Curriculum Vitae

Dr. Ioannis Thanopulos

Work address: Department of Optics and Optometry,
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Education

2000: PhD in Natural Sciences, Department of Chemistry, Swiss Federal Institute of Technology, Zurich, Switzerland. Title of Thesis: *Quantum dynamics of the CH and NH chromophores in small molecules under coherent infrared multiphoton excitation.* Supervisor: Prof. Martin Quack.
1992: Diploma in Physics, Department of Physics, Swiss Federal Institute of Technology, Zurich, Switzerland.

Employment

05/2014 - present: Assistant Professor, Department of Optics and Optometry, Technological Educational Institute of Western Greece, Aigio, Greece.
10/2011 - 02/2013: Lecturer (seasonal), Department of Optics and Optometry, Technological Educational Institute of Western Greece, Aigio, Greece.
04/2008 - 09/2012: Research Associate, Theoretical and Physical Chemistry Institute, National Hellenic Research Foundation, Athens, Greece,
10/2005 - 03/2008: Researcher Associate, Department of Chemistry, University of British Columbia, Vancouver, Canada.
06/2004 - 09/2005: Postdoctoral Fellow in the group of Professor Moshe Shapiro, Department of Chemistry, University of British Columbia, Vancouver, Canada.
02/2001 - 11/2003: Postdoctoral Fellow in the group of Professor Moshe Shapiro, Department of Chemical Physics, Weizmann Institute of Science, Rehovot, Israel,
09/1994 - 09/2000: Research Assistant in the group of Professor Martin Quack, Department of Chemistry, Swiss Federal Institute of Technology, Zurich, Switzerland.

Research Interests - Publications

My research interests include: Time-dependent quantum dynamics in closed and open quantum systems, Photonics, Coherent light-matter interaction in multi-level quantum structures, with focus on coherent control in molecular and nanoscale systems, Energy transfer dynamics in quantum systems, Computational electrodynamics.
I have published 44 articles in international peer-reviewed journals and refereed conference proceedings (complete list of publications below).
h-index = 12 (January 15, 2017).

Awards - Research Grants

10/2008 - 09/2012: EU FP7 - People, Marie Curie International Reintegration Grant (10/08-09/12), PIRG03-GA-2008-230943, entitled *Control of photo-induced energy transfer (COPET).*
02/2001 - 11/2003: Postdoctoral Fellowship by the Swiss Friends of the Weizmann Institute.

International Conference and Symposia Organization

Co-organizator of the International Symposium *Quantum Control and Light-Matter Interactions: Recent Computational and Theoretical Results* of the International Conference of Computational Methods in Sciences and Engineering 2007 (ICCMSE 2007), Hotel Marbella, Corfu, Greece, September 25-28, 2007.

Editorial Responsibilities

1. Co-editor: Special Issue *Quantum Control of Matter and Light*, Journal of Modern Optics, (Taylor & Francis), 56 (Issue 6), 2009.
2. Co-editor: American Institute of Physics (AIP) Conference Proceedings 963 (Vol. 2B), 733-846, 2007.

Presentations

I have delivered 32 oral presentations (21 of which as invited speaker) in international and Greek conferences and academic seminars; I have also presented 18 poster in international and Greek conferences. In particular, in the last four years:

1. *STIRAP and coherent control: From optical control of chirality to light-driven molecular switches*, International Symposium: Stimulated Raman Adiabatic Passage in Physics, Chemistry, and Technology, Current status and future directions 25 years after the introduction of STIRAP, Technische Universitaet Kaiserslautern, September 22-25, 2015, Kaiserslautern, Germany - (invited speaker).

2. *Multi-dimensional quantum dynamics by partition technique*, Coherence and control in the quantum world: Current and future trends, Weizmann Institute of Science, December 15-18, 2014, Rehovot, Israel - (invited speaker).

3. *Effective modes differential equations method for quantum dynamics for large molecules*, Moshe Shapiro Memorial Symposium, University of British Columbia, August 13-15, 2014, Vancouver, BC, Canada - (invited speaker).

4. *Quantum dynamics by the effective modes differential equations method*, Center of Quantum Information and Quantum Control, Fields Institute, University of Toronto, August 8, 2014, Toronto, ON, Canada - (invited speaker).

5. *Quantum stochasticity on the S_2 electronic surface of pyrazine*, Gordon Research Conference, Quantum Control of Light and Matter, Mount Holyoke College, July 28 - August 2, 2013, South Hadley, MA, USA - (poster presentation).

6. *Time-dependent partitioning technique of the control of radiationless transitions in 24-mode pyrazine*, One-day Symposium on Quantum Dissipation and Control, Weizmann Institute of Science, July 11, 2012, Rehovot, Israel - (invited speaker).

List of Publications January 15, 2017

45. Non-Markovian dynamics in plasmon-induced spontaneous emission interference, I. Thanopulos, V. Yannopapas, and E. Paspalakis, *Phys. Rev. B*, accepted for publication (2017).

44. Multi-dimensional quantum dynamics by partition technique, I. Thanopulos, *Adv. Chem. Phys.* **159**, 349 (2016).

43. Interference effects on quantum light group velocity in cavity induced transparency, A. Eilam and I. Thanopulos, *J. Phys. B: At. Mol. Opt. Phys.* **48**, 194002 (2015).

42. Dynamics of submicron aerosol droplets in a robust optical trap formed by multiple Bessel beams, I. Thanopulos, D. Luckhaus, T. Preston, and R. Signorell, *J. Appl. Phys.* **115**, 154304 (2014).

41. Time-dependent partitioning theory of the control of radiationless transitions in 24-mode pyrazine, I. Thanopulos, X. Li, P. Brumer, and M. Shapiro, *J. Chem. Phys.* **137**, 064111 (2012).

40. Plasmon-induced enhancement of nonlinear optical rectification in organic materials, I. Thanopulos, E. Paspalakis, and V. Yannopapas, *Phys. Rev. B* **85**, 035111 (2012).

39. Outer-valence Green's function method using natural orbitals for ultrafast electron density dynamics, I. Thanopulos, *Comput. Theoret. Chem* **970**, 42 (2011).

38. Photodinduced charge transfer in heterofullerene-donor hybrids: A theoretical study, I. Thanopulos, I.D. Petsalakis, and G. Theodorakopoulos, *Chem. Phys. Lett.*, **506** 248 (2011).

37. Enhancement of ultraviolet photoinduced energy transfer near plasmonic nanostructures, I. Thanopulos, E. Paspalakis, and V. Yannopapas, *J. Phys. Chem. C* **115**, 4370 (2011).

36. Three dimensional photodissociation in strong laser fields: the memory-kernel effective-mode expansion, X. Li, I. Thanopulos, and M. Shapiro, *Phys. Rev. A* **83**, 033415 (2011).

35. Intramolecular energy transfer in 24-mode pyrazine by partitioning technique: A time-dependent perspective, I. Thanopulos, P. Brumer, and M. Shapiro, *J. Chem. Phys.* **133**, 154111 (2010).

34. Coherence Effects in Laser-Induced Continuum Structures, I. Thanopulos and M. Shapiro, *Adv. Quant. Chem.* **60**, 105 (2010).

33. Optical Control of Molecular Switches, I. Thanopulos, P. Král, M. Shapiro, and E. Paspalakis, *J. Mod. Opt.* **56**, 686 (2009).

32. Preface: Special Issue on Quantum Control of Matter and Light, E. Paspalakis and I. Thanopulos, *J. Mod. Opt.* **56**, 685 (2009).

31. Coarse Grained Open System Quantum Dynamics, I. Thanopulos, P. Brumer, and M. Shapiro, *J. Chem. Phys.* **129**, 194104 (2008).

30. Optical switching of electric charge transfer pathways in porphyrin: A light-controlled nanoscale current router, I. Thanopulos, E. Paspalakis, and V. Yannopapas, *Nanotechnology* **19**, 445202 (2008).

29. Laser-catalyzed production of ultracold molecules: The ^{6}Li + ^{6}Li$-^7$Li $\xrightarrow{\hbar\omega}$ ^{6}Li$-^6$Li+ ^{7}Li reaction, X. Li, G.A. Parker, P. Brumer, I. Thanopulos, and M. Shapiro, *Phys. Rev. Lett.* **101**, 043003 (2008).

28. Theory of laser enhancement and suppression of cold reactions: The fermion-boson ^{6}Li + ^{7}Li$_2$ $\xleftrightarrow{\hbar\omega}$ ^{6}Li ^{7}Li + ^{7}Li radiative collision, X. Li, G.A. Parker, P. Brumer, I. Thanopulos, and M. Shapiro, *J. Chem. Phys.* **128**, 124314 (2008).

27. Strong system-bath interactions and the control of the photodissociation of CH_3I, I. Thanopulos and M. Shapiro, *J. Phys. B: At. Mol. Opt. Phys.* **41**, 074010 (2008).

26. Preface: Quantum Control and Light-Matter Interactions: Recent Computational and Theoretical Results, E. Paspalakis and I. Thanopulos, *AIP Conf. Proc.* **963**, 733 (2007).

25. Laser-Induced Dynamical Chirality and Intramolecular Energy Flow in the CH Chromophore, I. Thanopulos, *AIP Conf. Proc.* **963**, 541 (2007).

24. Laser-Operated Porphyrin-Based Molecular Current Router. I. Thanopulos, and E. Paspalakis, *Phys. Rev. B* **76**, 035317 (2007).

23. Coherently Controlled Adiabatic Passage. P. Král, I. Thanopulos, and M. Shapiro, *Rev. Mod. Phys.* **79**, 53 (2007).

22. Docking of Chiral Molecules on Twisted and Helical Nanotubes: Nanomechanical Control of Catalysis. B. Wang, P. Král, and I. Thanopulos, *Nano Lett.* **6**, 1918 (2006).

21. Enhanced Selectivity and Yield in Multi-Channel Photodissociation Reactions: Application to CH_3I. I. Thanopulos and M. Shapiro, *J. Chem. Phys.* **125**, 133314 (2006).

20. Coherently Controlled Adiabatic Passage to Multiple Continuum Channels. I. Thanopulos and M. Shapiro, *Phys. Rev. A* **74** 031401(R) (2006).

19. Detection and Automatic Repair of Nucleotide Base-Pair Mutations by Coherent Light. I. Thanopulos and M. Shapiro, *J. Am. Chem. Soc.* **127**, 14434 (2005).

18. Quantum-field Coherent Control: Preparation of Broken Symmetry Entangled States. P. Král, I. Thanopulos, and M. Shapiro, *Phys. Rev. A* **72**, 020303(R) (2005.

17. Switching Nucleotide Base Pairs by Coherent Light. I. Thanopulos and M. Shapiro, *Lecture Series on Computer and Computational Sciences* **4**, 744 (2005).

16. Bands of Image States in Nanowires Lattices and Infrared-Control of Proteins on Nanotube Ropes. P. Král, D. Segal, M. Shapiro, I. Thanopulos, B.E. Graninger, and H.R. Sadeghpour, *Fullerenes, Nanotubes, and Carbon Nanostructures* **13**, 267 (2005).

15. Laser-driven coherent manipulation of molecular chirality. I. Thanopulos, E. Paspalakis, and Z. Kis, *Chem. Phys. Lett.* **390**, 228 (2004).

14. Theory of the Two Step Enantiomeric Purification of 1,3 Dimethylallene. D. Gerbasi, P. Brumer, I. Thanopulos, P. Král, and M. Shapiro, *J. Chem. Phys.* **120**, 11557 (2004).

13. Complete Control of Population Transfer between Clusters of Degenerate States. I. Thanopulos, P. Král, and M. Shapiro, *Phys. Rev. Lett.* **92**, 113003 (2004).

12. A global electric dipole function of ammonia and isotopomers in the electronic ground state. R. Marquardt, M. Quack, I. Thanopulos, and D. Luckhaus, *J. Chem. Phys.* **119**, 10724 (2003).

11. Tubular Image States and Light-Driven Molecular Switches, P. Král, B. Graninger, H.R. Sadeghpour, I. Thanopulos, M. Shapiro, and D. Cohen, *AIP Conf. Proc.* **685**, 465 (2003).

10. Theory of a two-step enantiomeric purification of racemic mixtures by optical means: the D_2S_2 molecule. I. Thanopulos, P. Král, and M. Shapiro, *J. Chem. Phys.* **119**, 5105 (2003).

9. Two-Step Enantio-selective Optical Switch. P. Král, I. Thanopulos, M. Shapiro, and D. Cohen, *Phys. Rev. Lett.* **90**, 033001 (2003); *Nature Materials*: www.nature.com/materials/news/ 030206/portal/m030206-2.html.

8. Tunneling Dynamics of the NH Chromophore in NHD_2 During and After Coherent Infrared Excitation. R. Marquardt, M. Quack, I. Thanopulos, and D. Luckhaus, *J. Chem. Phys.* **118**, 643 (2003).

7. Slowing Down of Light by Laser Induced Barrier Hopping. I. Thanopulos and M. Shapiro, *J. Chem. Phys.* **117**, 8404 (2002).

6. Some Simple Mechanisms of Multiphoton Excitation in Many Level Systems. E.A. Donley, R. Marquardt, M. Quack, J. Stohner, I. Thanopulos and E.U. Wallenborn, *Mol. Phys.* **99**, 1275 (2001).

5. Quantum dynamics of the CH and NH chromophores in small molecules under coherent infrared multiphoton excitation. I. Thanopulos, Dissertation ETH-Zurich Nr. 13837 (2000).

4. Dynamical Chirality and the Quantum Dynamics of Bending Vibrations of the CH Chromophore in Methane Isotopomers. R. Marquardt, M. Quack and I. Thanopulos, *J. Phys. Chem A* **104**, 6129 (2000).

3. R. Marquardt, M. Quack and I. Thanopulos, *Proceedings of the Annual Meeting of the New Swiss Chemical Society, Zürich 1998*, *Chimia* **52**, 485 (1998).

2. E.A. Donley, R. Marquardt, M. Quack, J. Stohner, I. Thanopulos and E.U. Wallenborn, *Chimia*, **51** 524 (1997).

1. Absolute Integrated Band Strength and Magnetic Dipole Transition Moments in the $^2P_{3/2} \rightarrow {}^2P_{1/2}$ Fine Structure (with Hyperfine Structure) Transition of the Iodine Atom: Experiment and Theory. T.K. Ha, Y. He, J. Pochert, M. Quack, R. Ranz, G. Seyfang and I. Thanopoulos, *Ber. Bunsenges. Phys. Chem.* **99**, 384 (1995).