

CURRICULUM VITAE

Dr. Shimshon Kallush

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Education

B.Sc. 1996 - 1998 Ben Gurion University, Beer - Sheva.

M.Sc. 1999 - 2000 Ben Gurion University, Beer – Sheva, with Rectors' and Knesset Awards for M.Sc. students.

Ph.D 2001 – 2005 Ben Gurion University of the Negev, with Rectors' and Knesset Awards for Ph.D. students

Research Interests:

- Interaction of light & matter, analytical and simulations of dynamics of atoms & molecules in external fields.
- (Quantum) Control of atomic & molecular systems.
- Methods of dynamical simulations.
- Electronic structure of molecules.
- Nonlinear optics, chromophores, multi-photon processes.

Academic Employment

2012-present Senior Lecturer, ORT Braude Academic College, Karmiel.

2010–2012 Lecturer, ORT Braude Academic College, Karmiel.

2009-2010 Adjunct Teacher, Lecturer, Technion

2009 – Researcher, Hebrew University, Jerusalem, Israel with Prof. Ronnie Kosloff

2005-2008 – Post-doctoral research assistant, in the Hebrew University, Jerusalem, Israel with Prof. Ronnie Kosloff

1-7/2006 - Visiting post-doctoral at Laboratoire Aime Cotton, Orsay, France; host: Prof. Françoise Masnou-Seeuws

9/2005 & 9/2006 – Visiting post-doctoral researcher at the University of Connecticut; host: Prof. Robin Cote and Phil Gould.

2004 – Visiting student at ITAMP, Harvard University, and at the University of Connecticut.

Industrial Engineering Experience

2008 – Mempile inc. – researcher.

Awards

2006-8 Lady-Davis Fellowship for Post-docs.

2005 The Israeli parliament prize (Kneset) for Ph.D. students.

2004 Israeli Chemical Society prize for Ph.D. students.

2004 Krietman prize for the university's best graduate student (rector's prize).

2000 The Israeli parliament prize (Kneset) for M.Sc. students.

2000-2004 Krietman fellowship for Ph.D.

2000 Rector's prize for M.Sc.

List of Publications

Refereed papers:

1. S. Kallush and Y.B. Band, *Short-pulse chirped adiabatic population transfer in diatomic molecules*, Physical Review A **61** R41401 (2000) (Rapid Communication).
2. S. Kallush, B. Segev, A. Sergeev and E.J. Heller, *Surface Jumping: Frank-Condon Factor and Condon Points in Phase Space*, Journal of Physical Chemistry A **106**(25), 6006 (2002).
3. Y.B. Band, S. Kallush, and Roi Baer, *Rotational Aspects of short-pulse population transfer in diatomic molecules*, Chemical Physics Letters, **392**, 23 (2004).
4. S. Kallush, M. Tennenbaum and B. Segev, *Local group velocity and path-delay: Semiclassical propagators for the time evolution of Wigner functions in deep tunneling and in dispersive media*, Chemical Physics Letters, **396**, 261 (2004).
5. S. Kallush, B. Segev, and R. Côté, *Evanescence-wave mirror for ultracold diatomic polar molecules*, Physical Review Letters, **95**, 163005 (2005).
6. S. Kallush, B. Segev, and R. Côté, *Manipulating atoms and molecules with evanescent-wave mirrors*, European Journal of Physics D, **35**, 3 (2005).
7. N. Zamstein, S. Kallush, and B. Segev, *A phase-space approach to the $T_1 \rightarrow S_0$ radiationless decay in benzene: the effect of deuteration*, Journal of Chemical Physics, **123**, 074304 (2005)
8. S. Kallush and Ronnie Kosloff, *The Quantum Governor: Automatic quantum control and reduction of the influence of noise without measuring*, Physical Review A **73**, 032324 (2006).
9. S. Kallush and Ronnie Kosloff, *Alternative Methods for Mapped Grids: Complex Scaling for Highly Excited Vibrational States of Diatomic Molecules*, Chemical Physics Letters, **433** 221 (2006).
10. S. Kallush, R. Kosloff and F. Masnou-Seeuws, *Grid methods for cold molecules : determination of photoassociation lineshapes and rate constants*, Physical Review A **75** 043404 (2007)
11. M. J. Wright, J. A. Pechkis, J. L. Carini, S. Kallush, R. Kosloff, and P. L. Gould *Coherent control of ultracold collisions with chirped light: Direction matters*

- Physical Review A **75** 051401(R)(2007).
12. S. Kallush and R. Kosloff, *Momentum Control in Photoassociation of Ultra-Cold Atoms*, Physical Review A **76** 053408 (2007)
 13. S. Kallush and R. Kosloff, *Unitary photoassociation: One-step production of ground state bound molecules*, Physical Review A **77** 023421 (2008)
 14. A. Wand, S. Kallush, O. Shoshanim, O. Bismuth, R. Kosloff and S. Ruhman, *Chirp effects on impulsive vibrational spectroscopy: a multimode perspective*, Physical Chemistry Chemical Physics, 2010 (DOI: 10.1039/b920356g)
 15. J. A. Pechkis, J. L. Carini, C. E. Rogers III, P. L. Gould, S. Kallush and R. Kosloff, *Coherent control of ultracold ⁸⁵Rb trap-loss collisions with nonlinearly frequency-chirped light*, Physical Review A **83**, 063403 (2011)
 16. S. Kallush and R. Kosloff, *Scaling the robustness of the solutions for quantum controllable problems*, Physical Review A **83** 063412 (2011)
 17. J. L. Carini, J. A. Pechkis, C. E. Rogers III, P. L. Gould, S. Kallush and R. Kosloff, *Quantum Simulations of Ultracold Collisions Induced by Nonlinearly Chirped Light*, Physical Review A **85**, 013424 (2012)
 18. S. Kallush and R. Kosloff, *On the Relations of Quantum Control and Quantum Chaos*, Physical Review A **86**, 013420 (2012)

Conference proceedings:

1. Bilha Segev, E.J. Heller, Y. Japha, S. Kallush, and A. Sergeev, *A phase-space approach to atomic collisions in multidimensional complex systems*, in ed. C R Vane, Photonic, Electronic and Atomic Collisions (XXII ICPEAC) Proceedings, (Rinton Press, Paramus, 2002).