PERSONAL INFORMATION

SURNAME: ANASTOPOULOS

NAME: CHARIS

PLACE OF RESIDENCE: PATRAS

e-mail: anastop@upatras.gr

TEL. 6973204667

CURRENT POSITION(S)

03.2021 – now	**Associate Professor** Department of Physics, University of Patras, Greece

PREVIOUS POSITION(S)

02.2016- 10.2021	**Assistant Professor** Department of Physics, University of Patras, Greece
01.2014 - 02.2016	**Lecturer** Department of Physics, University of Patras, Greece
06.2010 - 01.2014	**Elected Lecturer, tenured delayed due to budget constraints from Greek financial crisis** Department of Physics, University of Patras, Greece
10.2008 – 12. 2013	**Lecturer (non-tenured)** Department of Optics and Optometry, ATEI of Patras, Greece
01.2004 – 05.2010	**Postdoctoral Researcher** Department of Physics, University of Patras, Greece
05.2001 – 05.2003	**Postdoctoral Researcher** Spinoza Instituut, Utrecht University, the Netherlands
10.1998 – 04.2001	**Postdoctoral Researcher** Department of Physics, University of Maryland, USA
10.1997 – 09.1998	**Postdoctoral Researcher** Department of Physics, University of Barcelona, Spain
10.1996 – 09.1997	**Postdoctoral Researcher** Department of Physics, Imperial College, London, UK

EDUCATION

10.1993 - 09.1996	**Department of Physics, Imperial College, London, UK** Ph.D. Thesis title: Emergence of Classical Behaviour in Quantum Systems
10.1992 - 09.1993	**Department of Physics, Imperial College, London, UK** M.Sc. on Quantum Fields and Fundamental Forces
10.1988 – 06.1992	**Department of Physics, University of Patras, Greece** Ptyhio on Physics

PUBLICATIONS

a. Articles in journals

1. *Generalised Uncertainty Relations and Long Time Limits for Quantum Brownian Motion Models*, C. Anastopoulos and J. J. Halliwell, Phys. Rev. D51, 6870 (1995). DOI: 10.1103/PhysRevD.51.6870
2. *Decoherence and Classical Predictability of Phase Space Histories*, Phys. Rev. E53, 4711 (1996). DOI: 10.1103/PhysRevE.53.4711
3. *Quantum Theory of Nonrelativistic Particles Interacting with Gravity*, C. Anastopoulos, Phys. Rev. D54, 1600 (1996). DOI: 10.1103/physrevd.54.1600
4. *Coarse Grainings and Irreversibility in Quantum Field Theory*, C. Anastopoulos, Phys. Rev. D56, 1009 (1997). DOI: 10.1103/PhysRevD.56.1009
5. N - Particle Sector of Quantum Field Theory as a Quantum Open System, C. Anastopoulos, Phys. Rev. D56, 6702 (1997). DOI: 10.1103/PhysRevD.56.6702
6. *Selection of Preferred Consistent Sets*, C. Anastopoulos, Int. J. Theor. Phys. 37, 2261 (1998). DOI: 10.1023/A:1026658523246
7. *Non–Equilibrium Quantum Electrodynamics*, C. Anastopoulos and A. Zoupas, Phys. Rev. D58, 105006 (1998). DOI: 10.1103/physrevd.58.105006
8. *Information Measures and Classicality in Quantum Mechanics*, C. Anastopoulos, Phys. Rev. D59, 045001 (1999). DOI: 10.1103/PhysRevD.59.045001
9. *Two-level Atom-Field Interaction: Exact Master Equation for Non-Markovian Dynamics, Decoherence and Relaxation*, C. Anastopoulos and B. L. Hu, Phys. Rev. A62, 033821 (2000). DOI: 10.1103/PhysRevA.62.033821
10. *Quantum Fields in Non-Static Background: α Histories Perspective*, C. Anastopoulos, J. Math. Phys. 41, 617 (2000). DOI: 10.1063/1.533155
11. *History Quantisation of Parameterised Systems Development of a General Algorithm*, C. Anastopoulos and N. Savvidou, Class. Quant. Grav. 17, 2463 (2000). DOI: 10.1088/0264-9381/17/13/301
12. *Continuous-time Histories: Observables, Probabilities, Phase Space Structure and the Classical Limit*, C. Anastopoulos, J. Math. Phys. 42, 3225 (2001). DOI: 10.1063/1.1383975
13. *Quantum Mechanical Histories and the Berry Phase*, C. Anastopoulos and N. Savvidou, Int. J. Theor. Phys. 41, 529 (2002). DOI: 10.1023/A:1025706632036
14. *Quantum Theory without Hilbert Spaces*, C. Anastopoulos, Found. Phys. 31, 1545 (2001). DOI: 10.1023/A:1012690715414
15. *Quantum Correlation Functions and the Classical Limit*, C. Anastopoulos, Phys. Rev. D63, 125024 (2001). DOI: 10.1103/PhysRevD.63.125024
16. *Frequently Asked Questions about Decoherence*, C. Anastopoulos, Int. J. Theor. Phys. 41, 1573 (2002). DOI: 10.1023/A:1020144800650
17. *Quantum Processes on Phase Space,* C. Anastopoulos, Ann. Phys. 303, 273 (2003). DOI: 10.1016/S0003-4916(03)00006-X
18. *Role of Phase Space Geometry in Heisenberg Uncertainty Relations*, C. Anastopoulos and N. Savvidou, Ann. Phys. 308, 329 (2003). DOI: 10.1016/S0003-4916(03)00145-3
19. *Spin-Statistics Theorem and Geometric Quantization*, C. Anastopoulos, Int. J. Mod. Phys. A 19, 655 (2004). DOI: 10.1142/S0217751X04017860
20. *Coherent States of Spinning Relativistic Particles*, C. Anastopoulos, J. Phys. A: Math. Gen. 37, 8619 (2004). DOI: 10.1088/0305-4470/37/36/004
21. *On the Relation between Quantum Mechanical Probabilities and Event Frequencies*, C. Anastopoulos, Ann. Phys. 313, 368 (2004). DOI: 10.1016/j.aop.2004.05.002
22. *Non-Markovian qubit dynamics in a thermal field bath: Relaxation,* S. Shresta, C. Anastopoulos, A. Dragulescu and B. L. Hu, Phys. Rev. A 71, 022109 (2005). DOI: 10.1103/PhysRevA.71.022109
23. *History Minisuperspace Models*, C. Anastopoulos and N. Savvidou, Class. Quant. Grav. 22, 1841 (2005). DOI: 10.1088/0264-9381/22/9/023
24. *Classical Vs Quantum Probability in Sequential Measurements*, C. Anastopoulos, Found. Phys. 36, 1601 (2006). DOI: 10.1007/s10701-006-9077-5
25. *Time-of-Arrival Probabilities and Quantum Measurements*, C. Anastopoulos and N. Savvidou, J. Math. Phys. 47, 122106 (2006). DOI: 10.1063/1.2399085
26. *Quantum probabilities for time-extended Alternatives*, C. Anastopoulos and N. Savvidou, J. Math. Phys. 48, 032106 (2007). DOI: 10.1063/1.2713078

27. *Time-of-Arrival Probabilities and Quantum Measurements: II Application to tunnelling times,* C. Anastopoulos and N. Savvidou, J. Math. Phys. 49, 022101 (2008). DOI: 10.1063/1.2837428
28. *Intrinsic and Fundamental Decoherence: Issues and Problems*, C. Anastopoulos and B. L. Hu, Class. Quant.Grav. 25,154003 (2008). DOI: 10.1088/0264-9381/25/15/154003
29. *Time-of-Arrival Probabilities and Quantum Measurements: III Decay of unstable states,* C. Anastopoulos, J. Math. Phys. 49, 022103 (2008). DOI: 10.1063/1.2839920
30. *Gravitational Backreaction in Cosmological Spacetimes*, C. Anastopoulos, Phys. Rev. D79, 084029 (2009). DOI: 10.1103/PhysRevD.79.084029
31. *Non-Markovian Entanglement Dynamics of Two Qubits Interacting with a Common Electromagnetic Field*, C. Anastopoulos, S. Shresta and B.L. Hu, Q. Inf. Proc. 8, 549 (2009). DOI: 10.1007/s11128-009-0137-6
32. *The Rotating-Wave Approximation: Consistency and Applicability from an Open Quantum System Analysis*, C. H. Fleming, N. I. Cummings, C. Anastopoulos and B. L. Hu, J. Phys. A: Math. Theor. 43, 405304 (2010). DOI: 10.1088/1751-8113/43/40/405304
33. *Generalized uncertainty relations and entanglement dynamics in quantum Brownian motion models*, C. Anastopoulos, S. Kechribaris and D. Mylonas, Phys. Rev. A82, 042119 (2010). DOI: 10.1103/PhysRevA.82.042119
34. *Consistent Thermodynamics for Spin Echoes*, C. Anastopoulos and N. Savvidou, Phys. Rev. E83, 021118 (2011). DOI: 10.1103/physreve.83.021118
35. *Coherences of Accelerated Detectors and the Local Character of the Unruh Effect*, C. Anastopoulos and N. Savvidou, J. Math. Phys. 53, 012107 (2012). DOI: 10.1063/1.3679554
36. *Entropy of Singularities in Self-Gravitating Radiation*, C. Anastopoulos and N. Savvidou, Class. Quant. Grav. 29, 025004 (2012). DOI: 10.1088/0264-9381/29/2/025004
37. *Non-Markovian Dynamics and Entanglement of Two-Level Atoms in a Common Field*, C. Fleming, N. Cummings, C. Anastopoulos and B. L. Hu, J. Phys A: Math. Theor. 45, 065301 (2012). DOI: 10.1088/1751-8113/45/6/065301
38. *Time-of-Arrival Probabilities for General Particle Detectors*, C. Anastopoulos and N. Savvidou, Phys. Rev. A86, 012111 (2012). DOI: 10.1103/PhysRevA.86.012111
39. *A Master Equation for Gravitational Decoherence: Probing the Textures of Spacetime,* C. Anastopoulos and B. L. Hu, Class. Quant. Grav. 30, 165007 (2013). DOI: 10.1088/0264-9381/30/16/165007
40. *Quantum Temporal Probabilities in Tunneling Systems*, C. Anastopoulos and N. Savvidou, Ann. Phys. 336, 281 (2013). DOI: 10.1016/j.aop.2013.06.003
41. *Problems with the Newton-Schrodinger equation*, C. Anastopoulos and B. L. Hu, New J. Phys. 16, 085007 (2014). DOI: 10.1088/1367-2630/16/8/085007
42. *The thermodynamics of self-gravitating systems in equilibrium is holographic*, C. Anastopoulos and N. Savvidou, Class. Quant. Grav. 31, 055003 (2014). DOI: 10.1088/0264-9381/31/5/055003
43. *Real-time particle-detection probabilities in accelerated macroscopic detectors*, C. Anastopoulos and N. Savvidou, Gen. Rel. Grav. 47, 1842 (2015). DOI: 10.1007/s10714-014-1842-8
44. *Probing a Gravitational Cat State*, C. Anastopoulos and B. L. Hu, Class. Quant. Grav. 32, 165022 (2015). DOI: 10.1088/0264-9381/32/16/165022
45. *The thermodynamics of a black hole in equilibrium implies the breakdown of Einstein equations on a macroscopic near-horizon shell*, C. Anastopoulos and N. Savvidou, JHEP, 2016-144. DOI: 10.1007/jhep01(2016)144
46. *Non-Markovian time evolution of an accelerated qubit*, D. Moustos and C. Anastopoulos, Phys. Rev D95, 025020 (2017). DOI: 10.1103/physrevd.95.025020
47. *Time-of-Arrival Correlations*, C. Anastopoulos and N. Savvidou, Phys. Rev. A95, 032105 (2017). DOI: 10.1103/physreva.95.032105
48. *Path* of *a Tunneling Particle,* C. Anastopoulos and N. Savvidou, *Phys Rev.* A95, 052120 (2017). DOI: 10.1103/physreva.95.052120
49. *Equivalence Principle for Quantum Systems: Dephasing and Phase Shift of Free-Falling Particles*, C. Anastopoulos and B. L. Hu, Class. Quant. Grav. 35, 035011 (2018). DOI: 10.1088/1361-6382/aaa0e8
50. *Decays of Unstable Quantum States*, C. Anastopoulos, Int. J. Theor. Phys. 58, 890 (2019). DOI: 10.1007/s10773-018-3984-z
51. *Time of Arrival and Localization of Relativistic Particles*, C. Anastopoulos and N. Savvidou, J. Math. Phys. 60, 032301 (2019). DOI: 10.1063/1.5080930
52. *Multi-Time Measurements in Hawking Radiation: Information at Higher-Order Correlations,* C. Anastopoulos and N. Savvidou, Class. Quant. Grav. 37, 025015 (2020). DOI: 10.1088/1361-6382/ab5eb2
53. *How black holes store information in high-order correlations,* C. Anastopoulos and N. Savvidou, Int. J. Mod. Phys. D (2020), https://doi.org/10.1142/S0218271820430117
54. *Relativistic quantum thermodynamics of moving systems,* N. Papadatos and C. Anastopoulos, Phys. Rev. D 102, 085005 (2020). https://doi.org/10.1103/PhysRevD.102.085005

55. *Detectors interacting through quantum fields: Non-Markovian effects, non-perturbative generation of correlations and apparent non-causality.* T. Kolioni and C. Anastopoulos, Phys. Rev. A 102, 062207 (2020). https://doi.org/10.1103/PhysRevA.102.062207
56. *Quantum superposition of two gravitational cat states*, C. Anastopoulos and B. L. Hu, Class. Quant. Grav. **37** 235012 (2020) https://doi.org/10.1088/1361-6382/abbe6f
57. *Classification theorem and properties of singular solutions to the Tolman-Oppenheimer-Volkoff equation,* C. Anastopoulos and N. Savvidou, Class. Quant. Grav. (2021) https://doi.org/10.1088/1361-6382/abdf26
58. *Mind-Body Interaction in Modern Physics,* C. Anastopoulos, Found. Phys. 51, 1 (2021). https://doi.org/10.1007/s10701-021-00472-7
59. *Gravitational decoherence of photons*, M. Lagouvardos and C. Anastopoulos, Class. Quant. Grav. 38, 115012 (2021). https://doi.org/10.1088/1361-6382/abf2f3
60. *Thermodynamics and phase transitions of black holes in contact with a gravitating heat bath*, D. Kotopoulis and C. Anastopoulos, Class. Quant. Grav. 38, 195026 (2021). https://doi.org/10.1088/1361-6382/ac2137
61. *Gravitational effects in macroscopic quantum systems: a first-principles analysis,* C. Anastopoulos, M. Lagouvardos and N. Savvidou, Class. Quant. Grav. 38, 105512 (2021). https://doi.org/10.1088/1361-6382/ac0bf9
62. *Quantum Information in Relativity: The Challenge of QFT Measurements*, C. Anastopoulos and N. Savvidou, Entropy 24, 4 (2022). https://doi.org/10.3390/e24010004
63. *Gravity, Quantum Fields and Quantum Information: Problems with classical channel and stochastic theories,* C. Anastopoulos and B. L. Hu, Entropy 24, 490 (2022). https://doi.org/10.3390/e24040490

Conference proceedings

1. *Classical Limit of Quantum Field Theories*, C. Anastopoulos, Int. J. Theor. Phys. 38, 272 (1999). DOI: 10.1023/A:1026631409888
2. *Quantum Vs Stochastic Processes and the Role of Complex Numbers,* C. Anastopoulos, Int. J. Theor. Phys. 42, 1229 (2003). DOI: 10.1023/A:1025706632036
3. *On the Role of Complex Numbers in Quantum Theory*, C. Anastopoulos, Int. J. Theor. Phys. 45, 1483 (2006). DOI: 10.1007/s10773-006-9131-2
4. *Quantum Probabilities Vs Event Frequencies*, C. Anastopoulos, Braz. J. Phys. 35, 503 (2005).
5. *Decoherence in Quantum Gravity: Critique and Issues*, C. Anastopoulos and B. L. Hu, J. Phys.: Conf. Ser. 67, 012012 (2007). DOI: 10.1088/1742-6596/67/1/012012
6. *Probing a Gravitational Cat State: Experimental Possibilities*, M. Derakshani, C. Anastopoulos, and B. L. Hu, J. Phys: Conf. Ser. 701, 012015 (2016). DOI: 10.1088/1742-6596/701/1/012015
7. *Goals and feasibility of the deep space quantum link,* L. Mazzarella, M. Mohageg, D. V. Strekalov,et al, Quantum Communications and Quantum Imaging XIX, 11835, 72 (2021). https://doi.org/10.1117/12.2593986

Books

1. *Particle or Wave: The evolution of the concept of matter in modern physics*, C. Anastopoulos, Princeton University Press, 2008. ISBN: 9780691135120
2. *Quantum Theory, a Foundational Approach,* C. Anastopoulos, Cambridge University Press, 2023. (Accepted and in preparation).

INVITED PREENTATIONS IN CONFERENCES/WORKSHOPS . (Listing only events in the last 5 years.)

1. 3rd European Physical Society meeting on gravitation, May 2022, Nice, France.
2. 10th Annual International Conference on *Relativistic Quantum Information* (North), May 2019, Tainan, Taiwan.
3. 9th Annual International Conference on *Relativistic Quantum Information* (North), September 2018, Vienna, Austria.
4. Research seminar at UNAM on Quantum Foundations, November 2017, Mexico City, Mexico.
5. International Workshop on *Gravitational Decoherence,* July 2017, Bad Honnef, Germany.

.

SUPERVISION OF THESES AND POSTDOCTORAL FELLOWS

2014 - 2020 At University of Patras, Greece.

Supervised 40 completed undergraduate theses. Currently supervisor of 4 theses.

Supervised 18 completed M.Sc. theses. Currently supervisor of 4 M.Sc. theses.

Supervisor of 3 Ph.D. graduates at the University of Patras, Greece: Dimitris Moustos (2014-18), Theodora Kolioni (2015-19), Nikos Kollas (2015-20).

Currently supervising 6 Ph.D. candidates: Eirini Sourginou, Mihalis Lagouvardos, Dimitris Kotopoulis, Nikolaos Papadatos, Pelagia Zogogianni, Maria Papageorgiou, Konstantina Koliopoulou.

Supervisor of a junior post-doc in a Greek State Scholarship postdoctoral grant: Dimitris Moustos (2019-21)

TEACHING ACTIVITIES

2014 – 2020 Quantum Physics II (undergraduate core course), University of Patras.

2018 – 2020 Quantum Mechanics I (postgraduate core course), University of Patras.

2019 – 2020 Quantum Field Theory (postgraduate optional course), University of Patras.

2014 – 2020 Statistical Mechanics, (postgraduate optional course), University of Patras.

2006 – 2019 General Relativity (postgraduate optional course), University of Patras.

2015 – 2018 Modern Physics (undergraduate optional course), University of Patras.

2017 - 2018 Nuclear and Elementary Particle Physics (undergraduate optional course), University of Patras.

2014 – 2016 Advanced Quantum Theory (undergraduate optional course), University of Patras.

2012 – 2013 Applied Optics (undergraduate core course), ATEI of Patras.

2011 – 2013 Technology of Optical Instruments (undergraduate core course), ATEI of Patras.

2009 – 2011 Physics I (core course), ATEI of Patras.

2000 – 2001 Advanced General Relativity (postgraduate optional course), University of Maryland.

1999 – 2000 Special Topics on Quantum Theory (postgraduate optional course), University of Maryland.

CONFERENCE ORGANIZATION

2020 11th annual conference on Relativistic Quantum Information, Chania, Greece. (postponed due to the coronavirus)

2019 2nd International Conference on Gravitational Waves, Black Holes and Fundamental Physics, Athens, Greece.

2005 National Conference on Quantum Information and Probability, Patras.

FELLOWSHIPS, AWARDS, DISTINCTIONS

2022	NASA group achievement award for Science Definition team of DSQL mission.
2020	Scientific advisor to NASA's Deep Space Quantum Link (DSQL) mission.
2020	Honorable mention, Gravity Research Foundation 2020 Awards for Essays on Gravitation.
2013	Article Class. Quant. Grav. 30, 165007 (2013) was selected among the top of the year by editors.
2008	Article Class. Quant. Grav. 25, 154003 (2008) was selected among the top of the year by editors
2004	Young Researcher Prize, Empirikion Foundation, Greece.
2004 - 2005	Research Scholarship, Empirikion Foundation, Greece.
2000 - 2001	Postdoctoral Fellowship, Onassis Foundation, Greece.
1998 - 2000	Research Fellowship, National Science Foundation, USA.
1997 – 1998	Research Fellowship, Government of Catalonia, Spain.
1993 – 1996	Greek State Scholarship for doctorate studies. Greece.
1992 – 1993	Postgraduate Fellowship from Bodossakis Foundation, Greece.
1992	Xanthopoulos-Pnevmatikos prize, Physics Summer School, University of Crete, Greece.

RESEARCH GRANTS

Project Title	Funding source	Period	Role of the PI
Foundations of Relativistic Quantum Information	Julian Schwinger Foundation, USA	Feb. 2021- Jan. 2023	P.I., coauthor
The Influence of Gravity on Quantum Entanglement.	ESPA, Greek Ministry of Development	Jan. 2020 – Apr. 2021	P.I.
Conference on Relativistic Quantum Information 2020.	United States Air Force	Apr. 2020 – Dec. 2020	Coordinator, Proposal author
Quantum Information in Relativistic Systems	ELKE, University of Patras, Karatheodoris Research Grant	Jul. 2016 – Sep. 2019	P.I.
Quantum Probability, Geometry and Gravity	Marie Curie Reintegration Grant, European Commission	Jun. 2004 – Jul. 2006	Proposal author
Relation of quantum probability to phase space geometry	Marie Curie Individual Grant, European Commission	May 2001 – Apr. 2003	Proposal author