

MICHAL LIPSON, PHD

Eugene Higgins Professor, Columbia University

Email: ml3745@columbia.edu Website: <http://www.ee.columbia.edu/michal-lipson>

PROFILE: MacArthur Fellow, pioneer in the field of silicon photonics, 45+ US patents granted; Thomson-Reuters top 1% most highly cited researcher in physics , 300+ technical publications 40,000+ citations; *h*-index: 100

ADDRESS

Department of Electrical Engineering
Columbia University
School of Electrical Engineering
530 West 120th St, MC 8903, Suite: 1006
New York, NY 10027
Phone: (212) 853-060

EDUCATION

B.S. Physics, Technion, Israel, 1992
M.S. Physics, Technion, Israel, 1994
Ph.D. Physics, Technion, Israel, 1998

ACADEMICS

Eugene Higgins Professor of Electrical Engineering, Columbia University, Columbia University, 2015-present

Given Professor of Engineering, School of Electrical and Computer Engineering, Cornell University, 2013-2015

Associate Professor, School of Electrical and Computer Engineering, Cornell University, 2007-2013

Assistant Professor, School of Electrical and Computer Engineering, Cornell University, 2001 – 2007

Postdoctoral Associate, Department of Material Science, Massachusetts Institute of Technology (MIT) 1999 – 2001

HONORS AND AWARDS

Erna Hamburger Award, 2020

Member of the National Academy of Sciences (NAS), 2019

Comstock Prize in Physics (NAS), 2019

IEEE Photonics Award, 2019

Honorary Degree of Doctor in Science, Trinity College of Dublin, 2018

R. W. Wood Prize, Optical Society of America (OSA), 2017

Thomson-Reuter, top 1% most highly cited researcher in Physics every year since 2014

IEEE Fellow, 2013

MacArthur Fellow, 2010

Blavatnik Award, NY State Academy of Science, 2010

Optical Society of America (OSA) Fellow, 2007

Fulbright Fellowship, 2007

IBM Faculty Award, 2006

NSF CAREER Award, 2004

ADVISORY BOARD MEMBERSHIP

Scientific board member, The Flagship on Photonics Research and Innovation (PREIN), Finland, (2019)

Evaluation Committee in the Field of Physics - Israel Council for Higher Education (2018)

National Academies AMO Decadal Survey Committee (2018)

Scientific Board Member, The Quantum Valley Ideas Lab (QVIL), Waterloo, CA (2018-)

Elected Board Member, Optical Society of America, (2016-2019)

Advisory Board Member, Department of Electrical and Computer Engineering (ECE) at Rice University (2013-)

Scientific Board Member, the New York Academy of Sciences Blavatnik Award for Young Scientists (2013-)

Co-Founder and Board Member, PicoLuz, Inc. (2009-)

Board Member, CRANN Nanoscience Institute, Trinity College Dublin, Ireland (2012-)

Editorial advisory Board Member, Advanced Optical Materials (2014-2016)

Elected Member of the Board of Governors, IEEE Photonics (2009-2012).

Editorial Board Member, Scientific Reports, Nature Publishing Group, (2012-2013)

Advisory Board Member, IEEE Photonics Journal, (2008-2012)

SELECTED SOCIETY AND CONFERENCE ORGANIZATION LEADERSHIP

General Chair, Conference on Lasers and Electro Optics (CLEO), San Jose, CA, 2019

{Program, Chair, Conference on Lasers and Electro Optics (CLEO), San Jose, CA, 2018

Technical Chair, Conference on Lasers and Electro Optics (CLEO), San Jose, CA, 2017

Member, OSA Joseph Fraunhofer Award/Robert M. Burley Prize Committee, 2017

Organizer, Workshop on Emerging Topics in Optics, institute for match and its applications, University of Minnesota, April 24 - 28, 2017

Technical Program Committee Member, Conference on Lasers and Electro Optics (CLEO), San Jose, CA, May 10-15, 2010-2015

Member, IEEE 2013 Young Investigator Award Committee 2012

Technical Program Committee member, Optical Society of America (OSA) Annual Meeting-Frontiers in Optics (FiO), Orlando, FL, October 6-10, 2013

Subcommittee member, Light-Matter Interactions at the Nanoscale, Conference on Lasers and Electro-Optics Europe(CLEO/Europe) and International Quantum Electronics Conference (IQEC), Munich, Germany, June 16-20, 2013

Subcommittee member, Latin America Optics and Photonics (LAOP) Conference, Sao Paulo, Brazil, 11-13 November, 2012

Subcommittee member, Nanophotonics, Conference on Lasers and Electro Optics (CLEO), 2010-2011

Subcommittee member, Nanophotonics Devices and Applications, Integrated Photonics Research and Applications (IPRA), Monterey, California, July 25-28 2010

Guest Editor, IEEE Journal of Selected Topics in Quantum Electronics 2009

Committee member, 2009, NAE Frontiers of Engineering, Beckman Center, Irvine CA September 10-12, 2009

Subcommittee Chair, Micro- & Nano-Photonics, Conference on Lasers and Electro Optics (CLEO), 2007-2009

Subcommittee Chair, Optical Society of America (OSA) Integrated Optics Technical Group, 2004- 2007

Technical program committee member, the 21st Annual Meeting of the IEEE Lasers and Electro-Optics (IEEE/LEOS) Society, Newport Beach, CA, November 9-13, 2008

Technical program committee member, 2008 Slow and Fast Light Topical Meeting, Boston, MA, July 13-16, 2008

Co-Chair, Frontiers in Nanophotonics and Plasmonics, Guarujá, SP Brazil, November 9-14, 2007

Committee member, Optical Interconnects & Processing Systems Committee, Annual Meeting of the IEEE Lasers and Electro Optics Society, Lake Buena Vista, FL, October 21-25, 2007

Program Committee member, Frontiers in Optics (FiO) - Optical Society of America (OSA) Annual Meeting, San Jose, California, September 16-20, 2007

Subcommittee chair, Nanophotonics Devices and Applications Integrated Photonics Research and Applications (IPRA), Salt Lake City, July 9-13, 2007

Subcommittee member, Nanophotonics Committee, Annual Meeting of the IEEE Lasers and Electro Optics (IEEE/LEOS) Society, Montreal, Quebec, Canada, October 29-November 2, 2006.

Topical Editor, Integrated Optics, Optics Letters, 2005-2006

Committee Member, International Advisory Committee, Group IV Photonics, Ottawa, Ontario, Canada, September 13-15, 2006

Subcommittee chair, Nanophotonics Devices and Applications Integrated Photonics Research and Applications (IPRA), Salt Lake City, Utah, July 9-13, 2006

Subcommittee member, Fundamentals of Metamaterials, Conference on Lasers and Conference on Lasers and Electro-Optics (CLEO), Long Beach, CA, May 21-26, 2006

Co-Chair, MRS Symposium on Silicon Photonics, March, San Francisco, April 17-21, 2006

JOURNAL PUBLICATIONS [CITATIONS:=41,838, H-INDEX:98 (GOOGLE SCHOLAR)]

1. Steven A. Miller, You-Chia Chang, Christopher T. Phare, Min Chul Shin, Moshe Zadka, Samantha P. Roberts, Brian Stern, Xingchen Ji, Aseema Mohanty, Oscar A. Jimenez Gordillo, Utsav D. Dave, and Michal Lipson, "Large-scale optical phased array using a low-power multi-pass silicon photonic platform", *Optica*, vol. 7, pp. 3-6, 2020.
2. A.L. Gaeta, M Lipson, T.J. Kippenberg "Photonic-chip-based frequency combs" *Nature Photonics*, Vol. 13, pp. 158-159, 2019.
3. D. Waldburger, A.S. Mayer, C.G.E. Alfieri, J. Nürnberg, A.R. Johnson, X. Ji, A. Klenner, Y. Okawachi, M. Lipson, A.L. Gaeta, U. Keller "Tightly locked optical frequency comb from a semiconductor disk laser" *Optics Express*, Vol. 27, No. 3, pp. 1786-1797, 2019.
4. Jae K. Jang, Xingchen Ji, Chaitanya Joshi, Yoshitomo Okawachi, Michal Lipson and Alexander L. Gaeta, "Observation of Arnold Tongues in Coupled Soliton Kerr Frequency Combs", American Physical Society, *Phys. Rev. Lett.* 123, 153901, 2019.
5. Sven Ramelow, Alessandro Farsi, Zachary Vernon, Stephane Clemmen, Xingchen Ji, J. E. Sipe, Marco Liscidini, Michal Lipson and Alexander L. Gaeta, "Strong Nonlinear Coupling in a Si₃N₄ Ring Resonator", American Physical Society, *Phys. Rev. Lett.* 122, 153906, 2019.
6. Mohammad Amin Tadayon, Shridha Chaitanya, Kelly Marie Martyniuk, Josephine Cecelia McGowan, Samantha, Pamela Roberts, Christine Ann Denny and Michal Lipson, "3D microphotonic probe for high resolution deep tissue imaging," *Optics Express*, Vol. 27, No.16, pp.22352-22362, 2019.
7. Xingchen Ji, Xinwen Yao, Alexander Klenner, Yu Gan, Alexander L. Gaeta, Christine P. Hendon, and Michal Lipson, "Chip-based frequency comb sources for optical coherence tomography," *Optics Express*, Vol. 14, pp.19896-19905, 2019.
8. Gaurang R. Bhatt, Avik Dutt, Steven A. Miller, Raphael St-Gelais, Felipe A. S. Barbosa, Paulo A. Nussenzveig, and Michal Lipson, "Broadband enhancement of thermal radiation", *Optics Express*, Vol. 27, pp.A818-A828, 2019.
9. Bok Young Kim, Yoshitomo Okawachi, Jae K. Jang, Mengjie Yu, Xingchen Ji, Yun Zhao, Chaitanya Joshi, Michal Lipson, and Alexander L. Gaeta, "Turn-key, high-efficiency Kerr comb source", *Optics Letters*, Vol. 44, pp.4475-4478, 2019.
10. A.P. Schlaus, M. S. Spencer, K. Miyata, F. Liu, X. Wang, I. Datta, M. Lipson, A. Pan and X. Y. Zhu "How lasing happens in CsPbBr₃ perovskite nanowires" *Nature Communications* vol.10, 2019.
11. A. W. Barnard, M. Zhang, G. S. Wiederhecker, M. Lipson, P. L. McEuen " Real-time vibrations of a carbon nanotube" *Nature*, 566, 89–93, 2019.
12. X. Zheng, A. Calo, E. Albisetti, X. Liu, A.S.M. Alharbi, G. Arefe, X. Liu, M. Spieser, W.J. Yoo, T. Taniguchi, K. Watanabe, C.Aruta, A. Ciarrocchi, A. Kis, B. S. Lee, M. Lipson, J. Hone, D. Shahrjerdi and E. Riedo "Patterning metal contacts on monolayer MoS₂ with vanishing Schottky barriers using thermal nanolithography", *Nature Electronics* 2, 17–25, 2019.

13. L. Koehler, P. Chevalier, E. Shim, B. Desiatov, A. Shams-Ansari, M. Piccardo, Y. Okawachi, M. Yu, M. Loncar, M. Lipson, A. L. Gaeta, F. Capasso "Direct thermo-optical tuning of silicon microresonators for the mid-infrared" *Optics Express*, Vol. 26, No. 26, pp. 34965-34976, 2018.
14. B. Stern, X. Ji, Y. Okawachi, A. L. Gaeta, M. Lipson "Battery-operated integrated frequency comb generator" *Nature*, Vol. 562, No. 7727, pp. 401, 2018.
15. Y. Okawachi, M. Yu, J. Cardenas, X. Ji, A. Klenner, M. Lipson, A. L. Gaeta "Carrier envelope offset detection via simultaneous supercontinuum and second-harmonic generation in a silicon nitride waveguide" *Optics letters*, vol.43, No. 19, pp 4627- 4630, 2018.
16. T.J. Kippenberg, A.L. Gaeta, M. Lipson, M.L. Gorodetsky "Dissipative Kerr solitons in optical microresonators" *Science*, Vol. 361, No. pp 6402, 2018.
17. M. A. Tadayon, I. Pavlova, K. M. Martyniuk, A. Mohanty, S. P. Roberts, F. Barbosa, C. A. Denny, M. Lipson "Microphotonic needle for minimally invasive endoscopic imaging with sub-cellular resolution" *Scientific reports*, Vol. 8, No.1, pp 10756, 2018.
18. G. Kovacevic, C. Phare, S.Y. Set, M. Lipson, S. Yamashita, "Ultra-high-speed graphene optical modulator design based on tight field confinement in a slot waveguide" *Applied Physics Express*, Vol. 11, No. 6, pp 065102, 2018.
19. M. Yu, Y. Okawachi, A. G. Griffith, N. Picqué, M. Lipson and A. L. Gaeta, "Silicon-chip-based mid-infrared dual-comb spectroscopy" *Nature Communications*, Vol. 9, 2018.
20. S. Ramelow, A. Farsi, A. Vernon, S. Clemmen, X. Ji, J. E. Sipe, M. Liscidini, M. Lipson and A. L. Gaeta, " Strong Nonlinear Coupling due to induced Photon Interaction on Si₃N₄ Chip" *arXiv:1802.10072*, 2018.
21. C. T. Phare, M. C. Shin, S. a. Miller, B. Stern, and M. Lipson " Silicon Optical Phase Array with high-efficiency Beam Formation over 180 Degree Field of View", *arXiv:1802.04624*, 2018.
22. A. Mohanty, Q. Li, M.A. Tadayon, G. Bhatt, E. Shim, X. Ji, J. Cardenas, S. A. Miller, A. Kepecs, M. Lipson. "A reconfigurable nanophotonics platform for sub-millisecond, deep brain neural stimulation" *arXiv:1805.11663*, 2018.
23. M. Yu, Y. Okawachi, C. Joshi, X. Ji, M. Lipson, and A. L. Gaeta. "Gas-Phase microresonator-based comb spectroscopy without an external pump laser" *ACS Photonics Article ASAP*, 2018.
24. J.K. Jang, A Klenner, X. Ji, Y. Okawachi, M. Lipson, A. L. Gaeta. "Synchronization of coupled optical microresonators" *arXiv:1806.02328*, 2018.
25. M. Zadka, Y. Chang, A. Mohanty, C. T. Phare, S. P. Roberts, and M. Lipson. "On-chip platform for a phased array with minimal beam divergence and wide field-of-view." *Opt. Express* 26, 2528–2534, 2018.
26. A. Dutt, C. Joshi, X. Ji, J. Cardenas, Y. Okawachi, K. Luke, A. L. Gaeta, and M. Lipson. "On-chip dual-comb source for spectroscopy." *Science Advances* 4, no. 3, 2018.
27. C. Joshi, M.Yu, K. Luke, X. Ji, A.Klenner, Y. Okawachi, M. Lipson, and A. L. Gaeta. "Counter-rotating cavity solitons in a silicon nitride microresonator." *Optics Letters* 43, no. 3, 2018.
28. C. Wang, M. Zhang, B. Stern, M. Lipson, and M. Lončar. "Nanophotonic lithium niobate electro-optic modulators." *Optics Express* vol. 26, no. 2, pp. 1547, 2018
29. M. Yu, J. K. Jang, Y. Okawachi, A. G. Griffith, K. Luke, S. A. Miller, X. Ji, M. Lipson, and A. L. Gaeta, "Breather soliton dynamics in microresonators," *Nature Communications*, vol. 8, 2017.
30. B. S. Lee, M. Zhang, F. A. Barbosa, S. A. Miller, A. Mohanty, R. St-Gelais, and M. Lipson, "On-chip thermo-optic tuning of suspended microresonators," *Opt. Express*, vol. 25, no. 11, pp. 12109–12120, 2017.

31. Y. Okawachi, M. Yu, J. Cardenas, X. Ji, M. Lipson, and A. L. Gaeta, "Coherent, directional supercontinuum generation," *Opt. Lett.*, vol. 42, no. 21, pp. 4466–4469, 2017.
32. M. Yu, Y. Okawachi, A. G. Griffith, M. Lipson, and A. L. Gaeta, "Microresonator-based high-resolution gas spectroscopy," *Opt. Lett.*, vol. 42, no. 21, pp. 4442–4445, 2017.
33. A. Mohanty, M. Zhang, A. Dutt, S. Ramelow, P. Nussenzveig, and M. Lipson, "Quantum interference between transverse spatial waveguide modes," *Nature Communications*, vol. 8, p. 14010, 2017.
34. R. St-Gelais, G. R. Bhatt, L. Zhu, S. Fan, and M. Lipson, "Hot Carrier-Based Near-Field Thermophotovoltaic Energy Conversion," *ACS Nano*, vol. 11, no. 3, pp. 3001–3009, 2017.
35. R. Fain, F. Barbosa, J. Cardenas, and M. Lipson, "Photonic Needles for Light Delivery in Deep Tissue-like Media," *Sci. Rep.*, vol. 7, no. 1, p. 5627, 2017.
36. X. Ji, F. A. Barbosa, S. P. Roberts, A. Dutt, J. Cardenas, Y. Okawachi, A. Bryant, A. L. Gaeta, and M. Lipson, "Ultra-low-loss on-chip resonators with sub-milliwatt parametric oscillation threshold," *Optica*, vol. 4, no. 6, pp. 619–624, 2017.
37. B. Stern, X. Ji, A. Dutt, and M. Lipson, "Compact narrow-linewidth integrated laser based on a low-loss silicon nitride ring resonator," *Opt. Lett.*, vol. 42, no. 21, pp. 4541–4544, 2017.
38. B. Zhao, K. Chen, S. Buddhiraju, G. Bhatt, M. Lipson, and S. Fan, "High-performance near-field thermophotovoltaics for waste heat recovery," *Nano Energy*, vol. 41, pp. 344–350, 2017.
39. C. Joshi, J. K. Jang, K. Luke, X. Ji, S. A. Miller, A. Klenner, Y. Okawachi, M. Lipson, and A. L. Gaeta, "Thermally controlled comb generation and soliton modelocking in microresonators," *Opt. Lett.*, vol. 41, no. 11, pp. 2565–2568, 2016.
40. J. K. Jang, Y. Okawachi, M. Yu, K. Luke, X. Ji, M. Lipson, and A. L. Gaeta, "Dynamics of mode-coupling-induced microresonator frequency combs in normal dispersion," *Opt. Express*, vol. 24, no. 25, pp. 28794–28803, 2016.
41. M. Yu, Y. Okawachi, A. G. Griffith, M. Lipson, and A. L. Gaeta, "Mode-locked mid-infrared frequency combs in a silicon microresonator," *Optica*, vol. 3, no. 8, pp. 854–860, 2016.
42. Y. Okawachi, M. Yu, K. Luke, D. O. Carvalho, M. Lipson, and A. L. Gaeta, "Quantum random number generator using a microresonator-based Kerr oscillator," *Opt. Lett.*, vol. 41, no. 18, pp. 4194–4197, 2016.
43. A. Klenner, A. S. Mayer, A. R. Johnson, K. Luke, M. R. Lamont, Y. Okawachi, M. Lipson, A. L. Gaeta, and U. Keller, "Gigahertz frequency comb offset stabilization based on supercontinuum generation in silicon nitride waveguides," *Opt. Express*, vol. 24, no. 10, pp. 11043–11053, 2016.
44. A. S. Mayer, C. R. Phillips, C. Langrock, A. Klenner, A. R. Johnson, K. Luke, Y. Okawachi, M. Lipson, A. L. Gaeta, and M. M. Fejer, "Offset-free gigahertz mid-infrared frequency comb based on optical parametric amplification in a periodically poled lithium niobate waveguide," *Physical Review Applied*, vol. 6, no. 5, p. 054009, 2016.
45. R. St-Gelais, L. Zhu, S. Fan, and M. Lipson, "Near-field radiative heat transfer between parallel structures in the deep subwavelength regime," *Nature Nanotech*, vol. 11, no. 6, pp. 515–519, 2016.
46. A. G. Griffith, M. Yu, Y. Okawachi, J. Cardenas, A. Mohanty, A. L. Gaeta, and M. Lipson, "Coherent mid-infrared frequency combs in silicon-microresonators in the presence of Raman effects," *Opt. Express*, vol. 24, no. 12, pp. 13044–13050, 2016.
47. A. Dutt, S. Miller, K. Luke, J. Cardenas, A. L. Gaeta, P. Nussenzveig, and M. Lipson, "Tunable squeezing using coupled ring resonators on a silicon nitride chip," *Opt. Lett.*, vol. 41, no. 2, pp. 223–226, 2016.
48. A. R. Johnson, A. S. Mayer, A. Klenner, K. Luke, E. S. Lamb, M. R. Lamont, C. Joshi, Y.

- Okawachi, F. W. Wise, and M. Lipson, "Octave-spanning coherent supercontinuum generation in a silicon nitride waveguide," *Opt. Lett.*, vol. 40, no. 21, pp. 5117–5120, 2015.
49. B. Guha and M. Lipson, "Controlling thermo-optic response in microresonators using bimaterial cantilevers," *Opt. Lett.*, vol. 40, no. 1, pp. 103–106, 2015.
 50. M. Zhang, S. Shah, J. Cardenas, and M. Lipson, "Synchronization and phase noise reduction in micromechanical oscillator arrays coupled through light," *Phys. Rev. Lett.*, vol. 115, no. 16, p. 163902, 2015.
 51. S. A. Miller, Y. Okawachi, S. Ramelow, K. Luke, A. Dutt, A. Farsi, A. L. Gaeta, and M. Lipson, "Tunable frequency combs based on dual microring resonators," *Opt. Express*, vol. 23, no. 16, pp. 21527–21540, 2015.
 52. S. L. Mouradian, T. Schröder, C. B. Poitras, L. Li, J. Goldstein, E. H. Chen, M. Walsh, J. Cardenas, M. L. Markham, and D. J. Twitchen, "Scalable integration of long-lived quantum memories into a photonic circuit," *Physical Review X*, vol. 5, no. 3, p. 031009, 2015.
 53. Y. Okawachi, M. Yu, K. Luke, D. O. Carvalho, S. Ramelow, A. Farsi, M. Lipson, and A. L. Gaeta, "Dual-pumped degenerate Kerr oscillator in a silicon nitride microresonator," *Opt. Lett.*, vol. 40, no. 22, pp. 5267–5270, 2015.
 54. K. Luke, Y. Okawachi, M. R. Lamont, A. L. Gaeta, and M. Lipson, "Broadband mid-infrared frequency comb generation in a Si₃N₄ microresonator," *Opt. Lett.*, vol. 40, no. 21, pp. 4823–4826, 2015.
 55. M. Fridman, Y. Okawachi, S. Clemmen, M. Ménard, M. Lipson, and A. L. Gaeta, "Waveguide-based single-shot temporal cross-correlator," *Journal of Optics*, vol. 17, no. 3, p. 035501, 2015.
 56. J. Cardenas, M. Yu, Y. Okawachi, C. B. Poitras, R. K. Lau, A. Dutt, A. L. Gaeta, and M. Lipson, "Optical nonlinearities in high-confinement silicon carbide waveguides," *Opt. Lett.*, vol. 40, no. 17, pp. 4138–4141, 2015.
 57. Stern, X. Zhu, C. P. Chen, L. D. Tzuang, J. Cardenas, K. Bergman, and M. Lipson, "On-chip mode-division multiplexing switch," *Optica*, vol. 2, no. 6, pp. 530–535, 2015.
 58. S. Y. Shah, M. Zhang, R. Rand, and M. Lipson, "Master-slave locking of optomechanical oscillators over a long distance," *Phys. Rev. Lett.*, vol. 114, no. 11, p. 113602, 2015.
 59. C.T. Phare, Y.-H. D. Lee, J. Cardenas, and M. Lipson, "Graphene electro-optic modulator with 30 GHz bandwidth," *Nat Photon*, vol. 9, no. 8, pp. 511–514, 2015.
 60. A. Dutt, K. Luke, S. Manipatruni, A. L. Gaeta, P. Nussenzeig, and M. Lipson, "On-chip optical squeezing," *Physical Review Applied*, vol. 3, no. 4, p. 044005, 2015.
 61. Austin G. Griffith, Ryan K.W. Lau, Jaime Cardenas, Yoshitomo Okawachi, Aseema Mohanty, Romy Fain, Yoon Ho Daniel Lee, Mengjie Yu, Christopher T. Phare, Carl B. Poitras, Alexander L. Gaeta and Michal Lipson, "Silicon-chip mid-infrared frequency comb generation", *Nature Communications* volume 6, 6299 (2015)
 62. A. S. Mayer, A. Klenner, A. R. Johnson, K. Luke, M. Lamont, Y. Okawachi, M. Lipson, A. L. Gaeta, and U. Keller, "Frequency comb offset detection using supercontinuum generation in silicon nitride waveguides," *Opt. Express*, vol. 23, no. 12, pp. 15440–15451, 2015.
 63. J. Cardenas, C. B. Poitras, K. Luke, L.-W. Luo, P. A. Morton, and M. Lipson, "High coupling efficiency etched facet tapers in silicon waveguides," *IEEE Photon. Technol. Lett.*, vol. 26, no. 23, pp. 2380–2382, 2014.
 64. Y. Okawachi, M. R. Lamont, K. Luke, D. O. Carvalho, M. Yu, M. Lipson, and A. L. Gaeta, "Bandwidth shaping of microresonator-based frequency combs via dispersion engineering," *Opt. Lett.*, vol. 39, no. 12, pp. 3535–3538, 2014.
 65. R. K. Lau, M. R. Lamont, A. G. Griffith, Y. Okawachi, M. Lipson, and A. L. Gaeta, "Octave-spanning mid-infrared supercontinuum generation in silicon nanowaveguides," *Opt.*

- Lett.*, vol. 39, no. 15, pp. 4518–4521, 2014.
66. A. R. Johnson, Y. Okawachi, M. R. Lamont, J. S. Levy, M. Lipson, and A. L. Gaeta, “Microresonator-based comb generation without an external laser source,” *Opt. Express*, vol. 22, no. 2, pp. 1394–1401, 2014.
 67. M. Soltani, J. Lin, R. A. Forties, J. T. Inman, S. N. Saraf, R. M. Fulbright, M. Lipson, and M. D. Wang, “Nanophotonic trapping for precise manipulation of biomolecular arrays,” *Nature Nanotech*, vol. 9, no. 6, pp. 448–452, 2014.
 68. R. St-Gelais, B. Guha, L. Zhu, S. Fan, and M. Lipson, “Demonstration of strong near-field radiative heat transfer between integrated nanostructures,” *Nano Lett.*, vol. 14, no. 12, pp. 6971–6975, 2014.
 69. L. D. Tzuang, M. Soltani, Y.-H. D. Lee, and M. Lipson, “High RF carrier frequency modulation in silicon resonators by coupling adjacent free-spectral-range modes,” *Opt. Lett.*, vol. 39, no. 7, pp. 1799–1802, 2014.
 70. L.-W. Luo, N. Ophir, C. P. Chen, L. H. Gabrielli, C. B. Poitras, K. Bergmen, and M. Lipson, “WDM-compatible mode-division multiplexing on a silicon chip,” *Nature Communications*, vol. 5, p. 3069, 2014.
 71. S. Miller, K. Luke, Y. Okawachi, J. Cardenas, A. L. Gaeta, and M. Lipson, “On-chip frequency comb generation at visible wavelengths via simultaneous second- and third-order optical nonlinearities,” *Opt. Express*, vol. 22, no. 22, pp. 26517–26525, 2014.
 72. S. Ramelow, A. Farsi, S. Clemmen, J. S. Levy, A. R. Johnson, Y. Okawachi, M. R. Lamont, M. Lipson, and A. L. Gaeta, “Strong polarization mode coupling in microresonators,” *Opt. Lett.*, vol. 39, no. 17, pp. 5134–5137, 2014.
 73. K. Padmaraju, X. Zhu, L. Chen, M. Lipson, and K. Bergman, “Intermodulation crosstalk characteristics of WDM silicon microring modulators,” *IEEE Photonics Technology Letters*, vol. 26, no. 14, pp. 1478–1481, 2014.
 74. L. D. Tzuang, K. Fang, P. Nussenzeig, S. Fan, and M. Lipson, “Non-reciprocal phase shift induced by an effective magnetic flux for light,” *Nat Photon*, vol. 8, no. 9, pp. 701–705, 2014.
 75. D. Moss, R. Morandotti, A. L. Gaeta, and M. Lipson, “New CMOS-compatible platforms based on silicon nitride and Hydex for nonlinear optics,” *Nat Photon*, vol. 7, no. 8, pp. 597–607, 2013.
 76. J. Cardenas, P. A. Morton, J. B. Khurgin, A. Griffith, C. B. Poitras, K. Preston, and M. Lipson, “Linearized silicon modulator based on a ring assisted Mach Zehnder interferometer,” *Opt. Express*, vol. 21, no. 19, pp. 22549–22557, 2013.
 77. S. Manipatruni, M. Lipson, and I. A. Young, “Device scaling considerations for nanophotonic CMOS global interconnects,” *IEEE J. Select. Topics Quantum Electron.*, vol. 19, no. 2, pp. 8200109–8200109, 2013.
 78. K. Luke, A. Dutt, C. B. Poitras, and M. Lipson, “Overcoming Si₃N₄ film stress limitations for high quality factor ring resonators,” *Opt. Express*, vol. 21, no. 19, pp. 22829–22833, 2013.
 79. J. Cardenas, M. Zhang, C. T. Phare, S. Y. Shah, C. B. Poitras, B. Guha, and M. Lipson, “High Q silicon microresonators,” *Opt. Express*, vol. 21, no. 14, pp. 16882–16887, 2013.
 80. Y.-H. D. Lee and M. Lipson, “Back-end deposited silicon photonics for monolithic integration on CMOS,” *IEEE J. Select. Topics Quantum Electron.*, vol. 19, no. 2, pp. 8200207–8200207, 2013.
 81. Y.-H. D. Lee, M. O. Thompson, and M. Lipson, “Deposited low temperature silicon GHz modulator,” *Opt. Express*, vol. 21, no. 22, pp. 26688–26692, 2013.
 82. B. Guha, J. Cardenas, and M. Lipson, “Athermal silicon microring resonators with titanium oxide cladding,” *Opt. Express*, vol. 21, no. 22, pp. 26557–26563, 2013.
 83. K. Saha, Y. Okawachi, B. Shim, J. S. Levy, R. Salem, A. R. Johnson, M. A. Foster, M. R.

- Lamont, M. Lipson, and A. L. Gaeta, "Modelocking and femtosecond pulse generation in chip-based frequency combs," *Opt. Express*, vol. 21, no. 1, pp. 1335–1343, 2013.
84. A. Liu, L. H. Gabrielli, M. Lipson, and S. G. Johnson, "Transformation inverse design," *Opt. Express*, vol. 21, no. 12, pp. 14223–14243, 2013.
 85. M. Soltani, J. Inman, M. Lipson, and M. D. Wang, "Electro-Optofluidics: Achieving Dynamic Control On-Chip," *Biophysical Journal*, vol. 104, no. 2, p. 503a, 2013.
 86. L. H. Gabrielli, D. Liu, S. G. Johnson, and M. Lipson, "On-chip transformation optics for multimode waveguide bends," *Nature Communications*, vol. 3, p. 1217, 2012.
 87. K. Padmaraju, J. Chan, L. Chen, M. Lipson, and K. Bergman, "Thermal stabilization of a microring modulator using feedback control," *Opt. Express*, vol. 20, no. 27, pp. 27999–28008, 2012.
 88. P. A. Morton, J. Cardenas, J. B. Khurgin, and M. Lipson, "Fast thermal switching of wideband optical delay line with no long-term transient," *IEEE Photon. Technol. Lett.*, vol. 24, no. 6, pp. 512–514, 2012.
 89. A. Griffith, J. Cardenas, C. B. Poitras, and M. Lipson, "High quality factor and high confinement silicon resonators using etchless process," *Opt. Express*, vol. 20, no. 19, pp. 21341–21345, 2012.
 90. L. Xu, Q. Li, N. Ophir, K. Padmaraju, L.-W. Luo, L. Chen, M. Lipson, and K. Bergman, "Colorless optical network unit based on silicon photonic components for WDM PON," *IEEE Photonics Technology Letters*, vol. 24, no. 16, pp. 1372–1374, 2012.
 91. W. Zhang, L. Xu, Q. Li, H. L. Lira, M. Lipson, and K. Bergman, "Broadband silicon photonic packet-switching node for large-scale computing systems," *IEEE Photon. Technol. Lett.*, vol. 24, no. 8, pp. 688–690, 2012.
 92. B. Guha, C. Otey, C. B. Poitras, S. Fan, and M. Lipson, "Near-field radiative cooling of nanostructures," *Nano Lett.*, vol. 12, no. 9, pp. 4546–4550, 2012.
 93. M. Zhang, G. S. Wiederhecker, S. Manipatruni, A. Barnard, P. McEuen, and M. Lipson, "Synchronization of micromechanical oscillators using light," *Phys. Rev. Lett.*, vol. 109, no. 23, p. 233906, 2012.
 94. H. Lira, Z. Yu, S. Fan, and M. Lipson, "Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.-Electrically Driven Nonreciprocity Induced by Interband Photonic Transition on a Silicon Chip 033901," *Phys. Rev. Lett.*, vol. 109, no. 3, 2012.
 95. Y. Yue, H. Huang, L. Zhang, J. Wang, J.-Y. Yang, O. F. Yilmaz, J. S. Levy, M. Lipson, and A. E. Willner, "UWB monocycle pulse generation using two-photon absorption in a silicon waveguide," *Opt. Lett.*, vol. 37, no. 4, pp. 551–553, 2012.
 96. A. R. Johnson, Y. Okawachi, J. S. Levy, J. Cardenas, K. Saha, M. Lipson, and A. L. Gaeta, "Chip-based frequency combs with sub-100 GHz repetition rates," *Opt. Lett.*, vol. 37, no. 5, pp. 875–877, 2012.
 97. Y. Okawachi, A. L. Gaeta, and M. Lipson, "Breakthroughs in nonlinear silicon photonics 2011," *IEEE Photonics J.*, vol. 4, no. 2, pp. 601–606, 2012.
 98. Y. H. Wen, O. Kuzucu, M. Fridman, A. L. Gaeta, L.-W. Luo, and M. Lipson, "All-optical control of an individual resonance in a silicon microresonator," *Phys. Rev. Lett.*, vol. 108, no. 22, p. 223907, 2012.
 99. X. Zhu, Q. Li, J. Chan, A. Ahsan, H. L. Lira, M. Lipson, and K. Bergman, "44 Gb/s Packet-Level Switching in a Second-Order Microring Switch," *IEEE Photonics Technology Letters*, vol. 24, no. 17, pp. 1555–1557, 2012.
 100. M. Soltani, J. T. Inman, M. Lipson, and M. D. Wang, "Electro-optofluidics: achieving dynamic control on-chip," *Opt. Express*, vol. 20, no. 20, pp. 22314–22326, 2012.
 101. H. Lira, Z. Yu, S. Fan, and M. Lipson, "Electrically driven nonreciprocity induced by

- interband photonic transition on a silicon chip," *Phys. Rev. Lett.*, vol. 109, no. 3, p. 033901, 2012.
- A. Guha, K. Preston, and M. Lipson, "Athermal silicon microring electro-optic modulator," *Opt. Lett.*, vol. 37, no. 12, pp. 2253–2255, 2012.
102. N. Ophir, R. K. Lau, M. Ménard, R. Salem, K. Padmaraju, Y. Okawachi, M. Lipson, A. L. Gaeta, and K. Bergman, "First demonstration of a 10-Gb/s RZ end-to-end four-wave-mixing based link at 1884 nm using silicon nanowaveguides," *IEEE Photonics Technology Letters*, vol. 24, no. 4, pp. 276–278, 2012.
103. K. Saha, Y. Okawachi, J. S. Levy, R. K. Lau, K. Luke, M. A. Foster, M. Lipson, and A. L. Gaeta, "Broadband parametric frequency comb generation with a 1- μ m pump source," *Opt. Express*, vol. 20, no. 24, pp. 26935–26941, 2012.
104. R. Halir, Y. Okawachi, J. S. Levy, M. A. Foster, M. Lipson, and A. L. Gaeta, "Ultrabroadband supercontinuum generation in a CMOS-compatible platform," *Opt. Lett.*, vol. 37, no. 10, pp. 1685–1687, 2012.
105. K. Padmaraju, N. Ophir, Q. Xu, B. Schmidt, J. Shakya, S. Manipatruni, M. Lipson, and K. Bergman, "Error-free transmission of microring-modulated BPSK," *Opt. Express*, vol. 20, no. 8, pp. 8681–8688, 2012.
106. N. Ophir, R. K. Lau, M. Ménard, X. Zhu, K. Padmaraju, Y. Okawachi, R. Salem, M. Lipson, A. L. Gaeta, and K. Bergman, "Wavelength conversion and unicast of 10-Gb/s data spanning up to 700 nm using a silicon nanowaveguide," *Opt. Express*, vol. 20, no. 6, pp. 6488–6495, 2012.
107. J. S. Levy, K. Saha, Y. Okawachi, M. A. Foster, A. L. Gaeta, and M. Lipson, "High-performance silicon-nitride-based multiple-wavelength source," *IEEE Photonics Technology Letters*, vol. 24, no. 16, pp. 1375–1377, 2012.
108. Y. Okawachi, O. Kuzucu, M. A. Foster, R. Salem, A. C. Turner-Foster, A. Biberman, N. Ophir, K. Bergman, M. Lipson, and A. L. Gaeta, "Characterization of nonlinear optical crosstalk in silicon nanowaveguides," *IEEE Photonics Technology Letters*, vol. 24, no. 3, pp. 185–187, 2012.
109. L. Xu, W. Zhang, Q. Li, J. Chan, H. L. Lira, M. Lipson, and K. Bergman, "40-Gb/s DPSK data transmission through a silicon microring switch," *IEEE Photonics Technology Letters*, vol. 24, no. 5, p. 473, 2012.
110. L.-W. Luo, G. S. Wiederhecker, J. Cardenas, C. Poitras, and M. Lipson, "High quality factor etchless silicon photonic ring resonators," *Opt. Express*, vol. 19, no. 7, pp. 6284–6289, 2011.
111. Y. H. Wen, O. Kuzucu, T. Hou, M. Lipson, and A. L. Gaeta, "All-optical switching of a single resonance in silicon ring resonators," *Opt. Lett.*, vol. 36, no. 8, pp. 1413–1415, 2011.
112. L. H. Gabrielli and M. Lipson, "Integrated Luneburg lens via ultra-strong index gradient on silicon," *Opt. Express*, vol. 19, no. 21, pp. 20122–20127, 2011.
113. J. T. Robinson and M. Lipson, "Direction-dependent optical modes in nanoscale Silicon waveguides," *Opt. Express*, vol. 19, no. 19, pp. 18380–18392, 2011.
114. Y. Okawachi, K. Saha, J. S. Levy, Y. H. Wen, M. Lipson, and A. L. Gaeta, "Octave-spanning frequency comb generation in a silicon nitride chip," *Opt. Lett.*, vol. 36, no. 17, pp. 3398–3400, 2011.
115. L. Xu, W. Zhang, H. L. Lira, M. Lipson, and K. Bergman, "A hybrid optical packet and wavelength selective switching platform for high-performance data center networks," *Opt. Express*, vol. 19, no. 24, pp. 24258–24267, 2011.
116. G. S. Wiederhecker, S. Manipatruni, S. Lee, and M. Lipson, "Broadband tuning of optomechanical cavities," *Opt. Express*, vol. 19, no. 3, pp. 2782–2790, 2011.

117. D. Olaosebikan, S. Yerci, A. Gondarenko, K. Preston, R. Li, L. Dal Negro, and M. Lipson, "Absorption bleaching by stimulated emission in erbium-doped silicon-rich silicon nitride waveguides," *Opt. Lett.*, vol. 36, no. 1, pp. 4–6, 2011.
118. A. Nitkowski, A. Baeumner, and M. Lipson, "On-chip spectrophotometry for bioanalysis using microring resonators," *Biomed. Opt. Express*, *BOE*, vol. 2, no. 2, pp. 271–277, 2011.
119. A. Biberman, H. L. Lira, K. Padmaraju, N. Ophir, J. Chan, M. Lipson, and K. Bergman, "Broadband silicon photonic electrooptic switch for photonic interconnection networks," *IEEE Photonics Technology Letters*, vol. 23, no. 5, p. 504, 2011.
120. M. A. Foster, J. S. Levy, O. Kuzucu, K. Saha, M. Lipson, and A. L. Gaeta, "Silicon-based monolithic optical frequency comb source," *Opt. Express*, vol. 19, no. 15, pp. 14233–14239, 2011.
121. L. Xu, K. Padmaraju, L. Chen, M. Lipson, and K. Bergman, "10-Gb/s access network architecture based on micro-ring modulators with colorless ONU and mitigated Rayleigh backscattering," *IEEE Photonics Technology Letters*, vol. 23, no. 13, pp. 914–916, 2011.
122. H. L. Lira, C. B. Poitras, and M. Lipson, "CMOS compatible reconfigurable filter for high bandwidth non-blocking operation," *Opt. Express*, vol. 19, no. 21, pp. 20115–20121, 2011.
123. N. Sherwood-Droz and M. Lipson, "Scalable 3D dense integration of photonics on bulk silicon," *Opt. Express*, vol. 19, no. 18, pp. 17758–17765, 2011.
124. L. Xu, N. Ophir, M. Ménard, R. K. W. Lau, A. C. Turner-Foster, M. A. Foster, M. Lipson, A. L. Gaeta, and K. Bergman, "Simultaneous wavelength conversion of ASK and DPSK signals based on four-wave-mixing in dispersion engineered silicon waveguides," *Opt. Express*, vol. 19, no. 13, pp. 12172–12179, 2011.
125. N. Ophir, J. Chan, K. Padmaraju, A. Biberman, A. C. Foster, M. A. Foster, M. Lipson, A. L. Gaeta, and K. Bergman, "Continuous wavelength conversion of 40-Gb/s data over 100 nm using a dispersion-engineered silicon waveguide," *IEEE Photonics Technology Letters*, vol. 23, no. 2, pp. 73–75, 2011.
126. J. S. Levy, M. A. Foster, A. L. Gaeta, and M. Lipson, "Harmonic generation in silicon nitride ring resonators," *Opt. Express*, vol. 19, no. 12, pp. 11415–11421, 2011.
127. R. K. Lau, M. Ménard, Y. Okawachi, M. A. Foster, A. C. Turner-Foster, R. Salem, M. Lipson, and A. L. Gaeta, "Continuous-wave mid-infrared frequency conversion in silicon nanowaveguides," *Opt. Lett.*, vol. 36, no. 7, pp. 1263–1265, 2011.
128. L. Xu, J. Chan, A. Biberman, H. L. Lira, M. Lipson, and K. Bergman, "DPSK transmission through silicon microring switch for photonic interconnection networks," *IEEE Photonics Technology Letters*, vol. 23, no. 16, pp. 1103–1105, 2011.
129. K. Preston, Y.-H. D. Lee, M. Zhang, and M. Lipson, "Waveguide-integrated telecom-wavelength photodiode in deposited silicon," *Opt. Lett.*, vol. 36, no. 1, pp. 52–54, 2011.
130. S. Manipatruni, K. Preston, L. Chen, and M. Lipson, "Ultra-low voltage, ultra-small mode volume silicon microring modulator," *Opt. Express*, vol. 18, no. 17, pp. 18235–18242, 2010.
131. B. Guha, A. Gondarenko, and M. Lipson, "Minimizing temperature sensitivity of silicon Mach-Zehnder interferometers," *Opt. Express*, vol. 18, no. 3, pp. 1879–1887, 2010.
132. J. Cardenas, M. A. Foster, N. Sherwood-Droz, C. B. Poitras, H. L. Lira, B. Zhang, A. L. Gaeta, J. B. Khurgin, P. Morton, and M. Lipson, "Wide-bandwidth continuously tunable optical delay line using silicon microring resonators," *Opt. Express*, vol. 18, no. 25, pp. 26525–26534, 2010.
133. L.-W. Luo, S. Ibrahim, A. Nitkowski, Z. Ding, C. B. Poitras, S. B. Yoo, and M. Lipson, "High bandwidth on-chip silicon photonic interleaver," *Opt. Express*, vol. 18, no. 22, pp. 23079–23087, 2010.

134. A. C. Turner-Foster, M. A. Foster, J. S. Levy, C. B. Poitras, R. Salem, A. L. Gaeta, and M. Lipson, "Ultrashort free-carrier lifetime in low-loss silicon nanowaveguides," *Opt. Express*, vol. 18, no. 4, pp. 3582–3591, 2010.
135. N. Sherwood-Droz, A. Gondarenko, and M. Lipson, "Oxidized silicon-on-insulator (OxSOI) from bulk silicon: a new photonic platform," *Opt. Express*, vol. 18, no. 6, pp. 5785–5790, 2010.
136. D. H. Spadoti, L. H. Gabrielli, C. B. Poitras, and M. Lipson, "Focusing light in a curved-space," *Opt. Express*, vol. 18, no. 3, pp. 3181–3186, 2010.
137. A. C. Turner-Foster, M. A. Foster, R. Salem, A. L. Gaeta, and M. Lipson, "Frequency conversion over two-thirds of an octave in silicon nanowaveguides," *Opt. Express*, vol. 18, no. 3, pp. 1904–1908, 2010.
138. A. Biberman, B. G. Lee, A. C. Turner-Foster, M. A. Foster, M. Lipson, A. L. Gaeta, and K. Bergman, "Wavelength multicasting in silicon photonic nanowires," *Opt. Express*, vol. 18, no. 17, pp. 18047–18055, 2010.
139. A. Nitkowski, A. Gondarenko, and M. Lipson, "On-chip supercontinuum optical trapping and resonance excitation of microspheres," *Opt. Lett.*, vol. 35, no. 10, pp. 1626–1628, 2010.
140. B. Kyotoku, L. Chen, and M. Lipson, "Sub-nm resolution cavity enhanced micro-spectrometer," *Opt. Express*, vol. 18, no. 1, pp. 102–107, 2010.
141. A. Biberman, S. Manipatruni, N. Ophir, L. Chen, M. Lipson, and K. Bergman, "First demonstration of long-haul transmission using silicon microring modulators," *Opt. Express*, vol. 18, no. 15, pp. 15544–15552, 2010.
142. J. S. Levy, A. Gondarenko, M. A. Foster, A. C. Turner-Foster, A. L. Gaeta, and M. Lipson, "CMOS-compatible multiple-wavelength oscillator for on-chip optical interconnects," *Nat Photon*, vol. 4, no. 1, pp. 37–40, 2010.
143. Guha, B. B. Kyotoku, and M. Lipson, "CMOS-compatible athermal silicon microring resonators," *Opt. Express*, vol. 18, no. 4, pp. 3487–3493, 2010.
144. H. Broaddus, M. A. Foster, O. Kuzucu, A. C. Turner-Foster, K. W. Koch, M. Lipson, and A. L. Gaeta, "Temporal-imaging system with simple external-clock triggering," *Opt. Express*, vol. 18, no. 13, pp. 14262–14269, 2010.
145. S. Manipatruni, L. Chen, and M. Lipson, "Ultra high bandwidth WDM using silicon microring modulators," *Opt. Express*, vol. 18, no. 16, pp. 16858–16867, 2010.
146. Y. Dai, Y. Okawachi, A. C. Turner-Foster, M. Lipson, A. L. Gaeta, and C. Xu, "Ultralong continuously tunable parametric delays via a cascading discrete stage," *Opt. Express*, vol. 18, no. 1, pp. 333–339, 2010.
147. L. H. Gabrielli and M. Lipson, "Transformation optics on a silicon platform," *Journal of Optics*, vol. 13, no. 2, p. 024010, 2010.
148. A. Biberman, B. G. Lee, N. Sherwood-Droz, M. Lipson, and K. Bergman, "Broadband operation of nanophotonic router for silicon photonic networks-on-chip," *IEEE Photonics Technology Letters*, vol. 22, no. 12, pp. 926–928, 2010.
149. R. Salem, M. A. Foster, A. C. Turner-Foster, D. F. Geraghty, M. Lipson, and A. L. Gaeta, "High-speed optical sampling using a silicon-chip temporal magnifier," *Opt. Express*, vol. 17, no. 6, pp. 4324–4329, 2009.
150. K. Preston and M. Lipson, "Slot waveguides with polycrystalline silicon for electrical injection," *Opt. Express*, vol. 17, no. 3, pp. 1527–1534, 2009.
151. K. Preston, S. Manipatruni, A. Gondarenko, C. B. Poitras, and M. Lipson, "Deposited silicon high-speed integrated electro-optic modulator," *Opt. Express*, vol. 17, no. 7, pp. 5118–5124, 2009.
152. L. Chen and M. Lipson, "Ultra-low capacitance and high speed germanium

- photodetectors on silicon," *Opt. Express*, vol. 17, no. 10, pp. 7901–7906, 2009.
153. H. L. Lira, S. Manipatruni, and M. Lipson, "Broadband hitless silicon electro-optic switch for on-chip optical networks," *Opt. Express*, vol. 17, no. 25, pp. 22271–22280, 2009.
 154. Y. Dai, X. Chen, Y. Okawachi, A. C. Turner-Foster, M. A. Foster, M. Lipson, A. L. Gaeta, and C. Xu, "1 μ s tunable delay using parametric mixing and optical phase conjugation in Si waveguides," *Opt. Express*, vol. 17, no. 9, pp. 7004–7010, 2009.
 155. W. Syed, D. A. Hammer, and M. Lipson, "Study of nanosecond pulsed magnetic fields using temporally resolved Faraday rotation through a magneto-optical waveguide," *Opt. Lett.*, vol. 34, no. 7, pp. 1009–1011, 2009.
 156. Y. Okawachi, R. Salem, M. A. Foster, A. C. Turner-Foster, M. Lipson, and A. L. Gaeta, "High-resolution spectroscopy using a frequency magnifier," *Opt. Express*, vol. 17, no. 7, pp. 5691–5697, 2009.
 157. P. Dong, L. Chen, Q. Xu, and M. Lipson, "On-chip generation of high-intensity short optical pulses using dynamic microcavities," *Opt. Lett.*, vol. 34, no. 15, pp. 2315–2317, 2009.
 158. B. G. Lee, A. Biberman, N. Sherwood-Droz, C. B. Poitras, M. Lipson, and K. Bergman, "High-Speed 2 \times 2 Switch for Multiwavelength Silicon-Photonic Networks-On-Chip," *Journal of Lightwave Technology*, vol. 27, no. 14, pp. 2900–2907, 2009.
 159. J. Cardenas, C. B. Poitras, J. T. Robinson, K. Preston, L. Chen, and M. Lipson, "Low loss etchless silicon photonic waveguides," *Opt. Express*, vol. 17, no. 6, pp. 4752–4757, 2009.
 160. S. Manipatruni, J. T. Robinson, and M. Lipson, "Optical nonreciprocity in optomechanical structures," *Phys. Rev. Lett.*, vol. 102, no. 21, p. 213903, 2009.
 161. D. Broaddus, M. A. Foster, I. H. Agha, J. T. Robinson, M. Lipson, and A. L. Gaeta, "Silicon-waveguide-coupled high-Q chalcogenide microspheres," *Opt. Express*, vol. 17, no. 8, pp. 5998–6003, 2009.
 162. A. Gondarenko, J. S. Levy, and M. Lipson, "High confinement micron-scale silicon nitride high Q ring resonator," *Opt. Express*, vol. 17, no. 14, pp. 11366–11370, 2009.
 163. O. Kuzucu, Y. Okawachi, R. Salem, M. A. Foster, A. C. Turner-Foster, M. Lipson, and A. L. Gaeta, "Spectral phase conjugation via temporal imaging," *Opt. Express*, vol. 17, no. 22, pp. 20605–20614, 2009.
 164. L. Chen, K. Preston, S. Manipatruni, and M. Lipson, "Integrated GHz silicon photonic interconnect with micrometer-scale modulators and detectors," *Opt. Express*, vol. 17, no. 17, pp. 15248–15256, 2009.
 165. L. H. Gabrielli, J. Cardenas, C. B. Poitras, and M. Lipson, "Silicon nanostructure cloak operating at optical frequencies," *Nat Photon*, vol. 3, no. 8, pp. 461–463, 2009.
 166. Y. Dai, X. Chen, Y. Okawachi, A. C. Turner-Foster, M. A. Foster, M. Lipson, A. L. Gaeta, and C. Xu, "1 μ s tunable delay using parametric mixing and optical phase conjugation in Si waveguides: reply," *Opt. Express*, vol. 17, no. 18, pp. 16029–16031, 2009.
 167. M. A. Foster, R. Salem, Y. Okawachi, A. C. Turner-Foster, M. Lipson, and A. L. Gaeta, "Ultrafast waveform compression using a time-domain telescope," *Nat Photon*, vol. 3, no. 10, pp. 581–585, 2009.
 168. Y. H. Yang, S. D. Moore, B. S. Schmidt, M. Klug, M. Lipson, and D. Erickson, "Optical manipulation of nanoparticles and biomolecules in sub-wavelength slot waveguides," *Nature*, vol. 457, no. 7225, pp. 71–75, 2009.
 169. B. G. Lee, A. Biberman, A. C. Turner-Foster, M. A. Foster, M. Lipson, A. L. Gaeta, and K. Bergman, "Demonstration of broadband wavelength conversion at 40 Gb/s in silicon waveguides," *IEEE Photonics Technology Letters*, vol. 21, no. 3, pp. 182–184, 2009.
 170. M. Lipson, "Silicon photonics: the optical spice rack," *Electronics letters*, vol. 45, no. 12, pp. 576–578, 2009.

171. G. S. Wiederhecker, L. Chen, A. Gondarenko, and M. Lipson, "Controlling photonic structures using optical forces," *Nature*, vol. 462, no. 7273, pp. 633–636, 2009.
172. J.T. Robinson, K. Preston, O. Painter, and M. Lipson, "First-principle derivation of gain in high-index-contrast waveguides," *Opt. Express*, vol. 16, no. 21, pp. 16659–16669, 2008.
173. Y. Okawachi, M. A. Foster, X. Chen, A. C. Turner-Foster, R. Salem, M. Lipson, C. Xu, and A. L. Gaeta, "Large tunable delays using parametric mixing and phase conjugation in Si nanowaveguides," *Opt. Express*, vol. 16, no. 14, pp. 10349–10357, 2008.
174. S. Manipatruni, C. B. Poitras, Q. Xu, and M. Lipson, "High-speed electro-optic control of the optical quality factor of a silicon microcavity," *Opt. Lett.*, vol. 33, no. 15, pp. 1644–1646, 2008.
175. B. G. Lee, A. Biberman, P. Dong, M. Lipson, and K. Bergman, "All-optical comb switch for multiwavelength message routing in silicon photonic networks," *IEEE Photonics Technology Letters*, vol. 20, no. 10, pp. 767–769, 2008.
176. A. Gondarenko and M. Lipson, "Low modal volume dipole-like dielectric slab resonator," *Opt. Express*, vol. 16, no. 22, pp. 17689–17694, 2008.
177. S. Manipatruni, P. Dong, Q. Xu, and M. Lipson, "Tunable superluminal propagation on a silicon microchip," *Opt. Lett.*, vol. 33, no. 24, pp. 2928–2930, 2008.
178. J. T. Robinson, L. Chen, and M. Lipson, "On-chip gas detection in silicon optical microcavities," *Opt. Express*, vol. 16, no. 6, pp. 4296–4301, 2008.
179. P. Dong, S. F. Preble, J. T. Robinson, S. Manipatruni, and M. Lipson, "Inducing photonic transitions between discrete modes in a silicon optical microcavity," *Phys. Rev. Lett.*, vol. 100, no. 3, p. 033904, 2008.
180. A. C. Turner, M. A. Foster, A. L. Gaeta, and M. Lipson, "Ultra-low power parametric frequency conversion in a silicon microring resonator," *Opt. Express*, vol. 16, no. 7, pp. 4881–4887, 2008.
181. A. Foster, R. Salem, D. F. Geraghty, A. C. Turner-Foster, M. Lipson, and A. L. Gaeta, "Silicon-chip-based ultrafast optical oscilloscope," *Nature*, vol. 456, no. 7218, pp. 81–84, 2008.
182. R. Salem, M. A. Foster, A. C. Turner, D. F. Geraghty, M. Lipson, and A. L. Gaeta, "Optical time lens based on four-wave mixing on a silicon chip," *Opt. Lett.*, vol. 33, no. 10, pp. 1047–1049, 2008.
183. A. Foster, A. C. Turner, M. Lipson, and A. L. Gaeta, "Nonlinear optics in photonic nanowires," *Opt. Express*, vol. 16, no. 2, pp. 1300–1320, 2008.
184. J. T. Robinson and M. Lipson, "Far-field control of radiation from an individual optical nanocavity: Analogue to an optical dipole," *Phys. Rev. Lett.*, vol. 100, no. 4, p. 043902, 2008.
185. K. Preston, P. Dong, B. Schmidt, and M. Lipson, "High-speed all-optical modulation using polycrystalline silicon microring resonators," *Appl. Phys. Lett.*, vol. 92, no. 15, p. 151104, 2008.
186. R. Salem, M. A. Foster, A. C. Turner, D. F. Geraghty, M. Lipson, and A. L. Gaeta, "Signal regeneration using low-power four-wave mixing on silicon chip," *Nat Photon*, vol. 2, no. 1, pp. 35–38, 2008.
187. Y. H. Yang, S. D. Moore, B. S. Schmidt, M. Klug, M. Lipson, and D. Erickson, "Optical manipulation of nanoparticles and biomolecules in sub-wavelength slot waveguides," *Nature*, vol. 457, no. 7225, pp. 71–75, 2009.
188. A. Nitkowski, L. Chen, and M. Lipson, "Cavity-enhanced on-chip absorption spectroscopy using microring resonators," *Opt. Express*, vol. 16, no. 16, pp. 11930–11936, 2008.

189. L. Chen, P. Dong, and M. Lipson, "High performance germanium photodetectors integrated on submicron silicon waveguides by low temperature wafer bonding," *Opt. Express*, vol. 16, no. 15, pp. 11513–11518, 2008.
190. K. Preston, B. Schmidt, and M. Lipson, "Polysilicon photonic resonators for large-scale 3D integration of optical networks," *Opt. Express*, vol. 15, no. 25, pp. 17283–17290, 2007.
191. A. Foster, A. C. Turner, R. Salem, M. Lipson, and A. L. Gaeta, "Broad-band continuous-wave parametric wavelength conversion in silicon nanowaveguides," *Opt. Express*, vol. 15, no. 20, pp. 12949–12958, 2007.
192. S. Manipatruni, Q. Xu, B. Schmidt, J. Shakya, and M. Lipson, "High speed carrier injection 18 Gb/s silicon micro-ring electro-optic modulator," pp. 537–538, 2007.
193. B. G. Lee, B. A. Small, Q. Xu, M. Lipson, and K. Bergman, "Characterization of a 4 \times 4 Gb/s Parallel Electronic Bus to WDM Optical Link Silicon Photonic Translator," *IEEE Photonics Technology Letters*, vol. 19, no. 7, pp. 456–458, 2007.
194. B. Schmidt, Q. Xu, J. Shakya, S. Manipatruni, and M. Lipson, "Compact electro-optic modulator on silicon-on-insulator substrates using cavities with ultra-small modal volumes," *Opt. Express*, vol. 15, no. 6, pp. 3140–3148, 2007.
195. P. Dong, S. F. Preble, and M. Lipson, "All-optical compact silicon comb switch," *Opt. Express*, vol. 15, no. 15, pp. 9600–9605, 2007.
196. R. Salem, M. A. Foster, A. C. Turner, D. F. Geraghty, M. Lipson, and A. L. Gaeta, "All-optical regeneration on a silicon chip," *Opt. Express*, vol. 15, no. 12, pp. 7802–7809, 2007.
197. L. Chen, N. Sherwood-Droz, and M. Lipson, "Compact bandwidth-tunable microring resonators," *Opt. Lett.*, vol. 32, no. 22, pp. 3361–3363, 2007.
198. S. F. Preble, Q. Xu, and M. Lipson, "Changing the colour of light in a silicon resonator," *Nat Photon*, vol. 1, no. 5, pp. 293–296, 2007.
199. Q. Xu, S. Manipatruni, B. Schmidt, J. Shakya, and M. Lipson, "12.5 Gbit/s carrier-injection-based silicon micro-ring silicon modulators," *Opt. Express*, vol. 15, no. 2, pp. 430–436, 2007.
200. Q. Xu and M. Lipson, "All-optical logic based on silicon micro-ring resonators," *Opt. Express*, vol. 15, no. 3, pp. 924–929, 2007.
201. S. Manipatruni, Q. Xu, and M. Lipson, "PINIP based high-speed high-extinction ratio micron-size silicon electro-optic modulator," *Opt. Express*, vol. 15, no. 20, pp. 13035–13042, 2007.
202. Q. Xu, P. Dong, and M. Lipson, "Breaking the delay-bandwidth limit in a photonic structure," *Nature Physics*, vol. 3, no. 6, pp. 406–410, 2007.
203. B. S. Schmidt, A. H. Yang, D. Erickson, and M. Lipson, "Optofluidic trapping and transport on solid core waveguides within a microfluidic device," *Opt. Express*, vol. 15, no. 22, pp. 14322–14334, 2007.
204. A. Gondarenko, S. Preble, J. Robinson, L. Chen, H. Lipson, and M. Lipson, "Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.-Spontaneous Emergence of Periodic Patterns in a Biologically Inspired Simulation of Photonic Structures," *Phys. Rev. Lett.*, vol. 96, no. 14, pp. 143904–144100, 2006.
205. L. Chen, J. Shakya, and M. Lipson, "Subwavelength confinement in an integrated metal slot waveguide on silicon," *Opt. Lett.*, vol. 31, no. 14, pp. 2133–2135, 2006.
206. B. G. Lee, B. A. Small, K. Bergman, Q. Xu, and M. Lipson, "Transmission of high-data-rate optical signals through a micrometer-scale silicon ring resonator," *Opt. Lett.*, vol. 31, no. 18, pp. 2701–2703, 2006.
207. A. Gondarenko, S. Preble, J. Robinson, L. Chen, H. Lipson, and M. Lipson,

- “Spontaneous emergence of periodic patterns in a biologically inspired simulation of photonic structures,” *Phys. Rev. Lett.*, vol. 96, no. 14, p. 143904, 2006.
208. Y. Okawachi, M. A. Foster, J. E. Sharping, A. L. Gaeta, Q. Xu, and M. Lipson, “All-optical slow-light on a photonic chip,” *Opt. Express*, vol. 14, no. 6, pp. 2317–2322, 2006.
209. L. Guo, T. D. Krauss, C. B. Poitras, M. Lipson, X. Teng, and H. Yang, “Energy transfer between colloidal semiconductor nanocrystals in an optical microcavity,” *Appl. Phys. Lett.*, vol. 89, no. 6, p. 061104, 2006.
210. M. Lipson, “Compact electro-optic modulators on a silicon chip,” *IEEE J. Select. Topics Quantum Electron.*, vol. 12, no. 6, pp. 1520–1526, 2006.
211. C. Manolatu and M. Lipson, “All-optical silicon modulators based on carrier injection by two-photon absorption,” *Journal of Lightwave Technology*, vol. 24, no. 3, p. 1433, 2006.
212. L. Martinez and M. Lipson, “High confinement suspended micro-ring resonators in silicon-on-insulator,” *Opt. Express*, vol. 14, no. 13, pp. 6259–6263, 2006.
213. J. E. Sharping, K. F. Lee, M. A. Foster, A. C. Turner, B. S. Schmidt, M. Lipson, A. L. Gaeta, and P. Kumar, “Generation of correlated photons in nanoscale silicon waveguides,” *Opt. Express*, vol. 14, no. 25, pp. 12388–12393, 2006.
214. A. C. Turner, C. Manolatu, B. S. Schmidt, M. Lipson, M. A. Foster, J. E. Sharping, and A. L. Gaeta, “Tailored anomalous group-velocity dispersion in silicon channel waveguides,” *Opt. Express*, vol. 14, no. 10, pp. 4357–4362, 2006.
215. C. B. Poitras, H. Wu, A. C. Turner, M. G. Spencer, and M. Lipson, “Luminescence dynamics and waveguide applications of europium doped gallium nitride powder,” *Appl. Phys. Lett.*, vol. 89, no. 11, p. 111912, 2006.
216. Q. Xu, S. Sandhu, M. L. Povinelli, J. Shakya, S. Fan, and M. Lipson, “Experimental realization of an on-chip all-optical analogue to electromagnetically induced transparency,” *Phys. Rev. Lett.*, vol. 96, no. 12, p. 123901, 2006.
217. Q. Xu, S. Sandhu, M. L. Povinelli, J. Shakya, S. Fan, and M. Lipson, “Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.-Experimental Realization of an On-Chip All-Optical Analogue to Electromagnetically Induced Transparency,” *Phys. Rev. Lett.*, vol. 96, no. 12, pp. 123901–123901, 2006.
218. Q. Xu and M. Lipson, “Carrier-induced optical bistability in silicon ring resonators,” *Opt. Lett.*, vol. 31, no. 3, pp. 341–343, 2006.
219. C. A. Barrios and M. Lipson, “Silicon photonic read-only memory,” *Journal of Lightwave Technology*, vol. 24, no. 7, p. 2898, 2006.
220. M. A. Foster, A. C. Turner, J. E. Sharping, B. S. Schmidt, M. Lipson, and A. L. Gaeta, “Broad-band optical parametric gain on a silicon photonic chip,” *Nature*, vol. 441, no. 7096, pp. 960–963, 2006.
221. J. A. DeFranco, B. S. Schmidt, M. Lipson, and G. G. Malliaras, “Photolithographic patterning of organic electronic materials,” *Organic Electronics*, vol. 7, no. 1, pp. 22–28, 2006.
222. J. T. Robinson, S. F. Preble, and M. Lipson, “Imaging highly confined modes in sub-micron scale silicon waveguides using Transmission-based Near-field Scanning Optical Microscopy,” *Opt. Express*, vol. 14, no. 22, pp. 10588–10595, 2006.
223. L. Chen, J. T. Robinson, and M. Lipson, “Role of radiation and surface plasmon polaritons in the optical interactions between a nano-slit and a nano-groove on a metal surface,” *Opt. Express*, vol. 14, no. 26, pp. 12629–12636, 2006.
224. H. Wu, C. B. Poitras, M. Lipson, M. G. Spencer, J. Hunting, and F. J. DiSalvo, “Photoluminescence and cathodoluminescence analyses of GaN powder doped with Eu,” *Appl. Phys. Lett.*, vol. 88, no. 1, p. 011921, 2006.

225. Q. Xu, B. Schmidt, J. Shakya, and M. Lipson, "Cascaded silicon micro-ring modulators for WDM optical interconnection," *Opt. Express*, vol. 14, no. 20, pp. 9431–9436, 2006.
226. P. A. Anderson, B. S. Schmidt, and M. Lipson, "High confinement in silicon slot waveguides with sharp bends," *Opt. Express*, vol. 14, no. 20, pp. 9197–9202, 2006.
227. C.A. Barrios, V. R. Almeida, R. R. Panepucci, B. S. Schmidt, and M. Lipson, "Compact silicon tunable Fabry-Perot resonator with low power consumption," *IEEE Photonics Technology Letters*, vol. 16, no. 2, pp. 506–508, 2004.
228. V. R. Almeida, C. A. Barrios, R. R. Panepucci, and M. Lipson, "All-optical control of light on a silicon chip," *Nature*, vol. 431, no. 7012, pp. 1081–1084, 2004.
229. M. Lipson, "Switching light on a silicon chip," *Optical Materials*, vol. 27, no. 5, pp. 731–739, 2005.
230. V. R. Almeida and M. Lipson, "Optical bistability on a silicon chip," *Opt. Lett.*, vol. 29, no. 20, pp. 2387–2389, 2004.
231. M. Lipson, "Guiding, modulating, and emitting light on silicon-challenges and opportunities," *Journal of Lightwave Technology*, vol. 23, no. 12, pp. 4222–4238, 2005.
232. J. T. Robinson, C. Manolatu, L. Chen, and M. Lipson, "Ultrasmall mode volumes in dielectric optical microcavities," *Phys. Rev. Lett.*, vol. 95, no. 14, p. 143901, 2005.
233. P. Preble, M. Lipson, and H. Lipson, "Two-dimensional photonic crystals designed by evolutionary algorithms," *Appl. Phys. Lett.*, vol. 86, no. 6, p. 061111, 2005.
234. P.F. Preble, Q. Xu, B. S. Schmidt, and M. Lipson, "Ultrafast all-optical modulation on a silicon chip," *Opt. Lett.*, vol. 30, no. 21, pp. 2891–2893, 2005.
235. B. Schmidt, V. Almeida, C. Manolatu, S. Preble, and M. Lipson, "Nanocavity in a silicon waveguide for ultrasensitive nanoparticle detection," *Appl. Phys. Lett.*, vol. 85, no. 21, pp. 4854–4856, 2004.
236. Q. Xu, V. R. Almeida, R. R. Panepucci, and M. Lipson, "Experimental demonstration of guiding and confining light in nanometer-size low-refractive-index material," *Opt. Lett.*, vol. 29, no. 14, pp. 1626–1628, 2004.
237. Q. Xu, V. R. Almeida, and M. Lipson, "Demonstration of high Raman gain in a submicrometer-size silicon-on-insulator waveguide," *Opt. Lett.*, vol. 30, no. 1, pp. 35–37, 2005.
238. V.R. Almeida, Q. Xu, C. A. Barrios, and M. Lipson, "Guiding and confining light in void nanostructure," *Opt. Lett.*, vol. 29, no. 11, pp. 1209–1211, 2004.
239. Q. Xu, V. R. Almeida, and M. Lipson, "Micrometer-scale all-optical wavelength converter on silicon," *Opt. Lett.*, vol. 30, no. 20, pp. 2733–2735, 2005.
240. V.R. Almeida, Q. Xu, and M. Lipson, "Ultrafast integrated semiconductor optical modulator based on the plasma-dispersion effect," *Opt. Lett.*, vol. 30, no. 18, pp. 2403–2405, 2005.
241. Q. Xu, B. Schmidt, S. Pradhan, and M. Lipson, "Micrometre-scale silicon electro-optic modulator," *Nature*, vol. 435, no. 7040, pp. 325–327, 2005.
242. C.A. Barrios and M. Lipson, "Electrically driven silicon resonant light emitting device based on slot-waveguide," *Opt. Express*, vol. 13, no. 25, pp. 10092–10101, 2005.
243. H. Wu, C. B. Poitras, M. Lipson, M. G. Spencer, J. Hunting, and F. J. DiSalvo, "Green emission from Er-doped GaN powder," *Appl. Phys. Lett.*, vol. 86, no. 19, p. 191918, 2005.
244. S. Saini, K. Chen, X. Duan, J. Michel, L. C. Kimerling, and M. Lipson, "Er₂O₃ for high-gain waveguide amplifiers," *Journal of electronic materials*, vol. 33, no. 7, pp. 809–814, 2004.
245. M. Lipson, "Overcoming the limitations of microelectronics using Si nanophotonics: solving the coupling, modulation and switching challenges," *Nanotechnology*, vol. 15, no. 10,

p. S622, 2004.

246. Q. Xu, V. R. Almeida, and M. Lipson, "Time-resolved study of Raman gain in highly confined silicon-on-insulator waveguides," *Opt. Express*, vol. 12, no. 19, pp. 4437–4442, 2004.
247. V.R. Almeida, R. R. Panepucci, and M. Lipson, "Nanotaper for compact mode conversion," *Opt. Lett.*, vol. 28, no. 15, pp. 1302–1304, 2003.
248. CA. Barrios, V. R. de Almeida, and M. Lipson, "Low-power-consumption short-length and high-modulation-depth silicon electrooptic modulator," *Journal of Lightwave Technology*, vol. 21, no. 4, p. 1089, 2003.
249. M. Lipson and L. C. Kimerling, "Er 3+ in strong light-confining microcavity," *Appl. Phys. Lett.*, vol. 77, no. 8, pp. 1150–1152, 2000.
250. C.A. Barrios, V. R. Almeida, R. Panepucci, and M. Lipson, "Electrooptic modulation of silicon-on-insulator submicrometer-size waveguide devices," *Journal of Lightwave Technology*, vol. 21, no. 10, p. 2332, 2003.
251. C. B. Poitras, M. Lipson, H. Du, M. A. Hahn, and T. D. Krauss, "Photoluminescence enhancement of colloidal quantum dots embedded in a monolithic microcavity," *Appl. Phys. Lett.*, vol. 82, no. 23, pp. 4032–4034, 2003.

TEXTBOOKS AND CHAPTERS

Gregorkiewickz, T., Fujiwara, Y., Lipson, M., and Zavada, J. Editor(s), Rare earth doping for optoelectronic applications, MRS Symposium Proceedings, 866 Spring 2005.

Lipson, M., Barbastathis, G., Dutta, A.K., and Asakawa, K., Editor(s), Nanophotonics for communication: materials and devices, Proceedings of SPIE, Vol 5597, Oct. 2004.

Pollock, C., and Lipson, M., Integrated Photonics, Kluwer Academic Publishers, Boston, MA, Nov. 2003, ISBN 1402076355.

SELECTED KEYNOTE AND PLENARY TALKS

Max Planck-New York Center for Nonequilibrium Quantum Phenomena: Signing Ceremony, Symposium and Workshop, November 19-20, New York (**Plenary**)

SBFoton International Optics and Photonics Conference 2019, "Photonics on Chip", São Paulo, Brazil, October 7-10, 2019 (**Plenary**)

CLEO/EUROPE-EQEC, Silicon photonics, Munich, Germany, June 24-25 (**Plenary**)

IEEE International Frequency Control Symposium and the European Frequency and Time Forum, "Photonics on Chip" Orlando, Florida, April 14-19 2019, (**Keynote**)

Physics and Simulations Conference of the SPIE Optics and Optoelectronics Symposium, "Photonics on Chip" Prague, Czech Republic, April 1-4 2019, (**Keynote**)

APS CUWIP at William and Mary, "Photonics on Chip", Richmond, Virginia, January 18-20 2019 (**Plenary**)

EPFL Photonics Day, "Photonics on Chip", Lausanne, Switzerland, December 8-11, 2018 (**Keynote**)

Latin America Optics and Photonics Conference (LAOP 2018) "Next Generation Photonics based on 2D materials" Lima, Peru, November 12-15, 2018 (**Plenary**)

Nature Conference on Nanophotonics and Integrated Photonics, "Next Generation Photonics based on 2D materials" Nanjing, Jiangsu, China, November 7 -11, 2018 **(Plenary)**

7th conference on Advances in Optoelectronics and Micro/nano-optics (AOM 2018), "Next Generation Silicon Photonics", Xi'an, China, October 9 -12, 2018 **(Plenary)**

International Quantum Cascade Laser School and Workshop, "Photonics on Chip", Cassis, France, September 2-7 2018 **(Keynote)**

NFO-15 The 15th International Conference on Near Field Optics, nanophotonics & Related Techniques, Troyes France August 26-31 2018 **(Plenary)**

SIAM Conference on Mathematical Aspects of Materials Science, "Photonics on Chip", Portland, Oregon, July 9-11 2018 **(Plenary)**

2018 OSA Advanced Photonics Congress, "Photonics on Chip", Zurich, Switzerland, July 2-5 2018 **(Keynote)**

2018 XLI Brazilian Physical Society, " Next Generation Silicon Photonics" Foz do Iguacu, Brazil, May 6 -11, 2018 **(Plenary)**

The "Technology Innovation Science Match". , "Photonics on Chip", Fraunhofer Institute, Berlin, Germany, February 22 2018 **(Keynote)**

The IEEE Photonics Annual Meeting, "Photonics on Chip" , Orlando, Florida, October 1-5, 2017 **(Plenary)**

International Conference on Optical MEMS and Nanophotonics (OMN2017) INCP 2017 Santa Fe NM, Aug 1-4, 2017 **(Keynote)**

10th International Conference on Nanophotonics, "Photonics on Chip" Recife-PE, Brazil, July 2-5, 2017 **(Keynote)**

EOSAM 2016, "Next Generation Silicon Photonics" Berlin, Germany, Sept 26-30, 2016 **(Plenary)**

FiO-Optical Society of America Annual Meeting, Rochester, NY October 10, 2016 **(Plenary)**

International Conference on Computer-Aided Design, "Manipulating Light on Chip", Irvine, CA November 13-17 2016 **(Keynote)**

The Device Research Conference, University of Delaware, "Novel Materials for Photonics" Newark, Delaware, June 19-22 2016 **(Plenary)**

International Year of Light 2015 Celebration, University of Sydney, "Public lecture that looks forward and imagines the future", Sydney, Australia, December 8, 2015 **(Keynote)**

Micro + Nano Materials, Devices, and Applications Conference, SPIES, "Strong Interaction between Photons, Phonons, and Electrons Enabled, by Silicon Photonics", Sydney, Australia, December 7, 2015 **(Plenary)**

The 39th Annual Conference of the Division of Atomic, Molecular, and Optical Physics, The Dutch Physical Society AMO Meeting, "Extreme Manipulation of Light Using Nano Photonics", Lunteren, Netherlands, October 13-14, 2015 **(Keynote)**

The 2015 Blavatnik Science Symposium, "Computing at the Speed of Light" The New York Academy of Science, New York, NY, August 6, 2015 **(Keynote)**

SPIE Europe 2014, “Pushing the boundaries of silicon photonics”, Brussels, Belgium, April 14-17, 2014 **(Plenary)**

SPIE- Photonics West “Pushing the boundaries of silicon photonics”, San Francisco, CA, February 1-6, 2014 **(Plenary)**

Progress In Electromagnetics Research Symposium (PIERS), “Photonic transitions for enabling non reciprocity in silicon”, Stockholm, Sweden, August 12-15, 2013 **(Keynote)**

Symposium on Nanophotonics for Detection and Sensing, Israel, “Fundamental phenomena in high confinement photonics”, Institute of Technology, Israel, January 20-21, 2013 **(Keynote)**

Optics and Photonics Taiwan, International Conference, “High confinement silicon photonics”, Taipei, Taiwan, December 6-8, 2012 **(Plenary)**

OptoElectronics and Communications Conference, “Silicon photonics”, Busan, Korea, July 2-6, 2012 **(Plenary)**

Centre for Advanced Systems and Technologies in Communications Summer School, McGill University, “Silicon photonics”, Montreal, Quebec, June 14-15, 2012 **(Keynote)**

Conference on Lasers and Electro-Optics (CLEO) Europe, “Manipulating light on chip”, Munich, Germany, May 22 – 26, 2011 **(Keynote)**

The International Conference Nanoscale Materials and Devices for Energy Conversion, “Manipulating light on chip”, Natal, Brazil, April 4 – 6, 2011 **(Plenary)**

PATENTS GRANTED

1. Michal Lipson, Yoon Hu Lee, Jaime Cardenas, Linear optical phase modulators, **Patent number: US10216016B2, (2019)**
2. Michal Lipson, Lian-Wee Luo, Lucas Heitzmann Gabrielli, Optical mode-division multiplexing using selected mode coupling between an optical resonator and a signal transmission line, **Patent number: 10033478 (2018)**
3. Michal Lipson, Alexander Gaeta, Austin G. Griffith, Jaime Cardenas, Ryan K. W. Lau, Yoshitomo Okawachi, Romy Fain, On-chip integrated gas sensor based on photonic sensing, **Patent number: 10088414 (2018)**
4. Igor V. Vernik, Oleg A. Mukhanov, Alan M. Kadin, Christopher Thomas Phare, Michal Lipson, Keren Bergman, System and method for cryogenic optoelectronic data link, **Patent number: 10097281 (2018)**
5. Brian Stern, Michal Lipson, Aseema Mohanty, Felipe Barbosa, Jaime Cardenas, Photonic chips based on multimode fiber-to-waveguide coupling, **Patent number: 10156679 (2018)**
6. Michal Lipson, Michelle D. Wang, Mohammad Soltani, Tunable optofluidic apparatus, method and applications, **Patent number: 9664500 (2017)**
7. Michal Lipson, Bernado Kyotoku, Long Chen, optical apparatus, method, and applications, **Patent number: 9819435 (2017)**
8. Michal Lipson, Bernado Kyotoku, Long Chen, optical apparatus, method, and applications, **Patent number: 9819435 (2017)**

9. Brian Stern, Michal Lipson, Aseema Mohanty, Felipe Barbosa, Jaime Cardenas, Photonic chips based on multimode fiber-to-waveguide coupling, **Patent number: 9746614** (2017)
10. Michal Lipson, Biswajeet Guha, Fiber-waveguide evanescent coupler, **Patent number: 9746612** (2017)
11. Lipson, M., Lee, Yoon Ho, Integrated multi-chip module optical interconnect platform, **Patent No. 9620489** (2017)
12. Lipson, M., Leonhardt, Ulf, Tyc, Tomas, Heitzmann Gabrielli, Lucas, Imaging device and method, **Patent No. 9581796** (2017)
13. Lipson, M., Nitkowski, A., Integrated optofluidic system using microspheres. **Patent No. 9551650** (2017)
14. Lipson, M., Wang, Michelle D., Soltani, M., Lin, Jun., Saraf, Summer N., Microfluidic chip having on-chip electrically tunable high-throughput nanophotonic trap, **Patent No. 9433941** (2016)
15. Lipson, M., Gaeta, A., Foster, M., Geraghty, D., Salem, Reza, Foster, Amy, Apparatus for imparting phase shift to input waveform **Patent No. 9323284** (2016)
16. Lipson, M., Erickson, D., Yang, A., Schmidt, Brad, Moore, Sean, Optical force based biomolecular analysis in slot waveguides, **Patent No. 9322995** (2016)
17. Lipson, M., Manipatruni, S., Robinson, Jacob T., Optomechanical non-reciprocal device, **Patent No. 9423605** (2016)
18. Lipson, M., Gaeta, A., Salem, Reza., Foster, Mark., Geraghty, David., Park, Menlo., Foster, Amy., Glencoe, Sparks., High-speed Optical Sampling by Temporal Stretching Using Four-wave Mixing **Patent No. 9291509** (2016)
19. Lipson, M., Manipatruni, S., Chen, Long., Preston, K., Electro-optic Modulator Structures, Related Methods and Applications, **Patent No. 9217830** (2015)
20. Lipson, M., Manipatruni, S., Wiederhecker, G., Tunable Optical Apparatus, Method and Applications, **Patent No. 9057829** (2015)
21. Lipson, M., Preble, S., Dynamic Wavelength Converter, **Patent No. 9086584** (2015)
22. Foster, Mark., Gaeta, A., Geraghty, D., Lipson, M., Salem, R., Foster, A., Apparatus for Imparting Phase Shift to Input Waveform, **Patent no. 9182776** (2015)
23. Lipson, M., Preston, K., Polysilicon Photodetector, Methods and Application, **Patent No. 9153715** (2015)
24. Lipson, M., Gabrielli, S.G., Johnson, S.G., and Liu, D., Controlled inter-mode cross-talk in optical waveguides, **Patent No. 9031362** (2015).
25. Nitkowski, A., and Lipson, M., Cavity-enhanced on-chip absorption spectroscopy, **Patent No. 8992836** (2015).
26. Manipatruni, S., Dokania, R., Apse, A., and Lipson, M., Apparatus and methods for wide temperature range operation of micrometer-scale silicon electro-optic modulators, **Patent No. 8824036** (2015).
27. Lipson, M., and Preston, K., Polysilicon photodetector, methods and applications, **Patent No. 8861909** (2014).
28. Lipson, M., Manipatruni, S., Preston, K., and Schmidt, B., Semiconductor high-speed integrated electro-optic devices and methods, **Patent No. 8805130** (2014).

29. Xu, Q., Lipson, M., Optical logic device, **Patent No. 8731355** (2014).
30. Lipson, M., Gondarenko, A., Sherwood, N., Waveguide structure and related fabrication method, **Patent No. 8655138** (2014).
31. Kimerling, L. C., Atwater, H., Brongersma, M. L., Dal Negro, L., Koch, T. L., Fauchet, P., Lipson, M., Michel, J., Barrios, C. A., Electrically pumped extrinsic semiconductor optical amplifier with slot waveguide, **Patent No. 8619358** (2013).
32. Lipson, M., Manipatruni, S., Lira, H. L., Pin diode tuned multiple ring waveguide resonant optical cavity switch and method, **Patent No. 8606055** (2013).
33. Manipatruni, S., Lipson, M., Electro-optic modulator, **Patent No. 8488917** (2013).
34. Lipson, M., Guha, B., Passively-thermally-stabilized photonic apparatus, method and applications, **Patent No. 8457453** (2013).
35. Manipatruni, S., Xu, Q., Lipson, M., Electro-optical Modulator, **Patent No. 8295655** (2012).
36. Foster, M., Gaeta, A., Lipson, M., Sharping, J., Turner, A., Silicon integrated photonic optical parametric amplifier oscillator and wavelength converter, **Patent No. 8041157** (2011).
37. Lipson, M., Schmidt, B., Pradhan, S., Xu, Q., Electro-optic modulation, **Patent No. 7751654** (2010).
38. Barrios, C. A., Lipson, M., Light emitting slot-waveguide device, **Patent No. 7606455** (2009).
39. Lipson, M., Barrios, C., Rosa De Almeida, V., Waveguide structure for guiding light in low-index material , **Patent No. 7519257** (2009)
40. Rosa De Almeida; V., Barrios, C., Panepucci, R., Lipson, M., Light scattering optical resonator, **Patent No. 7536070** (2009).
41. Barrios, C., Lipson, M., Rosa De Almeida, V., Electro-optic modulator on rib waveguide, **Patent No. 7555173** (2009).
42. Rosa De Almeida, V., Barrios, C., Panepucci, R., Lipson, M., Optically controlled photonic switch, **Patent No. 7400798** (2008).
43. Rosa De Almeida, V., Barrios, C. A., Panepucci, R., Lipson, M., Light scattering optical
44. Resonator, **Patent No. 7184632** (2007).
45. Loo, L., Lipson, M., Gleason, K., Kimerling, L., Air gaps for optical applications, **Patent No. 7227678** (2007).
46. Panepucci, R., Ilic, B., Lipson, M., Rosa De Almeida, V., Optical waveguide displacement sensor, **Patent No. 7274835** (2007).
47. Joannopoulous, J., Fan, S., Lipson, M., Chen, K., Kimerling, L., Tunable Chromatic Dispersion Compensation, **Patent No. 7190853** (2007).
48. Lipson, M., Rosa De Almeida, V., Barrios, C., High-index contrast distributed Bragg reflector, **Patent No. 7113673** (2006).
49. Lipson, M., Kimerling, L., All optical switch for optical integrated circuits, **Patent No. 6684003** (2004).
50. Lipson, M., Kimerling, L., Microcavity amplifiers, **Patent No. 6567209** (2003).
51. Fan, S., Joannopoulos, J., Kenney, G., Lipson, M., Chen, K., Kimerling, L., Thin film filters using omnidirectional reflectors, **Patent No. 6624945** (2003).

52. Lipson, M., Kimerling, L., Resonant microcavities, **Patent No. 6627923** (2003).