ELECTROMAGNETISM

Christopher S. Baird

B. S. Physics – Brigham Young University, 2001

Ph.D. – University of Massachusetts Lowell, 2007

Selected Papers

"Application of multi-subband self-consistent energy balance method to terahertz quantum cascade lasers," P. Slingerland, C. Baird, R. Giles, *Semiconductor Science and Technology* 27 (6).

"Terahertz ISAR and x-ray imaging of large area wind turbine blade defects," R. Martin, C. Baird, R. Giles, A. Schoenberg, C. Niezrecki, in *Smart Materials and Nondestructive Evaluation for Energy Systems*, edited by Norbert G. Meyendorf, Proceedings of SPIE Vol. 9806 (SPIE, Bellingham, WA) 980618.

"The effects of various approximations on electron-electron scattering calculations in QCLs," P. Slingerland, C. Baird, R. Giles, in *Terahertz Technology and Applications IV*, edited by Laurence P. Sadwick, Proceedings of SPIE Vol. 7938 (SPIE, Bellingham, WA) 793809.

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Dr. Baird's field of research is computational electromagnetism with a special emphasis on terahertz imaging and terahertz lasers. He is researching the development of the quantum cascade laser, which has proved itself to be the first compact source of coherent terahertz waves. He has developed computational methods that accurately predict the electron and photon behavior in quantum cascade lasers and has used these methods to improve the design of various lasers. Dr. Baird also studies the application of terahertz waves to the detection of subsurface defects in wind turbine blades. He has demonstrated that polarimetric terahertz imaging can indeed be used to detect these hidden defects. Dr. Baird carried out this research for eight years as a Senior Scientist and Adjunct Faculty at the Submillimeter-Wave Technology Laboratory at the University of Massachusetts Lowell, where he was supported by various grants from the NSF WindSTAR program and the U.S. Army's National Ground Intelligence Center. He is now continuing this research at West Texas A&M University.