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Curriculum Vitae and List of Publications
Prof. Avi Pe'er

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Education

From-To	Institute	Area of Specialty	Degree
2005-2008	JILA, University of Colorado	Precision measurement and Ultrafast frequency combs	Post-doctoral research
2000-2005	Weizmann Institute of Science	Quantum optics – sources and applications of broadband bi-photons	PhD
1997-1999	Weizmann Institute of Science	Linear optics and holography - optical processing with white incoherent light	MSc
1993-1996	Tel Aviv University	Physics and Computer Science	BSc

Positions

From-To	Institute	Research Area	Title
2013 –	Bar Ilan University	Physics	Associate Professor (with tenure)
2008 – 2013	Bar Ilan University	Physics	Assistant Professor (tenure track)

Publications

A. Refereed Articles:

1. Idan Parshani, Leon Bello, Mallachi-Elia Meller and Avi Pe'er, "Kerr-Lens Mode-Locking: Numerical Simulation of the Spatio-Temporal Dynamics on All Time Scales", *Appl. Sci.* **12**, 10354 (2022)
2. Idan Parshani, Leon Bello, Mallachi-Elia Meller and Avi Pe'er, "Passive symmetry breaking of the space-time propagation in cavity dissipative solitons", *Scientific Reports* **12**, 14874 (2022)
3. Leon Bello, Yoad Michael, Michael Rosenbluh, Eliahu Cohen and Avi Pe'er, "Broadband complex two-mode quadratures for quantum optics", *Optics Express* **29**, 41282 (2021)
4. Nir Nechushtan, Hanzhong Zhang, Mallachi Meller and Avi Pe'er, "Optimal detection of ultra-broadband bi-photons with quantum nonlinear SU(1,1) interference", *New J. Phys.* **23**, 113003 (2021)
5. Yoad Michael, Isaac Jonas, Leon Bello, Mallachi-Elia Meller, Eliahu Cohen, Michael Rosenbluh, and Avi Pe'er, "Augmenting the Sensing Performance of Entangled Photon Pairs through Asymmetry", *Phys. Rev. Lett.* **127**, 173603 (2021)
6. Marcello Calvanese Strinati, Leon Bello, Emanuele G. Dalla Torre, and Avi Pe'er, "Can Nonlinear Parametric Oscillators Solve Random Ising Models?", *Phys. Rev. Lett.* **126**, 143901 (2021)
7. Idan Parshani, Leon Bello, Mallachi Meller and Avi Pe'er, "Diffractive saturable loss mechanism in Kerr-lens mode-locked lasers: direct observation and simulation", *Optics Letters* **46**, 1530-1533 (2021)

8. Xuan Zhu, Chun-Hung Chang, Carlos González-Arciniegas, Avi Pe'er, Jacob Higgins, and Olivier Pfister, "Hypercubic cluster states in the phase-modulated quantum optical frequency comb", *Optica* **8**, 281 (2021)
9. Leon Bello, Marcello Calvanese Strinati, Shai Ben-Ami, and Avi Pe'er, "Pairwise Mode Locking in Dynamically Coupled Parametric Oscillators", *Phys. Rev. Lett.* **126**, 083601 (2021)
10. Marcello C. Strinati, Igal Aharonovich, Shai Ben-Ami, Emanuele G. Dalla Torre, Leon Bello and Avi Pe'er, "Coherent dynamics in frustrated coupled parametric oscillators", *New J. Phys.* **22**, 085005 (2020).
11. Yoad Michael, Leon Bello, Michael Rosenbluh and Avi Pe'er, "Squeezing-enhanced Raman Spectroscopy", *npj – Quantum Information* **5**, 81 (2019)
12. Marcello Calvanese Strinati, Leon Bello, Avi Pe'er, and Emanuele G. Dalla Torre, "Theory of coupled parametric oscillators beyond coupled Ising spins", *Phys. Rev. A* **100**, 023835 (2019)
13. Leon Bello, Marcello Calvanese Strinati, Emanuele G. Dalla Torre, and Avi Pe'er, "Persistent Coherent Beating in Coupled Parametric Oscillators", *Phys. Rev. Lett.* **123**, 083901 (2019)
14. Yaakov Shaked, Yoad Michael, Rafi Vered, Leon Bello, Michael Rosenbluh and Avi Pe'er, "Lifting the Bandwidth limit of Optical Homodyne Measurement with Broadband Parametric Amplification", *Nat. Commun.*, **9**, 609 (2018)
15. Mallachi Meller, Shai Yefet and Avi Pe'er, "Mode-Locking With Ultra-Low Intra-Cavity Pulse Intensity Using Enhanced Kerr Nonlinearity", *IEEE J. Quantum Electron.* **53**, 1300105 (2017).
16. David Goldovsky, Valery Jouravsky, and Avi Pe'er, "Simple and robust phase-locking of optical cavities with > 200 KHz servo-bandwidth using a piezo-actuated mirror mounted in soft materials", *Optics Express* **24**, 028239 (2016).
17. Igal Aharonovich and Avi Pe'er, "Coherent Amplification of Ultrafast Molecular Dynamics in an Optical Oscillator", *Phys. Rev. Lett.* **116**, 073603 (2016).
18. **Selected for PRL Editors' Suggestion:** Rafi Z. Vered, Yaakov Shaked, Yelena Ben-Or, Michael Rosenbluh and Avi Pe'er, "Classical-to-quantum Transition with Broadband Four-Wave Mixing", *Phys. Rev. Lett.* **114**, 063902 (2015).
19. Yaakov Shaked, Shai Yefet, Tzahi Geller and Avi Pe'er, "Octave-spanning spectral phase control for single-cycle bi-photons", *New J. Phys.* **17**, 073024 (2015).
20. Yaakov Shaked, Roey Pomerantz, Rafi Z. Vered and Avi Pe'er, "Observing the nonclassical nature of ultra-broadband bi-photons at ultrafast speed", *New J. Phys.* **16**, 053012 (2014).
21. Shai Yefet and Avi Pe'er, "A Review of Cavity Design for Kerr Lens Mode-Locked Solid-State Lasers", *Appl. Sci.* **3**, 694-724 (2013)
22. Faina Shikerman and Avi Pe'er, "Sum-frequency generation as a detector of high-power two-mode squeezing", *Phys. Rev. A* **88**, 043808 (2013)
23. Shai Yefet and Avi Pe'er, "Mode locking with enhanced nonlinearity - a detailed study", *Opt. Express* **21**, 19040–19046 (2013)
24. Shai Yefet, Valery Jouravsky and Avi Pe'er, "Kerr-lens Mode Locking Without Nonlinear Astigmatism", *J. Opt. Soc. Am. B* **30**, 549–551 (2013)
25. Rafi Vered, Michael Rosenbluh and Avi Pe'er, "Two-Photon Correlation of Amplified Spontaneous Four Wave Mixing", *Phys. Rev. A* **86**, 043837 (2012)
26. Shai Yefet, Na'aman Amer, and Avi Pe'er, "Intra-cavity gain shaping of mode-locked Ti:Sapphire laser oscillations", *Opt. Express* **20**, 9991-9998 (2012)
27. Y. Stern, O. Klinger, T. Schneider, K. Jamshidi, A. Pe'er and A. Zadok, "Low-distortion long variable delay of linear frequency modulated waveforms," *IEEE Photonics* **4**, 499-503 (2012)
28. Faina Shikerman, Avi Pe'er and Larry P. Horwitz, "Semigroup evolution in the Wigner-Weisskopf pole approximation with Markovian spectral coupling", *Phys. Rev. A* **84**, 012122 (2011).
29. Silke Ospelkaus, Avi Pe'er, Kang Kuen Ni, Josh J. Zirbel, Brian Neyenhuis, Svetlana Kotochigova, Paul S. Julienne, Jun Ye, Deborah S. Jin, "Efficient state transfer in an ultracold dense gas of heteronuclear molecules", *Nature Physics* **4**, 622 - 6 (2008)

30. Kang Kuen Ni, Silke Ospelkaus, Marcio H. G. de Miranda, Avi Pe'er, Brian Neyenhuis, Josh J. Zirbel, Svetlana Kotochigova, Paul S. Julienne, Deborah S. Jin and Jun Ye, "A High Phase-Space-Density Gas of Polar Molecules in the Rovibrational Ground State", *Science* **322**, 231-5 (2008)
31. Evgeny A. Shapiro, Avi Pe'er, Jun Ye and Moshe Shapiro, "Piecewise adiabatic population transfer in a molecule via a wave packet", *Phys. Rev. Lett.* **101**, 023601 (2008)
32. Matthew C. Stowe, Avi Pe'er and Jun Ye, "Control of Four-Level Quantum Coherence via Discrete Spectral Shaping of an Optical Frequency Comb", *Phys. Rev. Lett.* **100**, 203001 (2008)
33. Avi Pe'er, Evgeny A. Shapiro, Matthew C. Stowe, Moshe Shapiro and Jun Ye, "Precision control of molecular dynamics with an ultrafast frequency comb", *Phys. Rev. Lett.* **98**, 113004 (2007)
34. Avi Pe'er, Yaron Bromberg, Barak Dayan, Yaron Silberberg and Asher A. Friesem, "Broadband sum-frequency generation as an efficient two-photon detector for optical tomography", *Opt. Express* **15**, 8760-9 (2007)
35. Evgeny A. Shapiro, Moshe Shapiro, Avi Pe'er and Jun Ye, "Photoassociation adiabatic passage of ultracold Rb atoms to form ultracold Rb₂ molecules", *Phys. Rev. A*, **75**, 013405 (2007)
36. Avi Pe'er, Yaron Silberberg, Barak Dayan, Asher A. Friesem, "Design of a high-power continuous source of broadband down-converted light", *Phys. Rev. A* **74**, 053805 (2006)
37. Nirit Dudovich, Thomas Polack, Avi Pe'er and Yaron Silberberg, "Simple route to strong field coherent control", *Phys. Rev. Lett* **94**, 083002 (2005)
38. Avi Pe'er, Barak Dayan, Asher A. Friesem and Yaron Silberberg, "Temporal shaping of entangled photons", *Phys. Rev. Lett.* **94**, 073601 (2005)
39. Barak Dayan, Avi Pe'er, Asher A Friesem and Yaron Silberberg, "Nonlinear interactions with an ultrahigh flux of broadband entangled photons", *Phys. Rev. Lett.* **94**, 043602 (2005)
40. Avi Pe'er, Barak Dayan, Marija Vucelja, Yaron Silberberg and Asher A. Friesem, "Quantum lithography by coherent control of classical light pulses", *Opt. Express* **12**, 6600-6 (2004)
41. Avi Pe'er, Barak Dayan, Yaron Silberberg and Asher A Friesem, "Optical code-division multiple access using broadband parametrically generated light", *J. Lightwave Technol.* **22**, 1463-71 (2004)
42. Barak Dayan, Avi Pe'er, Asher A Friesem and Yaron Silberberg, "Two photon absorption and coherent control with broadband down-converted light", *Phys. Rev. Lett.* **93**, 023005 (2004)
43. Barak Dayan, Avi Pe'er, Asher A Friesem and Yaron Silberberg "Coherent control with broadband squeezed vacuum", [arXiv:quant-ph/302038](https://arxiv.org/abs/quant-ph/302038) Feb (2003)
44. Adolf W. Lohmann, Avi Pe'er, Dayong Wang, Asher A Friesem, "Flatland optics. III. Achromatic diffraction", *J. OSA A* **18**, 2095-7 (2001)
45. Adolf W. Lohmann, Dayong Wang, Avi Pe'er, Asher A. Friesem. "Flatland optics. II. Basic experiments", *J. OSA A* **18**, 1056-61 (2001)
46. Avi Pe'er, Dayong Wang, Adolf W. Lohmann, Asher A. Friesem, "Wigner formulation of optical processing with light of arbitrary coherence", *Appl. Opt.* **40**, 249-56 (2001)
47. Dayong Wang, Avi Pe'er, Adolf W. Lohmann, Asher A. Friesem, "Wigner algebra as a tool for the design of achromatic optical processing systems", *Opt. Eng.* **39**, 3014-24 (2001)
48. Adolf W. Lohmann, Avi Pe'er, Dayong Wang, Asher A. Friesem, "Flatland optics: fundamentals", *J. OSA A* **17**, 1755-62 (2000)
49. Dayong Wang, Avi Pe'er, Asher A. Friesem, Adolf W. Lohmann, "General linear optical coordinate transformations", *J. OSA A* **17**, 1864-9 (2000)
50. Avi Pe'er, Dayong Wang, Adolf W. Lohmann, Asher A. Friesem, "Achromatic optical correlation", *Opt. Lett.* **25**, 776-8 (2000)
51. Avi Pe'er, Dayong Wang, Adolf W. Lohmann, Asher A. Friesem, "Optical correlation with totally incoherent light", *Opt. Lett.* **24**, 1469-71 (1999)

B. Patents:

1. Avi Pe'er, Barak Dayan, Yaron Silberberg and Asher A. Friesem, "Method and System for Use in Optical Code Division Multiple Access (OCDMA)", US patent no. 7339717 (2003).

C. Chapters in Books:

1. Mathew C. Stowe, Michael J. Thorpe, Avi Pe'er, Jun Ye, Jason E. Stalnaker, Vladislav Gerginov, and Scott A. Diddams, "Direct Frequency Comb Spectroscopy", in [*Advances in Atomic, Molecular and Optical Physics*, 55, page 1-60 \(Elsevier, Amsterdam 2008\)](#)