

**Alberto Bilenca, Ph.D.****Peer-Reviewed Journals**

33. **A. Bilenca**, T. Lasser, B. Bouma, R. Leitgeb, G. Tearney, "Information limits of optical coherence imaging through scattering media," *IEEE Photonics Journal*, Vol. 1, pp. 119-127, 2009.
32. **A. Bilenca**, J. Cao, M. Colice, A. Ozcan, B. Bouma, L. Raftery, G. Tearney, "Fluorescence Interferometry: Principles and Applications in Biology," *Annals of the New York Academy of Sciences*, Vol. 1130, pp. 68-77, 2008 (**Invited Paper**).
31. A. Ozcan, E. Cubukcu, **A. Bilenca**, K. B. Crozier, B. Bouma, F. Capasso, G. Tearney, "Differential near-field scanning optical microscopy using sensor arrays," *IEEE J. of Selected Topics in Quantum Electronics*, Vol. 13, pp. 1721-1729, 2007 (**Invited Paper**).
30. Y. Yadin, M. Nazarathy, **A. Bilenca**, M. Orenstein, "Multichip differential phase-shift-keyed transmission over (non)linear optical channels," *IEEE Journal of Lightwave Technology*, Vol. 25, pp. 1431-1440, 2007.
29. A. Desjardins, B. Vakoc, **A. Bilenca**, G. Tearney, B. Bouma, "Estimation of the scattering coefficients of turbid media using angle-resolved optical frequency domain imaging," *Optics Lett.*, Vol. 32, pp. 1560-1562, 2007.  
\* Selected to appear in the Virtual Journal for Biomedical Optics, Vol. 2, 2007.
28. A. Ozcan, **A. Bilenca**, A. Desjardin, B. Bouma, G. Tearney, "A study of speckle reduction in optical coherence tomography images using digital filtering," *J. of the Optical Society of America A*, Vol. 24, pp. 1901-1910, 2007.  
\* Selected to appear in the Virtual Journal for Biomedical Optics, Vol. 2, 2007.
27. **A. Bilenca**, T. Lasser, A. Ozcan, R. Leitgeb, B. Bouma, G. Tearney, "Image formation in fluorescence coherence-gated imaging through scattering media," *Optics Express*, Vol. 15, pp. 2810-2821, 2007.  
\* Selected to appear in the Virtual Journal for Biomedical Optics, Vol. 2, 2007.
26. J.P. Reithmaier, A. Somers, W. Kaiser, S. Deubner, F. Gerschütz, A. Forchel; O. Parillaud, M. Krakowski; R. Alizon, D. Hadass, **A. Bilenca**, H. Dery, V. Mikhelash-vili, G. Eisenstein; M. Gioannini, I. Montrosset; T. Berg, M. van der Poel, J. Mørk, B. Tromborg, "Semiconductor quantum dots devices: Recent advances and application prospects," *Physica Status Solidi B: Basic Research*, Vol. 243, pp. 3981-3987, 2006.
25. A. Ozcan, E. Cubukcu, **A. Bilenca**, K. B. Crozier, B. Bouma, F. Capasso, G. Tearney, "Differential Near-Field Scanning Optical Microscopy," *Nano Lett.*, Vol. 6, pp. 2609-2616, 2006.  
\* Highlighted in the Photonics Spectra Magazine, January 2007.
24. A. Ozcan, **A. Bilenca**, B. Bouma, G. Tearney, "Mirror tunnel microscope," *Appl. Phys. Lett.*, Vol. 89, p. 131124, 2006.
23. **A. Bilenca**, A. Ozcan, B. Bouma, G. Tearney, "Fluorescence coherence tomography," *Optics Express*, Vol. 14, pp. 7134-7143, 2006.  
\* Highlighted in a research story in the Biophotonics International Magazine, October 2006. Selected to appear in the Virtual Journal for Biomedical Optics, Vol. 1, 2006.
22. S. Nadkarni, **A. Bilenca**, B. Bouma, G. Tearney, "Measurement of fibrous cap thickness in atherosclerotic plaques by spatio-temporal analysis of laser speckle images," *J. Biomed. Optics*, Vol. 11, p. 021006, 2006.
21. **A. Bilenca**, S. Yun, G. Tearney, B. Bouma, "Numerical study of wavelength-swept semiconductor ring lasers: The role of refractive-index nonlinearities in SOAs and implications for biomedical imaging applications," *Optics Lett.*, Vol. 31, pp. 760-762, 2006.  
\* Selected to appear in the Virtual Journal for Biomedical Optics, Vol. 1, 2006.

20. **A. Bilenca**, A. Desjardins, B. Bouma, G. Tearney, "Multicanonical Monte-Carlo simulations of light propagation in biological media," *Optics Express*, Vol. 13, pp. 9822-9833, 2005.
19. Y. Yadin, **A. Bilenca**, M. Nazarathy, "Soft Detection of Multichip DPSK over the nonlinear fiber-optic channel," *IEEE Photonics Technology Lett.*, Vol. 17, pp. 2001-2003, 2005.
18. **A. Bilenca**, G. Eisenstein, "Fokker-Planck and Langevin analyses of noise accompanying the amplification of optical pulses in semiconductor optical amplifiers," *J. of the Optical Society of America B*, Vol. 22, pp. 1632-1639, 2005.
- \* Selected to appear in the Virtual Journal of Ultrafast Science, Vol. 4, 2005.
17. J.P. Reithmaier, A. Somers, S. Deubert, R. Schwertberger, W. Kaiser, A. Forchel; M. Calligaro, P. Resneau, O. Parillaud, S. Bansropun, M. Krakowski; R. Alizon, D. Hadass, **A. Bilenca**, H. Dery, V. Mikhelashvili, G. Eisenstein; M. Gioannini, I. Montrosset; T. Berg, M. van der Poel, J. Mørk, B. Tromborg, "InP based lasers and optical amplifiers with wire-/dot-like active regions," *J. Phys. D: Appl. Phys.*, Vol. 38, pp. 2088-2102, 2005.
16. D. Hadass, **A. Bilenca**, R. Alizon, H. Dery, V. Mikhelashvili, G. Eisenstein; R. Schwertberger, A. Somers, J.P. Reithmaier, A. Forchel; M. Calligaro, S. Bansropun, M. Krakowski, "Gain and noise saturation of wide-band InAs / InP quantum dash optical amplifiers: Model and experiments," *IEEE J. of Selected Topics in Quantum Electronics*, Vol. 11, pp. 1015-1026, 2005.
15. **A. Bilenca**, G. Eisenstein, "Statistical noise properties of an optical pulse propagating in a nonlinear semiconductor optical amplifier," *IEEE J. of Quantum Electronics*, Vol. 41, pp. 36-44, 2005.
14. **A. Bilenca**, G. Eisenstein, "On the noise properties of linear and nonlinear quantum dot semiconductor optical amplifiers: The impact of inhomogeneously broadened gain and fast carrier dynamics," *IEEE J. of Quantum Electronics*, Vol. 40, pp. 690-702, 2004.
13. D. Dahan, **A. Bilenca**, G. Eisenstein, "Noise-reduction capabilities of a Raman mediated wavelength converter," *Optics Lett.*, Vol. 28, pp. 634-636, 2003.
12. D. Dahan, R. Alizon, **A. Bilenca**, G. Eisenstein, "Optical noise reduction in inter-band Raman mediated wavelength conversion," *Electron. Lett.*, Vol. 39, pp. 307-308, 2003.
11. R. Alizon, **A. Bilenca**, H. Dery, V. Mikhelashvili, G. Eisenstein, R. Schwertberger, D. Golg, J.P. Reithmaier, A. Forchel, "Cross-gain modulation in inhomogeneously broadened gain spectra of InP based 1550 nm quantum dash optical amplifiers: Small-signal bandwidth dependence on wavelength detuning," *Appl. Phys. Lett.*, Vol. 82, pp. 4660-4662, 2003.
10. **A. Bilenca**, R. Alizon, V. Mikhelashvili, D. Dahan, G. Eisenstein, R. Schwertberger, D. Gold, J.P. Reithmaier, A. Forchel, "Broadband wavelength conversion based on cross-gain-modulation and four-wave-mixing in InAs/InP quantum dash semiconductor optical amplifiers operating at 1550 nm," *IEEE Photonics Technology Lett.*, Vol. 15, pp. 563-565, 2003.
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8. J. Lasri, **A. Bilenca**, D. Dahan, V. Sidorov, G. Eisenstein, D. Ritter, "A self-starting hybrid optoelectronic oscillator generating ultra low jitter 10 GHz optical pulses and low phase noise electrical signals," *IEEE Photonics Technology Lett.*, Vol. 14, pp. 1004-1006, 2002.
7. **A. Bilenca**, D. Dahan, J. Lasri, G. Eisenstein, "All-optical processing by fiber delay and four-wave-mixing of high-bit-rate non return to zero signals for timing extraction by optical injection locking," *IEEE Photonic Technology Lett.*, Vol. 14, pp. 852-854, 2002.

6. **A. Bilenca**, J. Lasri, D. Dahan, G. Eisenstein, D. Ritter, "High bit rate clock recovery of NRZ data: All optical processing in a semiconductor optical amplifier and direct optical injection locking of a self oscillating photo-transistor," *IEEE Photonics Technology Lett.*, Vol. 14, pp. 399-401, 2002.
5. J. Lasri, D. Dahan, **A. Bilenca**, G. Eisenstein, D. Ritter, "Clock recovery at multiple bit rates using direct optical injection locking of a self oscillating InGaAs / InP heterojunction bipolar photo-transistor," *IEEE Photonics Technology Lett.*, Vol. 13, pp. 1355-1357, 2001.
4. J. Lasri, **A. Bilenca**, G. Eisenstein, D. Ritter, "Optoelectronic mixing, modulation and injection locking in millimeter wave self-oscillating InP / InGaAs heterojunction bipolar photo-transistors: Single and dual transistor configurations," *IEEE Transactions on Microwave and Techniques*, Vol. 49, pp. 1934-1939, 2001.
3. **A. Bilenca**, J. Lasri, B. Sheinman, G. Eisenstein, D. Ritter, "Millimeter wave generation and digital modulation in an InGaAs / InP heterojunction photo transistor: Model and experimental characterization of dynamics and noise," *IEEE Journal of Lightwave Technology*, Vol. 19, pp. 1340-1351, 2001.
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#### **Submitted / In-Preparation Journal Papers**

3. Y. Jeon, **A. Bilenca**, "In vivo imaging of blood flow using a handheld probe based on light scattering detection," in preparation, 2010.
2. F. Ma, **A. Bilenca**, "Sub-diffraction-limit imaging using multiple-molecule localization microscopy," in preparation, 2010.
1. I. Märki, N. Bocchio, S. Geissbuehler, F. Aguet, **A. Bilenca**, T. Lasser, "Three-dimensional nano-localization of single fluorescent emitters," submitted to a journal, 2010.

#### **Invited Book Chapters**

1. M. Leutenegger, K. Hassler, P. Rigler, **A. Bilenca**, T. Lasser, "Single molecule detection at surfaces: Dual-color fluorescence fluctuation spectroscopy with total internal reflection excitation," in K. Kneipp K., R. Aroca, H. Kneipp, (eds.) "New Approaches in Biomedical Spectroscopy," *American Chemical Society Books*, 2007.

#### **Presentations**

##### **Invited**

13. **A. Bilenca**, "Fluorescence Interferometry: From mesoscopic to nanoscopic biomedical imaging", *IEEE Winter Topical Meeting -- Advanced Imaging in Bio-Photonics*, Spain, 2010.
12. **A. Bilenca**, "Fluorescence Coherence Microscopy: From mesoscopic- to nanometric- scale optical resolution," *UCLA Bio-Photonics Workshop*, Los Angeles, California, 2008.
11. A. Ozcan, E. Cubukcu, **A. Bilenca**, B. Bouma, F. Capasso, G. Tearney, "Differential near-field scanning optical microscopy based on sensor arrays," *SPIE Photonics West'08*, San Jose, California, 2008 (presented by A. O.).

10. **A. Bilenca**, J. Cao, B. Bouma, L. Raftery, G. Tearney, "A new imaging paradigm: Fluorescence Coherence Tomography," *10th Conference on 'Methods and Applications of Fluorescence: Spectroscopy, Imaging and Probes' (MAF-10)*, Salzburg, Austria, 2007 (presented by A. B.).
9. **A. Bilenca**, B. Bouma, G. Tearney, "Coherence gating in fluorescence imaging: Design, capabilities and limitations," *SPIE Photonics North'07*, Ottawa, Canada, 2007 (presented by A. B.).
8. **A. Bilenca**, B. Bouma, G. Tearney, "A new imaging paradigm: Molecular Coherence Microscopy," *Nature Medicine*, Massachusetts General Hospital and Karolinska Institutet international meeting of 'Days of Molecular Medicine 2007 - Emerging Technologies and Cancer Biology', Boston, 2007 (presented by A. B.).
7. **A. Bilenca**, D. Hadass, R. Alizon, H. Dery, V. Mikhelashvili, G. Eisenstein; A. Somers, W. Kaiser, S. Deubert, J.P. Reithmaier, A. Forchel; M. Calligaro, S. Bansropun, M. Krakowski, "Gain and noise properties of InAs / InP quantum dash semiconductor optical amplifiers," *Proc. SPIE Int. Soc. Opt. Eng.*, Invited paper 6014-04, *OpticsEast'05*, 2005 (presented by A. B.).
6. G. Eisenstein, D. Hadass, **A. Bilenca**, H. Dery, V. Mikhelashvili, A. Somers, W. Kaiser, S. Deubert, J.P. Reithmaier, A. Forchel, M. Calligaro, S. Bansropun, M. Krakowski, "Gain dynamics and noise properties of 1550nm quantum dash optical amplifiers," *International Union of Radio Science*, Invited paper D07b.3, 2005 (presented by G. E.).
5. J.P. Reithmaier, S. Deubert, R. Krebs, F. Klopff, R. Schwertberger, A. Somers, L. Bach, W. Kaiser, A.W. Forchel; R. Alizon, D. Hadass, **A. Bilenca**, H. Dery, V. Mikhelashvili, G. Eisenstein; M. Calligaro, S. Bansropun, M. Krakowski, "Lasers and amplifiers based on quantum-dot-like gain material," *Proc. SPIE Int. Soc. Opt. Eng.*, Invited paper 5361, *PhotonicsWest'04*, 2004 (presented by J.P. R.).
4. J.P. Reithmaier., S. Deubert, A. Somers, W. Kaiser, A. Forchel; S. Auzanneau, M. Calligaro, N. Michel, S. Bansropun, M. Krakowski, B. Sumpf, G. Erbert, J. Fricke, G. Trankle; D. Hadass, **A. Bilenca**, H. Dery, V. Mikhelashvili, G. Eisenstein, "Quantum dot semiconductor lasers," *LEOS'04*, 2004 (presented by J.P. R.).
3. J.P. Reithmaier, R. Schwertberger, D. Gold, A. Forchel; **A. Bilenca**, R. Alizon, V. Mikhelashvili, D. Dahan, G. Eisenstein, "InAs on InP quantum dots for optoelectronic applications," *CLEO/Europe '03*, 2003 (presented by J.P. R.).
2. G. Eisenstein, **A. Bilenca**, R. Alizon, V. Mikhelashvili; R. Schwertberger, D. Gold, J.P. Reithmaier, A. Forchel, "Linear and non-linear characteristics of InAs / InP quantum dash semiconductor optical amplifiers," Invited paper WB4, *OAA'03*, 2003 (presented by G. E.).
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### **Contributed**

44. F. Ma, **A. Bilenca**, "Statistical hypothesis testing for super-resolution localization imaging at high speed," accepted to *CLEO'10*, San Jose, California, 2010.
43. F. Ma, **A. Bilenca**, "The mathematical nanoscope: obtaining sub-diffraction-limited resolution by multiple hypothesis testing," Paper 7571-37, *PhotonicsWest'10*, 2010.
42. I. Märki, N. Bocchio, S. Geissbühler, F. Aguet, **A. Bilenca**, T. Lasser, "Three-dimensional localization of single particles at the nanoscale," Paper 7571-35, *PhotonicsWest'10*, 2010.
41. I. Maerki, T. Lasser, **A. Bilenca**, "Single molecule interference: Towards three-Dimensional fluorescence localization microscopy at the molecular level," *CLEO'09*, Baltimore, 2009.

40. **A. Bilenca**, I. Maerki, B. Bouma, G. Tearney, T. Lasser, "Low-level light interferometry: Principles and applications in the life sciences," Paper 7188-24, *PhotonicsWest'09*, 2009.
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37. A. Ozcan, E. Cubukcu, **A. Bilenca**, K. Crozier, B. Bouma, F. Capasso, G. Tearney, "Differential near-field scanning optical microscopy," Paper QTuK3, *CLEO'07*, Baltimore, 2007.
36. **A. Bilenca**, C. Joo, A. Ozcan, J. de Boer, B. Bouma, G. Tearney, "The role of amplitude and phase in fluorescence coherence imaging: From wide field to nanometer depth profiling," Paper CTuV1, *CLEO'07*, Baltimore, 2007.
35. A. Ozcan, **A. Bilenca**, A. Desjardins, B. Bouma, G. Tearney, "Digital speckle reduction in optical coherence tomography," Paper 6429-67, *PhotonicsWest'07*, 2007.
34. A. Ozcan, **A. Bilenca**, B. Bouma, G. Tearney, "Lensless differential microscopy for high resolution imaging," Paper 6443-16, *PhotonicsWest'07*, 2007.
33. A. Ozcan, **A. Bilenca**, B. Bouma, G. Tearney, "Mirror tunnel microscopy for wide field imaging," Paper 6443-07, *PhotonicsWest'07*, 2007.
32. **A. Bilenca**, A. Ozcan, A. Desjardins, B. Bouma, G. Tearney, "On the information capacity of coherence-gated imaging through turbid media," Paper 6443-02, *PhotonicsWest'07*, 2007.
31. **A. Bilenca**, A. Ozcan, B. Bouma, G. Tearney, "Fluorescence coherence tomography," Paper 6436-03, *PhotonicsWest'07*, 2007.
30. **A. Bilenca**, A. Ozcan, B. Bouma, G. Tearney, "Spectral-domain fluorescence coherence tomography", *Gordon Research Conference on 'Lasers in medicine and biology'*, 2006.  
\* This work was awarded the outstanding poster prize by the committee of the Gordon conference.
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28. S. Nadkarni, **A. Bilenca**, B. Bouma, G. Tearney, "Measurement of fibrous cap thickness in necrotic core fibroatheromas using laser speckle imaging," Paper 6078E-81, *PhotonicsWest'06*, 2006.
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26. **A. Bilenca**, S. Yun, G. Tearney, B. Bouma, "On the dynamics of rapidly-tuned semiconductor ring lasers," Paper 6115-70, *PhotonicsWest'06*, 2006.
25. **A. Bilenca**, S. Yun, G. Tearney, B. Bouma, "Dynamics of a wavelength-swept SOA-based ring laser with an intra-cavity tunable filter for biomedical imaging applications," *International Symposium on Optical Coherence Tomography*, 2005.
24. A. Chau, J. Motz, **A. Bilenca**, B. Bouma, G. Tearney, "Monte-Carlo simulations of Fluorescent and Raman scattering in biological media," *Harvard Medical School and Wellman Center for Photomedicine, Massachusetts General Hospital Workshop*, 2005.

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21. **A. Bilenca**, G. Eisenstein, "Is the statistics of an amplified optical pulse in semiconductor optical amplifiers Gaussian?," *CLEO/QELS'05*, 2005.
20. **A. Bilenca**, G. Eisenstein, "Understanding the statistical noise properties of an optical pulse propagating in a nonlinear semiconductor optical amplifier (SOA): Experimental and theoretical study," *OFC'05*, 2005.
19. D. Hadass, **A. Bilenca**, R. Alizon, H. Dery, V. Mikhelashvili, G. Eisenstein; R. Schwertberger, A. Somers, J.P. Reithmaier, A. Forchel; M. Calligaro, S. Bansropun, M. Krakowski, "InAs / InP QDash SOA static gain and noise saturation," *Summer school on 'Semiconductor Quantum Dots: Physics and Devices'*, 2004.
18. **A. Bilenca**, G. Eisenstein, "On the noise properties of quantum dot optical amplifiers," *ETOS'04*, 2004.
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12. **A. Bilenca**, R. Alizon, D. Dahan, G. Eisenstein, R. Schwertberger, D. Gold, J.P. Reithmaier, A. Forchel, "Multi -THz wavelength conversion by four-wave-mixing and cross-gain-modulation in an InAs / InP quantum dash semiconductor optical amplifier operating at 1.55  $\mu\text{m}$ ," paper ThO2, *OFC'03*, 2003.
11. R. Alizon, **A. Bilenca**, V. Mikhelashvili, G. Eisenstein, R. Schwertberger, D. Golg, J.P. Reithmaier, A. Forchel, "Linear and non-linear characteristics of InAs / InP quantum dash semiconductor optical amplifiers at 1550 nm," Post-deadline paper 3.9, *ECOC'02*, 2002.
10. **A. Bilenca**, D. Dahan, J. Lasri, G. Eisenstein, "Jitter characteristics of a four-wave-mixing based clock extractor," *ECOC'02*, 2002.
9. J. Lasri, **A. Bilenca**, D. Dahan, V. Sidorov, G. Eisenstein, D. Ritter, K. Ivind, "An ultra low noise self-starting pulse generator," *ECOC'02*, 2002.
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5. **A. Bilenca**, J. Lasri, G. Eisenstein, D. Ritter, "Noise properties of a digitally modulated millimeter wave source based on InGaAs / InP bipolar heterojunction photo transistor placed in an optically amplified system," *Proc. LEOS'00 Annual Meeting*, paper TuX2, pp. 322-323, 2000.
4. **A. Bilenca**, J. Lasri, G. Eisenstein, D. Ritter, M. Orenstein, V. Sidorov, S. Cohen, P. Goldgeier, "Experimental demonstration and modeling of optoelectronic mixing and digital modulation in a single InP photo heterojunction bipolar transistor," *International Topical Meeting on 'Microwave Photonics', MWP'00 Digest*, paper WE2.14, pp. 203-206, 2000.
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1. J. Lasri, P. Goldgeier, **A. Bilenca**, G. Eisenstein, M. Orenstein, D. Ritter, "Wavelength locking of DFB lasers at 50 GHz spacing using a single fiber grating reference and a photo-heterojunction bipolar transistor optoelectronic mixer," *International Topical Meeting on Microwave Photonics, MWP'99 Digest*, post-deadline Session, pp. 13-16.