPACE COSMOLOGY"  
Invited lectures at the 11th Course of the International School on Cosmology and Gravitation, Erice, Italy, May 1989. Published in Quantum Mechanics in Curved Space-Time, edited by J. Audretsch and V. de Sabbata (Plenum, London 1990).
22. "COARSE-GRAINED EFFECTIVE ACTION AND INFLATIONARY COSMOLOGY" B. L. Hu and Yuhong Zhang  
Invited talk at the Quantum Field Theory in Curved Space-Time Workshop in GR12, Boulder, Colorado, July 1989.
23. "MINISUPERSPACE COSMOLOGY AS THE INFRARED LIMIT OF QUANTUM GRAVITY" B. L. Hu and Sukanya Sinha  
Invited talk at the Quantum Field Theory in Curved Space-Time Workshop in GR12, Boulder, Colorado, July 1989.
24. "STATISTICAL MECHANICS AND QUANTUM COSMOLOGY"  
Invited talk given at the 2nd International Workshop on Thermal Fields and Applications, Tsukuba, Japan, July, 1990. Proceedings appeared as Thermal Field Theories, edited by T. Ezawa et al (North-Holland, Amsterdam 1991). gr-qc/9511079.
25. "COARSE-GRAINING AND BACKREACTION IN INFLATIONARY AND MINISUPERSPACE COSMOLOGY,"  
Invited Lectures at the Seventh International Latin-American Symposium on General Relativity (SILARG VII). Proceeding appeared as Relativity and Gravitation: Classical and Quantum, edited by J. D'Olivo et al (World Scientific, Singapore, 1991).

26. "FLUCTUATION, DISSIPATION AND IRREVERSIBILITY IN COSMOLOGY" Invited Talk at the Workshop on The Physical Origin of Time-Asymmetry, Huelva, Spain, Oct. 1991. Proceedings edited by J. J. Halliwell, J. Perez-Mercader and W. H. Zurek (Cambridge University, Cambridge, 1994). gr-qc/9302021.
  
27. "QUANTUM ORIGIN OF NOISE AND FLUCTUATION IN COSMOLOGY" Invited Talk at the International Conference on the Origin of Structure in the Universe, Chateau de Pont d'Oye, Belgium April, 1992. Proceedings edited by E. Gunzig, P. Nardonn (NATO ASI Series, Kluwer, Dordrecht, 1993) gr-qc/9512049.
  
28. "QUANTUM AND THERMAL FLUCTUATIONS, UNCERTAINTY PRINCIPLE, DECOHERENCE AND CLASSICALITY" Invited Talk at the Third International Workshop on Quantum Nonintegrability, Drexel University, Philadelphia, May, 1992. Published in "Quantum Dynamics of Chaotic Systems," edited by J. M. Yuan, D. H. Feng and G. M. Zaslavsky (Gordon and Breach, Philadelphia, 1993) gr-qc/9302029.
  
29. "QUANTUM NOISE IN GRAVITATION AND COSMOLOGY" Invited Talk at the Workshop on Fluctuation and Order, Los Alamos National Laboratory, Sept. 1993. Proceedings published in the Santa Fe Institute Series, ed. M. Millonas (Springer-Verlag, Berlin, 1994) astro-ph/9312012.
  
30. "QUANTUM STATISTICAL FIELD THEORY IN GRAVITATION AND COSMOLOGY" Invited Lectures at the Third International Workshop on Thermal Fields and Applications, Banff, Canada, Aug. 1993. Proceedings ed. R. Kobe, G. Kunstatter (World Scientific, 1994) gr-qc/9403061.
  
31. "NONEQUILIBRIUM QUANTUM FIELDS IN COSMOLOGY: Comments on Current Selected Topics" Invited Talk at the Second Paris Cosmology Colloquium Observatoire de Paris, Paris, June 2-4, 1994. Proceedings edited by H. de Vega and N. Sanchez (World Scientific, Singapore, 1995) gr-qc/9409053.
  
32. "CORRELATIONS, DECOHERENCE, DISSIPATION AND NOISE IN QUANTUM FIELD THEORY" E. Calzetta and B. L. Hu, Invited Talk at the International Workshop on Heat Kernel Techniques and Quantum Gravity, University of Winnipeg, Canada, August 1994. Proceedings published as Discourses in the Mathematics and Its Applications No. 4, edited by S. A. Fulling (Texas A & M University Press, College Station, 1995) hep-th/9501040.
  
33. "ENVIRONMENT-INDUCED EFFECTS IN QUANTUM CHAOS:

DECOHERENCE, DELOCALIZATION AND IRREVERSIBILITY"  
K. Shiokawa and B. L. Hu  
Invited Talk at the International Symposium on Quantum Classical  
Correspondence, Drexel University, Philadelphia, Sept. 1994, Proceedings  
eds D. H. Feng and B. L. Hu (International Press, Boston, 1997).

34. "SEMICLASSICAL GRAVITY AND MESOSCOPIC PHYSICS"  
Invited Talk at the International Symposium on Quantum Classical  
Correspondence, Drexel University, Philadelphia, Sept. 1994, Proceedings  
eds D. H. Feng and B. L. Hu (International Publishers, Boston, 1997)  
g-qc/9511077.
35. "HAWKING-UNRUH EFFECT AS RELATIVISTIC EXPONENTIAL  
SCALING OF QUANTUM NOISE"  
Invited talk at the 4th International Workshop on Thermal Field Theory  
and Applications, Dalian, China, August 1995, Proceedings edited by Y. X.  
Gui and F. C. Khanna (World Scientific, Singapore, 1996) gr-qc/9606973
36. "CORRELATION DYNAMICS OF QUANTUM FIELDS AND BLACK HOLE  
INFORMATION PARADOX"  
Invited talk at the International School of Astro-fundamental Physics, Sept.  
1995. Proceedings edited by N. Sanchez and Zichichi, Physics, Sept. 1995.  
(Kluwer Publishers, Dordrecht, 1996) gr-qc/9511075
37. "GENERAL RELATIVITY AS GEOMETRO-HYDRODYNAMICS"  
Invited talk at the Second Sakharov International Conference Lebedev  
Physical Institute, May, 1996. Proceedings to appear (World Scientific,  
Singapore, 1997) gr-qc/9607070.
38. "NONEQUILIBRIUM PHASE TRANSITIONS IN THE EARLY UNIVERSE"  
Invited talk at the International Workshop on Nonequilibrium Phase  
Transitions July 1996, Santa Fe, New Mexico
39. "QUANTUM STATISTICAL FIELDS IN GRAVITATION AND  
COSMOLOGY"  
Invited Talk at the International Conference on Gravitation and Cosmology  
June 1997, Soo Chow University, Taiwan
40. "COHERENCE AND FLUCTUATIONS IN THE INTERACTION BETWEEN  
A MOVING ATOM AND A QUANTUM FIELD"  
B. L. Hu and Alpan Raval, Invited talk at the International Symposium on  
Macroscopic Quantum Coherence, Northeastern University, Boston, July  
1997 (World Scientific, Singapore, 1998) quant-ph/9710061.
41. "FINITE-SIZE COSMOLOGY"  
Invited Talk at the International Workshop on Topology and Cosmology,  
Case Western University, Cleveland, Oct. 1997

42. "BLACK HOLE FLUCTUATIONS AND BACKREACTION"  
B. L. Hu, Invited talk at the International Conference on quantum Gravity in the Southern Cone, Bariloche, Argentina, January 1998.
43. "STOCHASTIC GRAVITY"  
B. L. Hu, Invited talk at the Third Peyresq Meeting on Quantum Cosmology, Peyresq, France, June 1998.
44. "NON-EQUILIBRIUM DYNAMICS OF A THERMAL PLASMA IN A GRAVITATIONAL FIELD"  
Invited Talk at the International Workshop on Non-equilibrium Quantum Fields in Relativistic Heavy Ion Physics, Brookhaven National Laboratory, L. I., Oct. 1998.
45. "NONEQUILIBRIUM QUANTUM FIELDS IN BLACK HOLES AND THE EARLY UNIVERSE"  
Invited Talk at the International Workshop on Nonequilibrium Quantum Fields, Institute for Theoretical Physics, University of California, Santa Barbara, Jan 1999.
46. "RENORMALIZATION GROUP THEORY IN CURVED SPACETIMES AND COSMOLOGY: Scaling, Coarse-Graining and Backreaction"  
Invited Talk at the International Conference on Renormalization Group Theory –RG2000 Taxco, Mexico, Jan. 1999
47. "FLUCTUATIONS OF VACUUM ENERGY IN BLACK HOLE SPACETIMES" Invited Talk at the Fourth Peyresq Meeting on Quantum Cosmology, Peyresq, France, June 1999
48. "NOISE FROM QUANTUM FIELD THEORY" Invited talk at the Workshop on Quantum Field theory of Nonequilibrium Processes at the Institute for Nuclear Theory , University of Washington, Seattle. Nov. 1999
49. "FLUCTUATIONS OF VACUUM ENERGY AND VALIDITY OF SEMICLASSICAL GRAVITY"  
Invited Talk at the Fifth Peyresq Meeting on Quantum Cosmology Peyresq, France, June 2000
50. **Is there emitted radiation in Unruh effect?**  
B.L. Hu, Alpan Raval, Invited Talk at the Capri Workshop on Quantum Aspects of Beam Physics, Oct. 2000 . Proceedings edited by Pisin Chen.(World-Scientific, Singapore, 2001) quant-ph/0012134
51. **Beyond Unruh Effect: Nonequilibrium Quantum Dynamics of Moving Charges** B.L. Hu, Philip R. Johnson, Invited Talk at the Capri

- Workshop on Quantum Aspects of Beam Physics, Oct. 2000. Proceedings edited by Pisin Chen. (World-Scientific, Singapore, 2001) [quant-ph/0012132]
52. **“Worldline Influence Functional: Abraham-Lorentz-Dirac-Langevin Equation from QED”** Philip R. Johnson, B.L. Hu , in Proceedings of the Capri Workshop on Quantum Aspects of Beam Physics, Oct. 2000. Edited by Pisin Chen (World-Scientific, Singapore, 2001) [quant-ph/0012135]
53. **Recent Advances in Stochastic Gravity: Theory and Issues**  
B. L. Hu and E. Verdaguer , Invited Lectures at Erice School, May 2001, in *Advances in the Interplay between Quantum and Gravity Physics* edited by P. Bergmann and V. De Sabbata, (Kluwer, 2002) [gr-qc/0110092]
54. **“Vacuum Energy Fluctuations in Minkowski and Casimir Spaces”**  
Invited Talk at the Sixth Peyresq Meeting: Stochastic Gravity and Quantum Cosmology, Peyresq, France, June 2001
55. **“Decoherence in Two Level Systems and Brownian Motion”**  
Invited Talk at the Workshop Mechanisms for Decoherence-Theory and Applications to Nanotechnology and Quantum Information Science held at IC2, University of Texas, Austin October 2001. Proceedings published in *Chaos, Solitons and Fractals*, (2003)
56. **“Teacup Cosmology –Particle Creation and Structure Formation in the Early Universe from BEC Collapse ”** Invited Talk at the Seventh Peyresq Meeting, Peyresq, France, June 2002
57. **Quantum Noise and Fluctuations in Gravitation and Cosmology**  
B. L. Hu, Albert Roura, Sukanya Sinha, E. Verdaguer Invited Talk given by BLH at the *First International Symposium on Fluctuations and Noise* Sponsored by SPIE, 1-4 June 2003, Santa Fe, New Mexico. Paper number 5111-46. [gr-qc/0304057]
58. **What can we learn from BEC about Quantum Gravity?** Invited Talk at the Eighth Peyresq Meeting, Peyresq, France, June 2003
59. **Moving Charges, Detectors and Mirrors in a Quantum Field with Backreaction** Chad Galley, B. L. Hu and Philip R. Johnson in Proceedings of the Third International Symposium on Quantum Field Theory under the influence of External Conditions, Oklahoma City, Sept. 2003, edited by Kimball Milton (Rinton Press, 2004) [quant-ph/0402002]



60. **“Stochastic Theory of Relativistic Charges and Atoms in a Quantum Field”**, IARD conference, Saas Fee, Switzerland, June 2004. Proceedings published in *Foundations of Physics* (2005)
61. **“Black Hole Backreaction – difference between the Bekenstein Model and Stochastic Gravity Predictions”** Invited Talk at the Nineth Peyresq Meeting, Peyresq, France, June 2004
62. **“Black Hole Backreaction in the Moving Mirror Analog”**, with Chad Galley, Invited Talk at the Nineth Peyresq Meeting, Peyresq, France, June 2004
63. **“Stochastic Gravity: From Macro to Micro Structures of Spacetime”** invited talk at the DICE04 meeting, Piombino, Italy, September 2004
64. **“The Universe as an Ultimate Macroscopic Quantum Phenomenon”** invited talk at the *Quantum Physics of Nature* (QUPON) Conference, Vienna, Austria, May 2005.
65. **“Black hole fluctuations and dynamics from back-reaction of Hawking radiation: Current work and further studies based on stochastic gravity”** **B. L. Hu, Albert Roura**, Invited talk at the VII Asia-Pacific International Conference on Gravitation and Astrophysics – On the Occasion of the 90<sup>th</sup> anniversary of the publication of the Theory of General Relativity, National Central University, Taiwan. Nov. 2005 *Proceedings edited by J. M. Nester, C-M Chen and J-P Hsu (World Scientific Singapore, 2006) p. 236*
66. **Uniformly Accelerated Detectors in (3+1) D spacetime: From Vacuum Fluctuations to Radiation Flux.** S. Y. Lin and B. L. Hu, Invited talk delivered by S Y Lin at the VII Asia-Pacific International Conference on Gravitation and Astrophysics – On the Occasion of the 90<sup>th</sup> Year of General Relativity, National Central University, Taiwan. Nov. 2005 *Proceedings edited by J. M. Nester, C-M Chen and J-P Hsu (World Scientific Singapore, 2006) p.191*
67. **“Stochastic Gross-Pitaevsky Equation from Coarse-Grained Effective Action”**, in International Conference on **Nonlinear Science**, Hong Kong Baptist University May 24-26, 2006 Publication A119
68. **“Quantum Decoherence and Entanglement between two qubits in a common electromagnetic field”** in *Conference on Quantum Entanglement & Geometry*, Toruń University, Poland, June 4-7, 2006
69. **“Nonequilibrium Dynamics of cold atoms in an optical lattices”**.

Jagiellonian University, Krakow, Poland. June 12-13, 2006

70. **“Intrinsic and Fundamental Decoherence”**, 11<sup>th</sup> Peyresq Workshop on *“Macro and Micro Structures of Spacetime III”*, Peyresq, France, June 17-23, 2006 Publication A121
71. **“Exact Master Equation and Decoherence of Two Harmonic Oscillators Brownian Motion in a General Environment”**  
Workshop on *Quantum - Classical Transition and Quantum Information*, June 18-30, 2006 Benasque, Spain
72. **“Decoherence in Quantum Gravity: Issues and Critiques”**  
DICE2006 International Workshop: *Quantum Mechanics between Decoherence and Determinism*: new aspects from particle physics to cosmology Castello di Piombino (Tuscany) Italy, September 11-15, 2006. Publication A120

(5 yrs in between, details of invited talks omitted ... )

**100. Gravity and Thermodynamics: What do we really want?** ESF International Exploratory Workshop on “Gravity as Thermodynamics: Towards the microscopic origin of geometry” SISSA/ISAS, Trieste, Italy. Sept 5-8, 2011.

101. Vienna Nov 2011

102. HKUST Feb 2012, 103. Peking University (2 talks) March 2012

104. Lanzhou University (2 talks) May 2012

105. Brazilian Physical Society Plenary Talk, May 2012

106. kTlog 2, Cuena Spain, May 2012

107. Ginzburg Conference, Moscow, June 1, 2012

108. ITP, Beijing, June 4, 2012

109. Peyresq Meeting, *Fluctuation Theorem for Gravitating Systems*, France June 21, ‘12

110. Entanglement Decoherence & Quantum Control Workshop, Shanghai, June 12, 2012

-- Stopped enumerating.

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2014 Invited talk at DICE: *Quantum Information in the Face of Gravitation: What is the right theory to use?*

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### **C. Books or contributions to edited Books:**

#### Books Published

"DIRECTIONS IN GENERAL RELATIVITY" Volume 1-- Misner Festschrift  
edited by B. L. Hu, M. P. Ryan, and C. V. Vishveshwara (Cambridge University  
Press, Cambridge, 1993).

"DIRECTIONS IN GENERAL RELATIVITY" Volume 2-- Brill Festschrift  
edited by B. L. Hu and T. A. Jacobson (Cambridge University Press, Cambridge,  
1993).

"QUANTUM CLASSICAL CORRESPONDENCE"  
edited by D. H. Feng and B. L. Hu (International Press, Boston, 1997).

"NONEQUILIBRIUM QUANTUM FIELD THEORY"  
E. Calzetta and B. L. Hu (Cambridge University Press, Cambridge, 2008).

#### Books contracted:

"SEMICLASSICAL AND STOCHASTIC GRAVITY"  
B. L. Hu and E. Verdaguer (Cambridge University Press, Cambridge, 2018)

#### Invited Contributions (in addition to items in proceedings of conferences listed above)

1. "VACUUM VISCOSITY AND ENTROPY GENERATION IN QUANTUM  
GRAVITATIONAL PROCESSES IN THE EARLY UNIVERSE"  
in Advanced Series in Astrophysics, Vol. 1  
edited by L. Z. Fang and R. Ruffini (World Scientific, Singapore, 1983).
2. "MINISUPERSPACE AS A QUANTUM OPEN SYSTEM"  
B. L. Hu, J. P. Paz and S. Sinha in Misner Festschrift (1993) pp. 145-165.
3. "DECOHERENCE OF CORRELATION HISTORIES"  
E. Calzetta and B. L. Hu in Brill Festschrift (1993) pp. 38-65.
4. "FLUCTUATION, DISSIPATION AND IRREVERSIBILITY IN COSMOLOGY"  
in The Physical Origin of Time-Asymmetry,  
edited by J. J. Halliwell, J. Perez- Mercader and W. H. Zurek  
(Cambridge University, Cambridge, 1994). [gr-qc/9302021]
5. "NOTES ON BLACK HOLE FLUCTUATIONS AND BACKREACTION"  
B. L. Hu, A. Raval, and S. Sinha in "Black Holes, Gravitational Radiation  
and The Universe: Essays in honor of C. V. Vishveshwara", eds B. Iyer and  
B. Bhawal (Kluwer Academic Publishers, Dordrecht, 1998.) gr-qc/9901010

6. “Quantum Gravity and the Origin of the Universe – an Ephemeralist’s view” in *Why are we here? -- on the Origin of the Universe* (Book in Chinese) (Commercial Press, Hong Kong 2007)  
-- A collection of essays based on public talks given by Stephen Hawking, Bei-Lok Hu, Robert Laughlin, Henry Tye and others in Hong Kong, May-June 2006 [gr-qc/0611058]
7. New View on Quantum Gravity: Micro-Structure of Spacetime and Origin of the Universe (English version of 6) collected in PHYSICS OF SELF- ORGANIZATION SYSTEMS Proceedings of the 5th 21st Century COE Symposium held in Wasada University, Tokyo, Japan 13 - 14 September 2007, edited by Shin'ichi Ishiwata & Yasushi Matsunaga. (World Scientific Press 2008).
8. Invited Guest Editor, with Ting Yu, co-editor, for the Special Issue on Quantum Decoherence and Quantum Entanglement in *Quantum Information Processing* (December 2009)
9. 胡悲乐：“衍生引力 / 量子引力：宏观 / 微观时空理论” 《现代物理知识》杂志 纪念广义相对论创立 100 周年 专刊 第 27 卷第 5 期 (总 161 期) 第 55- 62 页。