

Carlos A. Trallero

CONTACT INFORMATION	Department of Physics & University of Connecticut 2152 Hillside Road, Unit 3046 Storrs, CT 06269-3046 U.S.A.	<i>Voice:</i> +1 (860) 486 4915 <i>Mobile:</i> +1 (785) 323-7911 <i>Fax:</i> +1 (860) 486 3346 <i>E-mail:</i> carlos.trallero@uconn.edu
EDUCATION	Stony Brook University, Stony Brook, New York, USA Ph.D. in Physics 2007 <ul style="list-style-type: none">• Dissertation topic: “Strong Field Coherent Control.”• Advisor: Thomas C. Weinacht. M.A. in Physics, August 2004	2002 - 2007
	Higher Institute for Nuclear Sciences and Technology, Havana, Cuba M.Sc. in Nuclear Physics, July 2001 <ul style="list-style-type: none">• Dissertation topic: “Quantum chaos in a cylindrical quantum lens.”• Advisor: Carlos L. Trallero-Giner. Licentiate degree in Nuclear Physics, July 1998 <ul style="list-style-type: none">• Dissertation topic: “Percolation models for nuclear fragmentation.”• Advisor: Fernando Guzman• Graduated with honors	1993 - 1998
HONORS AND AWARDS	Stony Brook University, Stony Brook, New York, USA Lee Wilcox Prize for Best Experimental Thesis.	2007
	International Centre for Theoretical Physics, Trieste, Italy Accepted as Young Collaborator, Summer 2000 and 2001.	2000 - 2001
	Higher Institute for Nuclear Sciences and Technology, Havana, Cuba Several awards in “Undergraduates Research Forum”, 1994-1997 Golden Graduate Diploma, 1998 Best Junior Research, 1998	1993 - 1998
PROFESSIONAL EXPERIENCE	Associate Professor Department of Physics, University of Connecticut, Storrs, CT, U.S.A.	2017 - present
	Associate Professor Physics Department, Kansas State University, Manhattan, U.S.A.	2016 - 2017
	Assistant Professor Physics Department, Kansas State University, Manhattan, U.S.A.	2010 - 2016
	Postdoctoral Fellow Advisor: Paul Corkum, Steacie Institute for Molecular Sciences, National Research Council Canada, Ottawa, Canada.	2007 - 2010
	Graduate Student Research Assistant Stony Brook University, Stony Brook, New York, USA.	2004 - 2007

Junior Professor

1998 - 2001

Higher Institute for Nuclear Sciences and Technology, Havana, Cuba

FUNDING

Current

- Nebraska-Kansas NSF EPSCoR Track 2, co-PI: \$ 3,000,000
- James R. Macdonald Laboratory DOE grant: Structure and Dynamics of Atoms, Ions, Molecules and Surfaces. Department of Energy, senior-personnel: \$ 10,000,000
- DOE: Probing Electron-Molecule Scattering with HHG: Theory and Experiment, PI: \$ 77,500 per year
- AFOSR: Recollision physics at the nanoscale, PI: \$1,053,696 (starts 2017)
- NSF Graduate Research Scholarship, awarded to Derrek Wilson, advisor
- DoD Graduate Research Scholarship, awarded to Adam Summers, advisor

Past

- NSF-Major Research Instrumentation: Acquisition of a High Intensity Tunable Femtosecond Laser. National Science Foundation, PI: \$ 992,927
- Defense University Research Instrumentation Program (DURIP): Intense, few-cycle infrared pulses for attosecond and ultrafast science, PI: \$198,000
- DARPA-PULSE: Lightwave driven nano plasmonic circuits, PI

Pending

- NSF: Fundamental Study of Femtosecond Laser-Matter Interaction in Bulk Silicon Initiated by Multiphoton Ionization
- ONR: Generation of intense, carrier-envelope-phase-stable few-cycle pulses in the long-wavelength-infrared

SELECTED
PUBLICATIONS

1. "An intense, few-cycle source in the long-wavelength infrared: Strong field physics in the semi-classical regime", Derrek J. Wilson, Adam M. Summers, Stefan Zigo, Brandin Davis, Seyyed-Javad Robotjazi, Jeff Powell, Artem Rudenko, Carlos A. Trallero-Herrero, (to be submitted), (2017)
2. "A self referencing attosecond interferometer", Jan Troß, Georgios Kollipolous, Carlos Trallero, (to be submitted), (2017)
3. "Spatial characterization of Bessel-like beams for strong-field physics", Adam M. Summers, Xiaoming Yu, Xinya Wang, Maxime Raoul, Josh Nelson, Daniel Todd, Stefan Zigo, Shuting Lei, And Carlos A. Trallero-Herrero, *Optics Express*, **25**, 1646, (2017)
4. "Ionization Study of Isomeric Molecules in Strong-field Laser Pulses", Stefan Zigo, Anh-Thu Le, Pratap Timilsina, Carlos A. Trallero-Herrero, *Scientific Reports*, **7**, 42149, (2017)
5. "Internal modification of intrinsic and doped silicon using infrared nanosecond laser", Xiaoming Yu, Xinya Wang, Margaux Chanal, Carlos A. Trallero-Herrero, David Grojo, and Shuting Lei, *Applied Physics A*, **122**, 1001, (2016)
6. "High order harmonic generation from SF₆: Deconvolution of macroscopic effects", B.P. Wilson, K.D. Fulfer, S. Mondal, X. Ren, J. Tross, E.D. Poliakoff, J. Jose, Anh-Thu Le, R. R. Lucchese, C. Trallero-Herrero, *Journal of Chemical Physics*, **145**, 224305 (2016)
7. "The N₂ HOMO-1 orbital cross-section revealed through high harmonic generation", Jan Troß, Xiaoming Ren, Varun Makhija, Sudipta Mondal, Vinod Kumarappan, Carlos A. Trallero-Herrero, *Physical Review A*, (available online), (2017)
8. "An Atomic Photoionization Experiment by Harmonic Generation Spectroscopy", M. V. Frolov, T. S. Sarantseva, N. L. Manakov, K. D. Fulfer, B. D. Wilson, J. Troß, X. Ren, E. D. Poliakoff, A. A. Silaev, N. V. Vvedenskii, A. F. Starace and C. A. Trallero-Herrero, *Physical Review A: Rapid Communications*, **93**, 031403(R), (2016)
9. "Materials processing with superposed Bessel beams", Xiaoming Yu, Carlos A. Trallero-Herrero and Shuting Lei, *Applied Surface Science*, **360**, 833, (2015)
10. "A 260 MW light source at 7 μ m center wavelength as a path to strong field science in the far infrared", Derrek J. Wilson, Adam M. Summers and Carlos A. Trallero-Herrero", *Frontiers in Optics*, FTh4A, (2015)
11. "Long term carrier-envelope-phase stabilization of a terawatt-class Ti:Sapphire laser", Adam M. Summers, Benjamin Langdon, Jon Garlick, Xiaoming Ren, Derrek Wilson, Stefan Zigo, Matthias Kling, Shuting Lei, Christopher Elles, Eric Wells, Erwin Poliakoff, Kevin Carnes, Vinod Kumarappan, Itzik Ben-Itzhak and Carlos Trallero-Herrero, *Frontiers in Optics*, FTu3F.2, (2015)

12. “A carrier-envelope-phase stabilized terawatt class laser at 1 kHz with a wavelength tunable option”, Benjamin Langdon, Jonathan Garlick, Xiaoming Ren, Derrek J. Wilson, Adam M. Summers, Stefan Zigo, Matthias F. Kling, Shuting Lei, Christopher G. Elles, Eric Wells, Erwin D. Poliakoff, Kevin D. Carnes, Vinod Kumarappan, Itzik Ben-Itzhak and Carlos A. Trallero-Herrero, *Optics Express*, **23** 4563 (2015)
13. “Strong field processes inside gallium arsenide”, Sarah M. Golin, Sean Kirkwood, Denis D. Klug, Paul B. Corkum, and Carlos A. Trallero-Herrero, *Journal of Physics B: Atomic, Molecular and Optical Physics*, **47**, 204025, (2014)
14. “Simultaneous broadening of the depleted pump and signal from an optical parametric amplifier”, D. Wilson, X. Ren, C. Trallero-Herrero, *CLEO*, STh4E.5, (2014)
15. “Intense Few-Cycle Infrared Laser Pulses at the Advanced Laser Light Source”, B. E. Schmidt, A. D. Shiner, M. Giguère, C. Trallero-Herrero, P. Lassonde, N. Thiré, D. M. Villeneuve, J-C. Kieffer, P. B. Corkum, and F. Légaré, *Chinese Journal of Physics (Invited article)*, **52**, 537, (2014)
16. “Optical damage threshold of Au nanowires in strong femtosecond laser fields”, A.M. Summers, A.S. Ramm, Govind Paneru, M.F. Kling, B.N. Flanders and C.A. Trallero-Herrero, *Optics Express*, **22**, 4235, (2014)
17. “Measuring angle-dependent photoionization cross section from aligned nitrogen using high harmonic generation”, Xiaoming Ren, Varun Makhija, Anh-Thu Le, Jan Tross, Sudipta Mondal, Cheng Jin, Vinod Kumarappan, and Carlos Trallero-Herrero, *Physical Review A*, **88**, 043421, (2013)
18. “High harmonic cutoff energy scaling and laser intensity measurement with a 1.8 μm laser source”, A.D. Shiner, C. A. Trallero-Herrero, N. Kajumba, B.E. Schmidt, J.B. Bertrand, K. T. Kim, H.-C. Bandulet, D. Comtois, J.-C. Kieffer, D.M. Rayner, P.B. Corkum, F. Légaré and D.M. Villeneuve, *Journal of Modern Optics*, **60**, 1458, (2013)
19. “Generation of broad XUV continuous high harmonic spectra and isolated attosecond pulses with intense mid-infrared lasers”, C. Trallero-Herrero, C. Jin, B. Schmidt, A. Shiner, D. M. Villeneuve, P. B. Corkum, C. D. Lin, F. Légaré, A. -T. Le, *Journal of Physics B: Atomic, Molecular and Optical Physics, Fast Track*, **45**, 011001, (2012)
20. “Observation of Cooper Minimum in Krypton Using High Harmonic Spectroscopy”, A. D. Shiner, B. E. Schmidt, C. Trallero-Herrero, P. B. Corkum, J.-C. Kieffer, F. Légaré, and D. M. Villeneuve, *Journal of Physics B: Atomic, Molecular and Optical Physics*, **45**, 074010, (2012)
21. “High harmonic generation with long wavelength few-cycle laser pulses”, B. E. Schmidt, A. D. Shiner, M. Giguère, P. Lassonde, C. A. Trallero-Herrero, J.-C. Kieffer, P. B. Corkum, D. M. Villeneuve, F. Légaré, *Journal of Physics B: Atomic, Molecular and Optical Physics*, **45**, 074008, (2012)
22. “Generation of isolated attosecond pulses in the far field by spatial filtering with an intense few-cycle mid-infrared laser”, C. Jin, A.-T. Le, C. A. Trallero-Herrero, and C. D. Lin, *Physical Review A*, **84**, 043411, (2011)
23. “Probing collective multi-electron dynamics with high harmonic spectroscopy: The giant resonance in xenon”, A. D. Shiner, B. E. Schmidt, C. Trallero-Herrero, H. J. Worner, S. Patchkovskii, P. B. Corkum, J.-C. Kieffer, F. Légaré and D. M. Villeneuve, *Nature Physics*, **7**, 464, (2011)
24. “Intense 1.8 μm two-cycle pulse compression with bulk material”, B. E. Schmidt, C. Trallero-Herrero, A. D. Shiner, P. Lassonde, É. Bisson, J.-C. Kieffer, P. B. Corkum, D. M. Villeneuve and F. Légaré, *Applied Physics Letters*, **96** 121109, (2010)
25. “Direct Test of Laser Tunneling with Electron Momentum Imaging”, L. Arissian, C. Smeenk, F. Turner, C. Trallero-Herrero, A. V. Sokolov, D. M. Villeneuve, A. Staudte, and P. B. Corkum, *Physical Review Letters*, **105**, 133002, (2010)
26. “High harmonic generation in ethylene with infrared pulses”, C. Trallero-Herrero, B. E. Schmidt, A. D. Shiner, P. Lassonde, É. Bisson, J.-C. Kieffer, P. B. Corkum, D. M. Villeneuve and F. Légaré, *Chemical Physics*, **366**, 33, (2009)

27. “Wavelength Scaling of High Harmonic Generation Efficiency”, A. D. Shiner, C. Trallero-Herrero, N. Kajumba, H.-C. Bandulet, D. Comtois, F. Légar’e, J.-C. Kieffer, P. B. Corkum, and D. M. Villeneuve, *Physical Review Letters*, **103** 07390 (2009)
28. “High harmonic generation with a spatially-filtered optical parametric amplifier”, H.-C. Bandulet, D. Comtois, A. Shiner, C. Trallero-Herrero, N. Kajumba, T. Ozaki, P. B. Corkum, D. M. Villeneuve, J.-C. Kieffer and F. Legar’e, *Journal of Physics B: Atomic, Molecular and Optical Physics*, **41**, 245602, (2008)
29. “Strong Field Multiphoton Inversion of a Three-Level System using Shaped Ultrafast Laser Pulses”, Steve D. Clow, Carlos Trallero-Herrero, Thomas Bergeman and Thomas Weinacht, *Physical Review Letters* **100**, 233603, (2008)
30. “Interpreting ultrafast molecular fragmentation dynamics with *ab initio* structure calculations”, Carlos Trallero-Herrero, Brett J. Pearson, Thomas Weinacht, Kandis Gilliard, and Spiridoula Matsika, *Journal of Chemical Physics* **128**, 124107, (2008)
31. “Strong Field Coherent Control of Atomic Population Transfer”, Carlos Trallero-Herrero, Steve D. Clow, Thomas Bergeman and Thomas Weinacht, *Journal of Physics B: Atomic, Molecular and Optical Physics*, **41**, 074014, (2008)
32. “Transition from Weak to Strong Field Coherent Control”, Carlos Trallero-Herrero and Thomas Weinacht, *Physical Review A*, **75**, 063401, (2007)
33. “Understanding Strong Field Coherent Control: Single Atom vs Collective Dynamics”, Carlos Trallero-Herrero, Michael Spanner, and Thomas Weinacht, *Physical Review A: Rapid Communications*, **74**, 051403, (2006)
34. “Bose-Einstein condensates: Analytical methods for the Gross-Pitaevskii equation”, Carlos Trallero-Giner, J. Drake, V. Lopez-Richard, C. Trallero-Herrero and Joseph L. Birman, *Physics Letters A*, **354**, 115, (2006)
35. “Strong Field Atomic Phase Matching”, C. Trallero-Herrero, J. L. Cohen and T. C. Weinacht, *Physical Review Letters*, **96**, 063603, (2006)
36. “Gross-Pitaevskii equation: Variational approach”, J. C. Drake Perez, C. Trallero-Giner, V. Lopez Richard, C. Trallero-Herrero, Joseph L. Birman, *physica status solidi (c)*, **2**, 3665, (2005)
37. “Transformations to Diagonal Bases in Closed Loop Learning Control Experiments”, D. Cardoza, F. Langhojer, C. Trallero-Herrero, H. Rabitz and T. C. Weinacht, *Journal of Chemical Physics*, **122**, 124306, (2005)
38. “Coherent Control of Strong Field Multiphoton Absorption in the Presence of Dynamic Stark Shifts”, C. Trallero-Herrero, D. Cardoza, J. L. Cohen and T. C. Weinacht, *Physical Review A*, **71**, 013423, (2005)
39. “Changing Pulse Shape Basis for Molecular Learning Control”, D. Cardoza, F. Langhojer, C. Trallero-Herrero, O. L. A. Monti and T. C. Weinacht, *Physical Review A*, **70**, 053406, (2004)
40. “Electronic states in a cylindrical quantum lens: Quantum chaos for decreasing system symmetry”, C. Trallero-Herrero, C. Trallero-Giner, S. E. Ulloa, and R. Perez-Alvarez, *Physical Review E*, **64**, 056237, (2001)
41. “1D Transfer Matrices”, R. Perez Alvarez, C. Trallero-Herrero and F. García Moliner, *European Journal of Physics*, **4**, 275, (2001)

CURRENT ACTIVE
COLLABORATORS

- Robert Lucchese, Chemistry Department, Texas A&M
- Erwin Poliakoff, Chemistry Department, Louisiana State University
- Anthony Starace, Physics Department, University of Nebraska-Lincoln
- Yonfeng Lu, Electrical and Computer Engineering, University of Nebraska-Lincoln
- Yunshen Zhou, Electrical and Computer Engineering, University of Nebraska-Lincoln
- Mikhail Frolov, Voronezh State University, Voronezh, Russia
- Nicolai Manakov, Voronezh State University, Voronezh, Russia
- James Edgar, Department of Chemical Engineering, Kansas State University
- Shuting Lei, Department of Industrial and Manufacturing Systems Engineering, Kansas State University

- Brett Flanders, Physics Department, Kansas State University
- Christopher Sorensen, Physics Department, Kansas State University
- Benjamin Langdon, CrunchTech, Inc.

OTHER INTERESTS Enjoy biking, squash, swimming, audiophile equipment, and BBQ