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Brief Bio: Keren Bergman is the Charles Batchelor Professor of Electrical Engineering at Columbia University where she also serves as the Faculty Director of the Columbia Nano Initiative. Prof. Bergman received the B.S. from Bucknell University in 1988, and the M.S. in 1991 and Ph.D. in 1994 from M.I.T. all in Electrical Engineering. At Columbia, Bergman leads the Lightwave Research Laboratory (<http://lightwave.ee.columbia.edu/>) encompassing multiple cross-disciplinary programs at the intersection of computing and photonics. Her work involves the design exploration, architecture, and implementation of photonic systems that incorporate the advantages of manipulating information in the optical domain for accelerating energy efficient high performance computing and data centers. Bergman serves on the Leadership Council of the American Institute of Manufacturing (AIM) Photonics leading projects that support the institute's silicon photonics manufacturing capabilities and Datacom applications. She is the recipient of the 2016 IEEE Photonics Engineering Award and is a Fellow of the Optical Society of America (OSA) and IEEE.

Appointments

2016- Present	- AIM Photonics Institute, Leadership Council
2014- Present	- Founder and Faculty Director, Columbia Nano Initiative
2011- Present	- Charles Batchelor Professor of Electrical Engineering
2002- Present	- Director, Lightwave Research Laboratory, Columbia University
2011- 2017	- Chair, Department of Electrical Engineering, Columbia University
2006-2010	- Professor of Electrical Engineering, Columbia University
2007-2008	- Visiting Research Fellow IBM T. J. Watson Research Labs
2001-2006	- Associate Professor of Electrical Engineering, Columbia University
2000-2001	- Senior Member of Technical Staff, Tellium, Inc.
1998-2007	- Senior Technical Advisor, National Security Agency
1995-2000	- Technical Consultant, Bell Laboratories, Lucent Technologies
1994-1999	- Assistant Professor of Electrical Engineering, Princeton University

Education

- **Massachusetts Institute of Technology**, Ph.D. in Electrical Engineering, June 1994.
- **Massachusetts Institute of Technology**, M.S. in Electrical Engineering, February 1991.
- **Bucknell University**, B.S. in Electrical Engineering, June 1988. Summa Cum Laud.

Honors and Awards

- IEEE Photonics Engineering Award 2016
- 2016 Herman Haus Distinguished Lecture, MIT
- Charles Batchelor Professor of Electrical Engineering 2011
- IEEE Fellow 2009

- IBM Faculty Award 2008
- Optical Society of America (OSA) Fellow 2003
- CalTech President's Award 1997
- Wentz Award for Teaching and Scholarship 1996
- Office of Naval Research Young Investigator 1996-1999
- National Science Foundation CAREER Program Investigator 1995-1998
- AT&T Bell Laboratories Fellowship, 1991-1994
- General Electric Fellow, 1988-1989; Eastman Kodak Scholar 1985-1988

Recent Leadership and Professional Activities

- DOE Advanced Scientific Computing Advisory Committee
- Editorial Advisory Board of APL Photonics
- IEEE Photonics Award Committee
- Brookhaven National Laboratory Computational Science Initiative scientific advisory board

Recent Publications

Books:

Photonic Network-on-Chip Design; Keren Bergman, Luca Carloni, Aleksandr Biberman, Johnnie Chan, and Gilbert Hendry, Series: Integrated Circuits and Systems, Vol. 68, Springer Science + Business Media New York 2014.

Optical Interconnects for Future Data Center Networks; Christoforos Kachris, Keren Bergman, and Ioannis Tomkos, Springer Science + Business Media New York 2013.

Book Chapters:

Optical Fiber Telecommunications VII 2019: (Book Chapter) Optical Interconnection Networks for High Performance Systems, Qixiang Cheng, Madeleine Glick, Keren Bergman

Springer Handbook of Optical Networks, (2019): (Book Chapter) Evolving requirements and trends of HPC, Sébastien Rumley, Ashkan Seyedi, Marco Fiorentino, Keren Bergman

Journal and Conference Publications:

1. Qixiang Cheng, Liang Yuan Dai, Nathan C Abrams, Yu-Han Hung, Padraic E Morrissey, Madeleine Glick, Peter O'Brien, and Keren Bergman, "Ultralow-crosstalk, strictly non-blocking microring-based optical switch," *Photonics Research*, 7, 155-161 (February 2019).
2. Yiwen Shen, Xiang Meng, Qixiang Cheng, Sebastien Rumley, Nathan Abrams, Alexander Gazman, Evgeny Manzhosov, Madeleine Glick, Keren Bergman, [Invited] "Silicon Photonics for Extreme Scale Systems," *IEEE/OSA Journal of Lightwave Technology*, 37, 245-259 (January 2019).
3. Qixiang Cheng, Meisam Bahadori, Madeleine Glick, Sébastien Rumley, and Keren Bergman, "Recent advances in optical technologies for data centers: a review," *Optica*, 5, 1354-1370 (November 2018).
4. Q. Cheng, S. Rumley, M. Bahadori, and K. Bergman, "Photonic switching in high performance datacenters [Invited]," *Optics Express* 20th Anniversary issue, 26, 16022-16043 (June 2018).
5. M. Bahadori, M. Nikdast, S. Rumley, L. Y. Dai, N. Janosik, T. V. Vaerenbergh, A. Gazman, Q. Cheng, R. Polster, and K. Bergman, "Design Space Exploration of Microring Resonators in Silicon Photonic Interconnects: Impact of the Ring Curvature," in *IEEE/OSA Journal of Lightwave Technology*, (March 2018).
6. Y. Shen, M. H N Hattink, P. Samadi, Q. Cheng, Z. Zhu, A. Gazman, and K. Bergman, "Software-Defined Networking Control Plane for Seamless Integration of Multiple Silicon Photonic Switches in Datacom Networks," *Optics Express* 26, 10914-10929 (2018)

7. M. Bahadori, A. Gazman, N. Janosik, S. Rumley, Z. Zhu, R. Polster, Q. Cheng, K. Bergman, "Thermal Rectification of Integrated Microheaters for Microring Resonators in Silicon Photonics Platform," *IEEE/OSA J. of Lightwave Technology* 36 (3) (Feb, 2018).
8. Y. Huang, P. B. Cho, P. Samadi, and K. Bergman, "Power excursion mitigation for flexgrid defragmentation with machine learning," in *IEEE/OSA Journal of Optical Communications and Networking*, vol. 10, no. 1, pp. A69-A76 (Jan. 2018).
9. Y. Shen, P. Samadi, and K. Bergman, "Autonomous Network and IT Resource Management for Geographically Distributed Data Centers," in *IEEE/OSA Journal of Optical Communications and Networking*, vol. 10, no. 2, pp. A225-A231 (Feb. 2018).
10. H. Guan, Y. Ma, R. Shi, X. Zhu, R. Younce, Y. Chen, J. Roman, N. Ophir, Y. Liu, R. Ding, T. Baehr-Jones, K. Bergman, and M. Hochberg, "Compact and low loss 90° optical hybrid on a silicon-on-insulator platform," *Optics Express* 25, 28957-28968 (2017)
11. M. Y. Teh, J. J. Wilke, K. Bergman, S. Rumley, "Design space exploration of the Dragonfly topology," [Best Paper Award] Workshop on Communication Architectures for HPC, Big Data, Deep Learning and Clouds at Extreme Scale, ISC (June, 2017).
12. M. Fiorani, P. Samadi, Y. Shen, L. Wosinska, K. Bergman, "Flexible Network Architecture and Provisioning Strategy for Geographically Distributed Metro Data Centers," *Journal of Communications and Networking (JOCN)* 9 (5) 385-392 (May 2017).
13. S. Rumley, M. Bahadori, R. Polster, S. D. Hammond, D. M. Calhoun, K. Wen, A. Rodrigues, and K. Bergman, "Optical interconnects for extreme scale computing systems," *Parallel Computing*, Vol 61, (Feb 2017).
14. Y. Huang, C. Gutterman, P. Samadi, P. Cho, W. Samoud, C. Ware, M. Lourdiane, G. Zussman, K. Bergman, "Dynamic mitigation of EDFA power excursions with machine learning," *Optics Express* 25, 2245-2258 (2017).
15. P. Samadi, M. Fiorani, Y. Shen, L. Wosinska, K. Bergman, "Flexible Architecture and Autonomous Control Plane for Metro-scale Geographically Distributed Data Centers [Invited]," in *J. of Lightwave Technology*, vol. 35, no. 6, pp. 1188-1196, March 15, 2017.
16. A. Gazman, C. Browning, M. Bahadori, Z. Zhu, P. Samadi, S. Rumley, V. Vujicic, L. P. Barry, K. Bergman, "Software-defined control-plane for wavelength selective unicast and multicast of optical data in a silicon photonic platform," *Opt. Express* 25, 232-242 (2017).
17. D. Nikolova, D. M. Calhoun, Y. Liu, S. Rumley, A. Novack, T. Baehr-Jones, M. Hochberg, K. Bergman, "Modular architecture for fully non-blocking silicon photonic switch fabric," *Nature Microsystems & Nanoengineering* 3 (1607) (2017).
18. K. Wen, P. Samadi, S. Rumley, C. P. Chen, Y. Shen, M. Bahadori, J. Wilke, K. Bergman, "Flexfly: Enabling a Reconfigurable Dragonfly Through Silicon Photonics," [Best Student Paper Award] The International Conference for High Performance Computing, Networking, Storage and Analysis (SC|16) (Nov 2016).