Alex Hayat

CURRENT POSITION

Assistant Professor, Department of Electrical Engineering, Technion, Haifa, Israel 2014-present

EDUCATION

Ph.D., Electrical Engineering – Technion, Haifa, Israel 2007 - 2010
Thesis: “Applications of multi-photon processes for semiconductor quantum photonics"
Demonstrated two-photon emission and two-photon gain in semiconductors, and developed the corresponding theory

M.Sc., *(summa cum laude)*, Electrical Engineering - Technion, Haifa, Israel 2005 - 2007
Introduced the standing-wave nonlinear optics theoretically and experimentally.

B.Sc., *(cum laude)*, Electrical Engineering – Technion, Haifa, Israel 1999 – 2003

PROFESSIONAL EXPERIENCE

Global Scholar at the Canadian Institute for Advanced Research – University of Toronto 2013-2014

Banting Postdoctoral Fellow – University of Toronto, Physics Department 2011-2013
Demonstrated high-temperature superconducting proximity effect in topological insulators, superconducting tunnel diodes and ultrafast dynamics in exciton-polariton condensates.

Graduate Researcher and Teaching Assistant - Technion, EE, Haifa, Israel 2004-2010

Design Engineer - Intel, Processors Department – Haifa, Israel 2000-2005

AWARDS

Alon Fellowship – Israel Council for Higher Education	2014
Horev Fellow, Leaders in Science and Technology – Taub Foundation	2014
Canadian Institute for Advanced Research - Global Academy Fellowship	2013
John C. Polanyi Prize in Physics	2012
European Physical Society PhD Thesis Prize	2011
Natural Sciences and Engineering Research Council of Canada Howard Alper Prize	2011
Banting Postdoctoral Fellowship	2011
Andrew and Erna Finci Viterbi Prize	2011
Rothschild Fellowship (declined)	2011
Centre for Quantum Information and Quantum Control Fellowship (declined)	2011
Russell Berrie Nanotechnology Prize	2010
Russell Berrie Scholarship	2009
Jacobs Outstanding Publication Award	2009
Israel Academy of Sciences - Adams Fellowship	2009
International Union of Pure and Applied Physics Young Author Award	2008
Daniel Graduate Fellowship	2008
Hershel Rich Innovation Award	2008
Louis D. Smullin Award for Teaching Excellence	2007
Applied Materials Excellence Award	2007
Intel Prize	2007
Technion Excellence Award for Graduate Students	2005

Intel Employee Award	2005
American Technion Society Scholarship	2002

PESREARCH GRANTS

German-Israeli Foundation – *Polariton condensate dynamics for ultrafast devices and circuits* - $35,000 (2015)

Canadian Institute for Advanced Research - *Novel states of matter for quantum technologies* - $58,000 (2014)

European commission FP7 CIG - *Quantum-device engineering with novel states of matter* - $120,000 (2014)

Taub Foundation – *Horev Fellowship*- $10,000 (2014)

Israel Council for Higher Education – *Alon Fellowship*- $43,000 (2014)

Russell Berrie Nanotechnology Institute - *Technion-TU Berlin Projects on Green Photonics* - $20,000 (2014)

Joint Waterloo/Technion Cooperation Program - $30,000 (2015)

PUBLICATIONS

43 papers in peer-reviewed journals, including *Nature Photonics, Nano Letters, Physical Review X, Nature Communications*, *Optica*, 10 papers in *Physical Review Letters*, and an invited review paper.

22 invited talks, 3 issued patents, 101 conference papers and 4 popular science articles (publication list enclosed).

PESREARCH INTERESTS

The goal of my current research is to employ novel states of matter for the development of new devices for quantum technologies, ultrafast nanoelectronics, solar energy and imaging.

MILITARY SERVICE

Active service in Israel Defense Forces, Rank: staff sergeant. 1995-1998

Position: optics and electronics technician of navigation systems and border indication systems.

TEACHING EXPERIENCE

University of Toronto, Canada

Physics at the Cutting Edge Modular Course	2013

Technion, Haifa, Israel

Introduction to Solid State Physics Course	2008-2015
Advanced Topics 2	2014-2015
Supervising 8 undergraduate projects in the Micro-Photonics Lab	2006-2010
Supervising a graduate project in the Micro-Photonics Lab	2009
Introduction to Electrical Engineering Course	2005-2010
Semiconductor Lasers and Integrated Photonic Devices Course	2005-2008
Advanced wireless communication Lab	2005
Electrical Engineering Lab	2005

PROFESSIONAL ACTIVITIES

Manuscript Reviewer for Physical Review Letters (APS), Physical Review A (APS), Physical Review X (APS), Nature Sci. Rep. (NPG), Optica (OSA), Opt. Express (OSA), Opt. Letters (OSA), New Journal of Physics (IOP), App. Phys. Lett. (AIP),

Research Proposal Reviewer for Bennett Grant (OSA), CQIQC Scholarship, Israel Ministry of Science and Technology grants.

Editorial Board Member of Nature Scientific Reports (NPG)

Chair of Sessions for various international conferences including: IEEE Photonics Conference, SPIE Photonics West Conference, Quantum Coherence and Control Conference, International Workshop on Nanophotonics

Organizer of EU 7th Framework Program (FP7) project preparation (2008)

Member of APS and OSA

PUBLICATION LIST

Refereed Journals

1. E. Shumakher, A. Hayat, A .Freimain, M. Nazarathy, G. Eisenstein, "Timing Extraction of a 10-gb/s NRZ Signal Using an Electro-Optic Multiplication Scheme", ***IEEE Photon. Technol. Lett.***, 16, 2353 (2004).
2. A. Hayat, M. Orenstein, "Photon-Number State On-Demand Source by Cavity Parametric Down Conversion", ***Appl. Phys. Lett***., 89, 171108 (2006).
3. P. Ginzburg, A. Hayat, M. Orenstein, "Nonlinear optics with local phasematching by quantum based meta-material", ***J. Opt. A: Pure Appl. Opt.*** 9 S350 (2007).
4. A. Hayat, P. Ginzburg, M. Orenstein, "High-rate entanglement source via two-photon emission from semiconductor quantum wells", ***Phys. Rev. B***, 76, 035339 (2007).
   * Selected for Virtual Journal of Nanoscale Science & Technology 16, Issue 7 (2007);
   * Selected for Virtual Journal of Quantum Information, 7, 8 (2007).
5. A. Hayat and M. Orenstein, "Standing-wave nonlinear optics in an integrated semiconductor microcavity," ***Opt. Lett***. 32, 2864 (2007).
6. A. Hayat, M. Orenstein, "Photon conversion processes in dispersive microcavities: Quantum-field model", ***Phys. Rev. A***, 77, 013830 (2007).
   * Selected for Virtual Journal of Quantum Information, 8, 2 (2008).
7. A. Hayat, P. Ginzburg, M. Orenstein, "Observation of Two-Photon Emission from Semiconductors", ***Nature Photon***. 2, 238 (2008).
   *Highlighted in Nature Photonics News&Views and an Interview
   *Reported in Physics World
8. A. Hayat, P. Ginzburg, M. Orenstein, „ Infrared single-photon detection by two-photon absorption in silicon ", ***Phys. Rev. B*** 77, 125219 (2008).
9. A. Hayat, P. Ginzburg, D. Neiman, S. Rosenblum, and M. Orenstein, "Hyperentanglement source by intersubband two-photon emission from semiconductor quantum wells," ***Opt. Lett.*** 33, 1168 (2008).
   * Selected for Virtual Journal of Nanoscale Science & Technology 18, Issue 4 (2008);
   * Selected for Virtual Journal of Quantum Information, 8, 8 (2008).
10. A. Hayat, E. Small, Y. Elor, M. Orenstein, "Phasematching in Semiconductor Nonlinear Optics by Linear Long-Period Gratings", ***Appl. Phys. Lett***., 92, 181110 (2008).
11. N. Kaminski, A. Hayat, P. Ginzburg and M. Orenstein, "Numerical study of Few-Cycle Pulses by Nonlinear Compression in Two-Photon Semiconductor Amplifiers", ***IEEE Photon. Technol. Lett***., 21, 173 (2009).

12. A. Hayat, N. Berkovitch and M. Orenstein, "Enhanced Resolution and High Aspect-Ratio Semiconductor Nanopatterning by Metal Overcoating", ***Appl. Phys. Lett***., 94, 063103 (2009).
    * Selected for Virtual Journal of Nanoscale Science & Technology 19, Issue 8 (2009);
13. P. Ginzburg, A. Hayat, V. Vishnyakov, M. Orenstein, "Photonic logic by linear unidirectional interference", ***Opt. Express***, 17, 4251 (2009).
14. A. Hayat, A. Nevet, M. Orenstein, " Electrically induced two-photon transparency in semiconductor quantum wells", ***Phys. Rev. Lett***., 102, 183002 (2009).
    * Selected for Virtual Journal of Ultrafast Science, August Issue (2009).
15. A. Hayat, P. Ginzburg and M. Orenstein "Measurement and model of the infrared two-photon emission spectrum of GaAs", ***Phys. Rev. Lett.,*** 103, 023601 (2009).
    *Selected for Virtual Journal of Ultrafast Science, 8, 8 (2009).
16. A. Hayat, P. Ginzburg, M. Orenstein, "Photon energy entanglement characterization by electronic transition interference ", ***Opt. Express***, 17, 21280 (2009).
    *Selected for Virtual Journal of Quantum Information, 10, 1 (2010).
17. A. Hayat, A. Nevet, M. Orenstein, "Ultrafast partial measurement of fourth-order coherence by HBT interferometery of upconversion-based autocorrelation", ***Opt. Lett.***, 35, 793 (2010).
    *Selected for Virt. J. of Ultrafast Sci., 9, 4 (2010).
    *Selected for Virt. J. of Quant. Info., 10, 4 (2010).
18. P. Ginzburg, A. Hayat, N. Berkovitch, M. Orenstein, "Nonlocal ponderomotive nonlinearity in plasmonics," ***Opt. Lett.*** 35, 1551 (2010).
    *Selected for Virt. J. of Ultrafast Sci., 10, 1 (2010).
19. P. Ginzburg, M. Shalyt, A. Hayat, M. Orenstein, "Photon-energy qubit generation by spontaneous emission in a V-type system", ***J. Phys. B***, 43, 105502 (2010).
20. A. Nevet, N. Berkovitch, A. Hayat, P. Ginzburg, S. Ginzach, O. Sorias, M. Orenstein, "Plasmonic Nano-Antennas for Broadband Enhancement of Two-Photon Emission from Semiconductors", ***Nano Letters***, 10, 1848 (2010).
21. S. Rosenblum, A. Hayat, P. Ginzburg, D. Neiman, M. Orenstein, "Photon hole nondemolition measurement scheme by electromagnetically induced transparency", ***Phys. Rev. A***, 81, 053848 (2010).
22. A. Nevet, A. Hayat, M. Orenstein "Measurement of optical two-photon gain in electrically pumped AlGaAs at room temperature", ***Phys. Rev. Lett.,*** 104, 207404 (2010).
    *Selected for Virt. J. of Ultrafast Sci., 9, 6 (2010).
23. A. Nevet, A. Hayat, M. Orenstein "Ultrafast pulse compression by semiconductor two-photon gain", ***Opt. Lett.***, **35**, 3877 (2010).
    *Selected for Virt. J. of Ultrafast Sci., 10, 1 (2010).
24. A. Nevet, A. Hayat, M. Orenstein " Ultrafast three-photon counting in a photomultiplier tube", ***Opt. Lett.***, **36**, 725 (2011).
    *Selected for Virt. J. of Ultrafast Sci., 10, 5 (2010).
25. A. Hayat, A. Nevet, P. Ginzburg, M. Orenstein, "Applications of two-photon processes in semiconductor photonic devices: invited review", ***Semicond. Sci. Technol***., 26, 083001 (2011).
26. A. Nevet, A. Hayat, P. Ginzburg, M. Orenstein, " Indistinguishable photon pairs from independent true chaotic sources", ***Phys. Rev. Lett.,*** 107, 253601 (2011).
27. A. Hayat, C. Lange, L. A. Rozema, A. Darabi, H. M. van Driel, A. M. Steinberg, B. Nelsen, D. W. Snoke, L. N. Pfeiffer, K.W. West, "Dynamic Stark effect in strongly coupled microcavity exciton-polaritons", ***Phys. Rev. Lett.*** 109, 033605 (2012).
28. L. A. Rozema, A. Darabi, D. H. Mahler, A. Hayat, Y. Soudagar, A. M. Steinberg, "Violation of Heisenberg's measurement-disturbance relationship by weak measurements.", ***Phys. Rev. Lett.*** 109, 100404 (2012).
    * PRL Editor's suggestion. Featured in Physics.

* Reported on the BBC News, NBC News and CBS News.
* Highlighted in Nature, Phys.org, OPN, Popular Mechanics, Scientific American and in Science News

29. P. Zareapour†, A. Hayat†, S.Y.F. Zhao, M. Kreshchuk, A. Jain, D. C. Kwok, N. Lee, S.-W. Cheong, Z. Xu, A. Yang, G. D. Gu, R. J. Cava, K.S. Burch, "Proximity-induced high-temperature superconductivity in the topological insulators Bi_2Se_3 and Bi_2Te_3", **Nature Commun.** 3, 1056 (2012).
    †equal contribution
    * Reported on the NBC News and the Metro News.
    * Highlighted in Phys.org and in Science Daily.
30. A. Hayat, P. Zareapour, S. Y. F. Zhao, A. Jain, I. G. Savelyev, M. Blumin, Z. Xu, A. Yang, G. D. Gu, H. E. Ruda, S. Jia, R. J. Cava, A. M. Steinberg, and K. S. Burch, "Hybrid high-temperature superconductor-semiconductor tunnel diode", ***Phys. Rev. X,*** 2, 041019 (2012).
    * Highlighted in Superconductor Week
31. A. Hayat, X. Xing, A. Feizpour, and A. M. Steinberg, "Multidimensional quantum information based on single-photon temporal wavepackets", ***Opt. Express*** 20, 29174 (2012).
32. R. Chang, S. Potnis, C. Ellenor, M. Siercke, A. Hayat and A. M. Steinberg, „ Observation of transient momentum-space interference during scattering of a condensate from an optical barrier ", ***Phys. Rev. A Phys. Rev. A*** 88, 053634 (2013).
33. A. Hayat, A. Feizpour, A. M. Steinberg, "Enhanced probing of fermion interaction using weak-value amplification", ***Phys. Rev. A*** 88, 062301 (2013).
34. E. Cancellieri, A. Hayat, A. M. Steinberg, E. Giacobino, A. Bramati, "Ultra-fast Stark-induced polaritonic switches", ***Phys. Rev. Lett.*** 112, 053601 (2014).
35. A. Hayat, H-Y Kee, K. S. Burch and A. M. Steinberg, "Cooper-pair-based photon entanglement without isolated emitters", ***Phys. Rev. B.*** 89, 094508 (2014).
    *Highlighted in Phys.org , Science Daily, EE Times, ECN, R&D Magazine, Compound Semiconductor, Superconductor Week and Photonics Online
36. R. Chang, S. Potnis , R. Ramos , C. Zhuang , M. Hallaji , A. Hayat , F. Duque-Gomez , J. E. Sipe , A. M. Steinberg, "Observing the onset of effective mass", ***Phys. Rev. Lett*** 112, 170404 (2014).
    *Highlighted in Phys.org
37. L. A. Rozema, J. Bateman , D. Mahler , R. Okamoto , A. Feizpour , A. Hayat , A. M. Steinberg, "Scalable spatial super-resolution using entangled photons", ***Phys. Rev. Lett*** 112, 223602(2014).
    * PRL Editor's suggestion. Featured in Physics.
38. L. A. Rozema, D.H. Mahler, A. Hayat, P. S. Turner and A. M. Steinberg, "Quantum data compression of a qubit ensemble", ***Phys. Rev. Lett*** 113, 160504 (2014).
    * PRL Editor's suggestion. Featured in Physics.
    * Highlighted in Nature, Physics World.
    * Selected among top-10 breakthroughs by Physics World
39. X. Xing, A. Feizpour, A. Hayat, A. M. Steinberg, "Experimental demonstration of a time-domain multidimensional quantum channel", ***Opt. Express*** 22, 25128 (2014
40. P. Zareapour, A. Hayat, S. Yang F. Zhao, M. Kreshchuk, Y. K. Lee, A. A. Reijnders, A. Jain, Z. Xu, T. S. Liu, G. D. Gu, S. Jia, R. J. Cava, and K. S. Burch., "Evidence for a new excitation at the interface between a high-Tc superconductor and a topological insulator", ***Phys. Rev. B Rapid Comm***., 90, 241106(R) (2014).
41. A. Hayat, C. Lange, L. A. Rozema, R. Chang, S. Potnis, H. M. van Driel, A. M. Steinberg, M. Steger, D. W. Snoke, L. N. Pfeiffer and K. W. West, „ Enhanced coherence between condensates formed resonantly at different times." ***Opt. Express.*** 22, 30559 (2014).
42. L. A. Rozema, D. H. Mahler, A. Hayat, A. M. Steinberg, "A Note on Different Definitions of Momentum Disturbance",***. Quantum Stud.: Math. Found***., 2, 14 (2015)

43. L. A. Rozema, C. Wang, D. H. Mahler, A. Hayat, A. M. Steinberg, J. E. Sipe, and M. Liscidini, " Characterizing an entangled-photon source with classical detectors and measurements", ***Optica*** 2, 430 (2015).

Other publications

1. A. Hayat, P. Ginzburg, M. Orenstein, "Semiconductor Two-Photon Emission Sources", ***Optics and Photonics News 18, 23 Special Issue: Optics in 2007***.
2. A. Hayat, "Semiconductor Quantum Photonics", ***Optics & Photonics Focus,* 14,** 2 (2011).
3. A. Hayat, A. Feizpour and A. M. Steinberg. “Enhancing Metrology Sensitivity by Weak Measurements” , ***SPIE Newsroom,*** (14 Dec 2011).
4. A. Steinberg, A. Feizpour, L. Rozema, D. Mahler and A. Hayat „In Praise of Weakness, “, ***Physics World*** (March 2013).

Invited Talks

1. A. Hayat, “Semiconductor Two-Photon Emission”, NIST QiBEC seminar, NIST, MD, USA (2008).
2. A. Hayat, “Two-photon devices for quantum communications”, OASIS conference, Israel (2009).
3. A. Hayat, A. Nevet, M. Orenstein “Electrically induced two-photon transparency in semiconductors”, CLEO/Europe-EQEC, Munich, Germany, (2009).
4. P. Ginzburg, A. Hayat, N. Berkovitch, G. Rosenblatt, M. Orenstein, „Nano-plasmonic Devices: From Nano-confinement to Stopped Light“, PIERS 2009, Moscow, Russia. (2009).
5. M. Orenstein, A. Hayat, P. Ginzburg, A. Nevet, S. Rosenblum “Two Photon Emission, Entanglement and Gain from Semiconductors at Room Temperature", QELS, San Jose, CA, USA (2010).
6. A. Hayat, QI/AMO Seminar, University of Illinois, Urbana-Champaign. (2010).
7. A. Hayat. Quantum Optics CQIQC Seminar, University of Toronto (2010).
8. A. Hayat. Special Laser Seminar, ETH Zurich (2010).
9. A. Hayat. Quantum Optics Seminar, University of Vienna (2010).
10. A. Hayat, A. Darabi, L. A. Rozema, D. Mahler, Y. Soudagar, X. Xing, A. Feizpour and A. M. Steinberg, ”Applications of quantum photonics for communications and metrology”, Photonics West, San Francisco, CA, USA (2012) .
11. A. Steinberg, D. Mahler, L. Rozema, A. Darabi, A. Feizpour, X. Xing, Y. Soudagar, A. Hayat, “Experimental tradeoffs in quantum measurement: uncertainty relations, weak measurement and quantum metrology.”, QIM, Berlin, Germany (2012).
12. A. Hayat, "Proximity-induced high-temperature superconductivity in topological insulators”, CAP conference, Montreal, Canada (2013).
13. A. Hayat, “Interaction of light with novel states of matter", Applied Physics Special Seminar, Stanford University, Stanford, CA, USA (2012).
14. A. Hayat, " High-temperature superconductivity in topological insulators." APS March Meeting, Baltimore, MD, USA (2013).
15. L. A. Rozema, D. Mahler, A. Hayat, P. Turner, A. M. Steinberg, “Experimental demonstration of quantum data compression”, PQE, Snowbird, Utah, USA (2013).
16. A. Hayat, "Quantum information processing with novel states of matter", CIFAR Global Academy Meeting, Banff, AB, Canada (2014).

17. A. Hayat “Quantum information based on novel states of matter”, CIFAR Quantum Information Science Meeting, QC, Canada (2014).
18. A. Hayat “Quantum devices with novel states of matter”, IEEE INEC conference, Hokkaido, Japan (2014).
19. A. Hayat "Interaction of light with novel states of matter ". University of Tokyo. (2014).
20. A. Hayat “Quantum devices with novel states of matter”, International Workshop on Nanophotonics, Wurzburg, Germany (2014).
21. A. Hayat, Condensed matter physics seminar. Hebrew University, Jerusalem (2015).
22. E. Sabag, R. Marjieh, R. Winik, S. Bouscher, N. Ginzberg, V. Perepelook, L. Rybak and A. Hayat “Superconducting optoelectronic devices”, Frontiers in Optics/Laser Science, San Jose, CA, USA (2015).

Issued patents

1. A. Nevet, A. Hayat, M. Orenstein, “System and method and for analyzing light by three-photon counting”, US 8669512 (2014)
2. A. Hayat, A. Lahav, M. Orenstein, "Focused ion beam deep nano-patterning method”. US 8557707 (2013).
3. A. Hayat, P. Ginzburg, M. Orenstein, “Light source based on simultaneous two-photon emission”. US 8921826 (2014).

Filed patents

1. A. Hayat, A. Nevet, M. Orenstein, “Semiconductor two-photon device”. US20120223354.

Contributed conference papers

1. D. Castiel, A. De-la-Zerda, A. Hayat, M. Katz, T. Mor, M. Orenstein, G. Ratzabi, N. Yoran, “Two- Color Parametric Down Conversion ”, Proc. SPIE 5815, pp. 40-45 (2005).
2. A. Hayat, M. Orenstein, “Two-Photon Based Semiconductor Entanglement-Sources and Detectors for Quantum Communications”, paper MM3, LEOS, Montreal, Que., Canada (2006).
3. A. Hayat, M. Orenstein, “On-Demand Photon-Number State Generation via Cavity Parametric Down Conversion”, LEOS, Canada (paper ThK2) (2006).
4. A. Hayat, P. Ginzburg, M. Orenstein, “IR Single-Photon Detection for Quantum Communications by Two-Photon Absorption in Si Detector”, paper P2-34, QCMC, Tsukuba, Japan (2006).
5. A. Hayat, P. Ginzburg, M. Orenstein, “High-Efficiency Entangled Photon Source via Microcavity-Controlled Two-Photon Spontaneous Emission”, paper P3-27, QCMC, Tsukuba, Japan (2006)
6. P. Ginzburg, A. Hayat, M. Orenstein, “Meta-Material for Nonlinear Optics with Self Phase-Matching ”, Nanometa, Austria (2007).
7. A. Hayat, M. Orenstein, “Interband Second-Order Susceptibility Enhancement in Strained GaInP/AlGaInP Quantum Wells" paper CThV7, CLEO, Baltimore, MD, USA (2007).
8. A. Hayat, A. Lahav, M. Orenstein "Enhanced Aspect Ratio of Focused Ion Beam Nanopatterning Technique in Semiconductors", paper CThW2, CLEO, Baltimore, MD, USA (2007).
9. A. Hayat, M. Orenstein, "Experimental Observation of Spontaneous Two-Photon Emission from Semiconductors", paper QMK3, QELS, Baltimore, MD, USA (2007).
10. A. Hayat, M. Orenstein, “Photon Emission by Photon Model for Spontaneous Frequency Conversion in Dispersive Dielectric Microcavities", paper JWA55, QELS, Baltimore, MD, USA (2007).
11. A. Hayat, P. Ginzburg, M. Orenstein, "Two-Photon Based Semiconductor Entanglement-Source for Quantum Communications ", paper JTuA25, QELS, Baltimore, MD, USA (2007).
12. P. Ginzburg, A. Hayat, and M. Orenstein, "Nonlinearity and Extraordinary Self Focusing of Surface Plasmon Polariton by Ponderomotive Forces", paper 67, NANO, Hangzhou, China, (2007).

13. A. Hayat, P. Ginzburg, M. Orenstein, " Widely Tunable Low-Threshold Semiconductor Two-Photon Laser", paper CMI52, CQO9, Rochester, NY, USA (2007).
14. A. Hayat, M. Orenstein, "Experimental Observation of Spontaneous Two-Photon Emission from Semiconductors ", paper CSuA33, CQO9, Rochester, NY, USA (2007).
15. A. Hayat, M. Orenstein, "Self-Phasematched Nonlinear Optics in Integrated Semiconductor Microcavities ", paper JWC6, CQO9, Rochester, NY, USA (2007).
16. A. Hayat, M. Orenstein, " Quantum-Field Model for Dispersive-Microcavity Spontaneous Photon Conversion", paper JWC4, CQO9, Rochester, NY, USA (2007).
17. A. Hayat, P. Ginzburg, M. Orenstein, "Entangled Photon Spectroscopy and Communications Based on Semiconductor Two-Photon Process ", paper JWC63, ICQI, Rochester, NY, USA (2007).
18. A. Hayat, M. Orenstein, "Two-Photon Emission from Semiconductor Device", paper MC7, NLO, Hawaii, USA (2007).
19. A. Hayat, M. Orenstein, "SHG with Self-Phasematching in a Semiconductor Microcavity ", paper MD2, NLO, Hawaii, USA (2007).
20. A. Hayat, E. Small, Y. Elor, M. Orenstein, "Nonlinear Optics in Quantum Structures with Long-Period Linear Grating Phasematching", paper WE6, NLO, Hawaii, USA (2007).
21. P. Ginzburg, A. Hayat, M. Orenstein, "Nonlinear Optics in QWs with Tunable Local Phasematching", paper WE9, NLO, Hawaii, USA (2007).
22. P. Ginzburg, A. Hayat, E. Feigenbaum, N. Berkovitch, M. Orenstein, "Self Focusing of Surface Plasmon Polariton and Nonlinear Response of Plasmonic Waveguiding by Ponderomotive Forces", paper WB6, NLO, Hawaii, USA (2007).
23. A. Hayat, P. Ginzburg, N. Kaminski and M. Orenstein" Semiconductor Devices Based on Two-Photon Emission" proc. page 378, LEOS, Lake Buena Vista, FL, USA (2007).
24. N. Kaminski, A. Hayat, P. Ginzburg, M. Orenstein, "Nonlinear Compression toward Few-Cycle Pulses in Two-Photon Semiconductor Amplifiers ", paper CWI6, CLEO, San Jose, CA, USA (2008).
25. N. Kaminski, A. Hayat, P. Ginzburg, M. Orenstein, "Semiconductor Two-Photon Laser: Ultra-Short Pulses and Wide Tuneability", paper IMA3, INPRA, Boston, MA, USA (2008).
26. V. Vishnyakov, P. Ginzburg, A. Hayat, M. Orenstein, "Non-Hermitian Quantum Mechanics for Linear Photonic Logic", paper IWG2, INPRA, Boston, MA, USA (2008).
27. A. Hayat, P. Ginzburg, D. Neiman, S. Rosenblum, M. Orenstein, "Toward Hyperentanglement via Semiconductor Two-Photon Emission ", paper QMC7, ICQI, Boston, MA, USA (2008).
28. A. Hayat, P. Ginzburg, M. Orenstein, "Photon Energy Entanglement Characterization by Electronic Transition Interference", paper JMB60, ICQI, Boston, MA, USA (2008).
29. A. Hayat, P. Ginzburg, D. Neiman, S. Rosenblum, M. Orenstein "Photon-Hole Nondemolition Measurement by Quantum Interference" paper QWB6, ICQI, Boston, MA, USA (2008).
30. A. Hayat, P. Ginzburg, M. Orenstein, "Semiconductor two-photon emission", paper Mo-A4d-3, ICPS, Brazil (2008).
31. N. Kaminski, A. Hayat, P. Ginzburg, M. Orenstein, "Semiconductor two-photon laser: wide tunability and ultrashort pulses", paper Fr-M1a-3, ICPS, Rio de Janeiro, Brazil (2008).
32. A. Hayat, P. Ginzburg, M. Orenstein, "Divergence-free quantum theory of nondegenerate two-photon processes in semiconductors", paper Tu-PC3-147, ICPS, Rio de Janeiro, Brazil (2008).
33. A. Hayat, P. Ginzburg, D. Neiman, S. Rosenblum, M. Orenstein, "Nondemolition Photon-Hole Measurement by Quantum Interference", QCMC, Canada (2008).
34. A. Hayat, P. Ginzburg, P. Gurevich, D. Neiman, S. Rosenblum, M. Orenstein, "Quantum-optical sources via semiconductor two-photon emission", QCMC, Canada (2008).

35. P. Ginzburg, A. Hayat, and M. Orenstein, "Breakdown of Surface Plasmon Enhancement due to Ponderomotive Forces", Plasmonics and Metamaterials (META), Rochester, NY, USA, paper MThC8, October (2008).
36. P. Ginzburg, A. Hayat, N. Berkovitch, and M. Orenstein, "Nonlinear Propagation and Slow Light of Surface Plasmon Polaritons due to Ponderomotive Forces", Plasmonics and Metamaterials (META), Rochester, NY, USA, paper JWD25, October (2008).
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