Benjamin Williams

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Primary Area: Physical and Wave Electronics

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Research Lab: Terahertz Devices and Intersubband Nanostructures Laboratory

Research and Teaching Interests:
Terahertz and mid-infrared quantum cascade lasers and photonic devices, low-dimensional semiconductor materials and intersubband physics, terahertz and infrared plasmonics, waveguides, antennas

Awards and Recognitions

2016 Presidential Early Career Award for Scientists and Engineers (PECASE)
2012 National Science Foundation CAREER Award
2008 DARPA Young Faculty Award (YFA)

- L. Xu, P. W. C. Hon, C. Curwen, Q.-S. Chen, T. Itoh, and B. S. Williams, "Metasurface external cavity laser," *Applied Physics Letters,* vol 107, 221105, 2015
- B. A. Burnett and B. S. Williams, "Density matrix model for polarons in a terahertz quantum dot cascade laser," *Phys. Rev. B*, vol 90, 155309, 2014.
- A. A. Tavallaee, P. W. C. Hon, Q.-S. Chen, T. Itoh, and B. S. Williams, "Active terahertz quantum-cascade composite right/left-handed metamaterial," *Applied Physics Letters* vol 102, 021103, January 14 2013.
- P. W. C. Hon, Z. Liu, T. Itoh, and B. S. Williams, "Leaky and bound modes in terahertz metasurfaces made of transmission-line metamaterials," *Journal of Applied Physics* vol 113, 033105, January 18 2013.
- P. W. C. Hon, A. A. Tavallaee, Q.-S. Chen, B. S. Williams, and T. Itoh, "Radiation Model for Terahertz Transmission-Line Metamaterial Quantum-Cascade Lasers," *IEEE Trans. Terahertz Science and*

Technology vol. 2, no 3, pp. 323-332, May 2012. Winner of 2013 IEEE Transactions on THz Science and Technology **Best Paper Award**.

- Benjamin S. Williams, "Terahertz quantum cascade lasers." *Nature Photonics*, vol. 1, September 2007, pp. 517-525. (review article)
- B. S. Williams, S. Kumar, Q. Hu and J. L. Reno, "High-power terahertz quantum-cascade lasers." *Electronics Letters*, vol. 42, no. 2, 19 January 2006, pp. 89-90.
- B. S. Williams, S. Kumar, H. Callebaut, Q. Hu and J. L. Reno, "Terahertz quantum-cascade laser at 100 um using metal waveguide for mode confinement." *Applied Physics Letters*, vol. 83, no. 11, 15 Sept. 2003, pp. 2124-6.
- B. S. Williams, H. Callebaut, S. Kumar, Q. Hu and J. L. Reno, "3.4-THz quantum cascade laser based on longitudinal-optical-phonon scattering for depopulation." *Applied Physics Letters*, vol. 82, no. 7, 17 Feb. 2003, pp. 1015-7.