Curriculum Vitae

Dr. Elias Zafiris

Department of Mathematics
National and Kapodistrean University of Athens

PERSONAL INFORMATION

Date and place of birth: Athens, Greece, 2 May 1970
Nationality: Greek
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EDUCATION

1994-1998:	Imperial College, University of London, **Ph.D. in Theoretical Physics**. *Title*: "Covariant Brane Kinematics, Symmetries-Incorporated Field Equations and Decoherence Mechanisms in Spacetime". *Supervisor* : Prof. J. J. Halliwell
1993-1994:	Imperial College, University of London, **M.Sc. in "Quantum Fields and Fundamental Forces"** (with Distinction). *Dissertation*: "Fiber Bundle Structures and their Applications in Mathematical Physics".
1988-1993:	National and Kapodistrean University of Athens, **First Class Honours Degree in Physics** with Distinction (Ranked First in Graduation Class).

EMPLOYMENT RECORD

2010 - present:	**California State University Sacramento**, **Center for Philosophy and the Natural Sciences**, **USA**, Co-Investigator in the research project "Foundations of Relational Realism: Logical Causality, Intrinsic Decoherence, and a Category-Theoretic Mereotopological Model of Quantum Spacetime".
2004 - present:	**Department of Mathematics, National and Kapodistrean University of Athens, Greece**, Senior Research Fellow in the fields of Theoretical and Mathematical Physics and Teaching Professor.
April 2007 - July 2007:	**Department of Mathematics**, **University of Louvain, Belgium**, Visiting Senior Research Fellow on Category and Topos Theory.
2002 - 2004:	**Department of Mathematics and Informatics**, **University of Sofia, Bulgaria**, Postdoctoral Research Fellow in European Union Network (EDGE) for Research in Mathematics and Theoretical Physics.
2000 - 2002:	**Department of Mathematics**, **National and Kapodistrean University of Athens, Greece**, Associate Research Fellow in Mathematical Physics.
1998 - 2000:	**Imperial College, Department of Theoretical Physics, Univ. of London**, **U.K.**, Postdoctoral Research Fellow in Theoretical Physics and Teaching Professor.

SELECTED PUBLICATIONS

1. E. Zafiris and J. J. Halliwell, "Decoherent Histories Approach to the Arrival Time Problem", *Phys. Rev.* **D57** 3351 (1998).
2. E. Zafiris, "Incorporation of Spacetime Symmetries in Einstein's Field Equations", *J. Math. Phys*. **38**(11), 5854, (1997).
3. E. Zafiris, "Kinematical Approach to Brane Worldsheet Deformations in Spacetime", *Annals of Physics* **264**(1), 75 (1998).
4. E. Zafiris, "Irreducible Decomposition of Einstein's Equations in Spacetimes with Symmetries", *Annals of Physics* **263**(2), 155 (1998).
5. E. Zafiris, "Covariant Generalisation of Codazzi-Raychaudhuri and Area Change Equations for Relativistic Branes", *Journal of Geometry and Physics* **27**(3), 292 (1998).
6. E. Zafiris, "Generalised Raychaudhuri and Area Change Equations for Classical Brane Models in Space- time with Torsion", *Phys. Rev.* **D58**, 043509 (1998).
7. E. Zafiris, "On Quantum Event Structures. Part I: The Categorical Scheme", *Foundations of Physics Letters* **14**(2), (2001).
8. E. Zafiris, "On Quantum Event Structures. Part II: Interpretational Aspects", *Foundations of Physics Letters* **14**(2), (2001).
9. E. Zafiris, "Probing Quantum Structure Through Boolean Localization Systems", *International Journal of Theoretical Physics* **39**(12) (2001).
10. E. Zafiris, "Boolean Coverings of Quantum Observable Structure: A Setting for an Abstract Differential Geometric Mechanism", *Journal of Geometry and Physics* **50**, 99 (2004), math-ph/0306045.
11. E. Zafiris, "On Quantum Event Structures. Part III: Object of Truth Values", *Foundations of Physics Letters* **17**(5), (2004).
12. E. Zafiris, "Quantum Event Structures from the perspective of Grothendieck Topoi", *Foundations of Physics* **34**(7), (2004).
13. E. Zafiris, "Interpreting Observables in a Quantum World from the Categorial Standpoint", *International Journal of Theoretical Physics* **43**(1) (2004).
14. E. Zafiris, "Complex Systems from the perspective of Category Theory: I. Functioning of the Adjunction Concept", *Axiomathes* **15**(1) (2005).
15. E. Zafiris, "Complex Systems from the perspective of Category Theory: II. Covering Systems and Sheaves", *Axiomathes* **15**(2) (2005).
16. E. Zafiris, "Category-Theoretic Analysis of the Notion of Complementarity for Quantum Systems"*, International Journal of General Systems* **35**(1) (2006).
17. E. Zafiris, "Sheaf-Theoretic Representation of Quantum Measure Algebras", *Journal of Mathematical Physics* **47** 092103 (2006).
18. E. Zafiris, "Generalized Topological Covering Systems on Quantum Events Structures", *Journal of Physics A: Mathematical and General* **39** (2006).
19. E. Zafiris, "Topos-Theoretic Classification of Quantum Events Structures in terms of Boolean Reference Frames", *International Journal of Geometric Methods in Modern Physics* **3**(8) (2006).
20. E. Zafiris, "Quantum Observables Algebras and Abstract Differential Geometry: The Topos-Theoretic Dynamics of Diagrams of Commutative Algebraic Localizations", *International Journal of Theoretical Physics* **46**(2) (2007).
21. E. Zafiris, "A Sheaf-Theoretic Topos Model of the Physical Continuum and its Cohomological Observable Dynamics"*, International Journal of General Systems* **38**(1) (2009).
22. E. Zafiris, "Boolean Information Sieves: A Local-to-Global Approach to Quantum Information", *International Journal of General Systems* **39**(8) (2010).
23. E. Zafiris and A. Mallios, "The Homological Kahler-De Rham Differential Mechanism part I: Application in General Theory of Relativity", *Advances in Mathematical Physics*, doi:10.1155/2011/191083 (2011).
24. E. Zafiris and A. Mallios, "The Homological Kahler-De Rham Differential Mechanism part II: Sheaf-Theoretic Localization of Quantum Dynamics", *Advances in Mathematical Physics*, doi:10.1155/2011/189801 (2011).

ADDITIONAL INFORMATION

Selected Recent Citations

1. (2011) *Classical and Quantum Gravity*, 28 (14), art. no. 145009.
2. (2011) *International Journal of General Systems*, 40 (5), pp. 485-486.
3. (2010) *Physical Review A - Atomic, Molecular, and Optical Physics*, 82 (1), art. no. 012116.
4. (2009) *Physics Letters, Section A: General, Atomic and Solid State Physics*, 374 (2), pp. 154-157.
5. (2009) *Physical Review D - Particles, Fields, Gravitation and Cosmology*, 80 (12), art. no. 124032.
6. (2009) *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 465 (2101), pp. 71-86.
7. (2008) *Classical and Quantum Gravity*, 25 (20), art. no. 205008.
8. (2008) *Annals of Physics*, 323 (8), pp. 2044-2072.
9. (2008) *International Journal of Theoretical Physics*, 47 (6), pp. 1512-1532.
10. (2007) *Lecture Notes in Physics*, 734, pp. 163-193.

Awards
- Greek State Prizes in Mathematics and Physics (1988-1992).
- Boudouris Foundation, Greece, Scholarship in Physics (1992-1993).
- NATO Fellowship in Theoretical Physics (1993-1994).
- Honours Diploma of Imperial College, U.K., in Theoretical Physics (D.I.C.) (1993-1994).
- S. Onassis Foundation, Greece, Scholarship for Doctoral Research in Theoretical Physics (1994-1998).
- Imperial College, U.K., Postdoctoral Research Fellowship in Theoretical Physics (1998-2000).
- European Community Senior Postdoctoral Research Fellowship in the context of EDGE Research Network HPRN-CT-2000-00101, supported by the European Human Potential Programme (2002-2004).
- National and Kapodistrean University of Athens, Greece, Senior Research Fellowship in Theoretical and Mathematical Physics, I.K.Y. Greek State Research Fellowship Programme (2004-2005).
- University of Louvain, Belgium, Visiting Research Fellowship in Mathematical Category Theory and Applications, (April 2007- July 2007).

Recent Conference Papers
- E. Zafiris, "Logical Implication and the Internal Relation of the Local to the Global in Quantum Theory", invited paper presented at the Workshop of the Center for Philosophy and the Natural Sciences, Zurich, Switzerland, June 2011.
- E. Zafiris, "Category-Theoretic Encoding-Decoding Information in Complex Systems via Adjunctions", invited paper presented at the Workshop "Mathematics in the Science of Complex Systems" of the ASSYST Research Project in Complex Systems, European Center for Living Technology, Venice, Italy, February 2011.
- E. Zafiris, "An approach to Quantum Gravity via Sheaves", invited paper presented at the Workshop of the Center for Philosophy and the Natural Sciences, Orcas Islands, USA, July 2010.
- E. Zafiris, "Functorial Information Models of Quantum and Complex Natural Systems", invited paper presented at the Workshop of the Center for Philosophy and the Natural Sciences, Zurich, Switzerland, February 2010.
- E. Zafiris, "Advances in Complex Systems Science from a Category Theoretical Standpoint", invited paper for a plenary lecture delivered during the 5th IIGSS (International Institute for General Systems Studies) Conference, Wuhan, China, June 2007.