



## **BOULDER**

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## **PRACTICE AREAS**

Intellectual Property

## **INDUSTRIES**

Technology

Disruptive Technology

## **EDUCATION**

University of Colorado, Ph.D.,  
Electrical Engineering, 2005

University of Colorado, M.S.,  
Electrical Engineering, 2001

Swarthmore College, B.A.,  
Physics, *with honors*, 1997

# **Brian T. Schwartz, Ph.D.**

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Dr. Brian Schwartz's background is in physics and optical engineering, with an emphasis in numerical simulations of photonic technologies such as CMOS image sensor pixels, photonic-crystal waveguides, silicon photonics, optical metamaterials, free-electron lasers, and laser-based particle accelerators. Dr. Schwartz also served as a senior optoelectronic engineer for OmniVision Technologies, a developer of advanced digital imaging solutions.

Dr. Schwartz assists in patent prosecution, litigation, patentability determinations, and infringement analysis in technologies including optics, photonics, imaging, image processing; mobile devices, smart displays, video security devices; telecommunications, signal processing, video encoding; stabilized lasers and applications thereof; and machine learning.

Areas of technical emphasis:

- optics, photonics, imaging, image processing
  - wafer-level optics, chip-scale image sensor packages, transfer-gate design
  - phase-detection auto-focus, edge detection methods, lane detection methods, high-dynamic range imaging, demosaicing, angular localization
  - medical imaging: MRI, endoscopes, gamma-ray imaging
  - silicon photonics, fiber optics, modal noise mitigation
  - nanophotonics, metasurfaces, plasmonics, solar-selective absorbers
  - video displays, liquid crystal on silicon, polarization converters

- remote sensing: lidar, angular localization, temperature measurement
- mobile devices, smart displays, video security devices
- telecommunications, signal processing, video encoding
  - carrier phase recovery, burst timing, passive optical network architecture, wavelength division multiplexing
  - base-layer and enhancement-layer video streams, video overlay methods, tone-mapping
  - wireless communication
- stabilized lasers: spectroscopy, laser stabilization methods, atomic clocks, materials characterization
- machine learning, neural networks, classifiers

## Publications

Dr. Schwartz's publications include:

- E. A. Peralta, K. Soong, R. J. England, E. R. Colby, Z. Wu, B. Montazeri, C. McGuinness, J. McNeur, K. J. Leedle, D. Walz, E. B. Sozer, B. Cowan, B. Schwartz, G. Travish, R. L. Byer. "Demonstration of electron acceleration in a laser-driven dielectric microstructure," *Nature*, 503, 91-94 (2013).
- B.T. Schwartz et al, "Coherent Electron Cooling: Status of Single-Pass Simulations," *Proceedings of the International Particle Accelerator Conference*, (2013).
- Z. Li, M. Mohammed, X. Chen, E. Dudley, K. Meng, L. Shang, A. Mickelson, R. Joseph, M. Vachharajani, B. Schwartz, and Y. Sun, "Reliability Modeling and Management of Nanophotonic On-Chip Networks," *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, 99, 1, (2011).
- Z. A. Sechrist, B. T. Schwartz, J. H. Lee, J. A. McCormick, R. Piestun, W. Park, and S. M. George, "Modification of Opal Photonic Crystals Using Al<sub>2</sub>O<sub>3</sub> Atomic Layer Deposition," *Chemistry of Materials* 18 (15), 3562-3570 (2006).
- B. T. Schwartz and R. Piestun, "Dynamic properties of photonic crystals and their effective refractive index," *J. Opt. Soc. Am. B* 22, 2018-2026 (2005).
- B. T. Schwartz and R. Piestun, "Waveguiding in air by total external reflection from ultralow index metamaterials," *Appl Phys Lett*, 85, 1 (2004).

- B. T. Schwartz and R. Piestun, "Total external reflection from metamaterials with ultralow refractive index," J. Opt. Soc. Am. B 20, 2448-2453 (2003).

## Honors

- National Academy of Sciences Science & Technology Policy Graduate Fellowship, 2005
- International Society of Optical Engineering (SPIE) scholarship, 2005
- Fellowship, Optical Science & Engineering Program, University of Colorado, 1999-2004