

**Kevin J. Malloy**

Professor,

Associate Dean for Research, School of Engineering

Department of Electrical and Computer Engineering

UNIVERSITY OF NEW MEXICO

**Role in the Center: Co-Investigator****Areas of Research:** Waves in periodic structures. Structure-property relations of photonic nanomaterials. Optoelectronic quantum dots.

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**A. PROFESSIONAL PREPARATION****University of Notre Dame**

Electrical Engineering, B.S., 1978

**Stanford University**

Electrical Engineering, M.S., 1980

**Stanford University**

Electrical Engineering, Ph.D., 1984

**B. APPOINTMENTS****Associate Dean for Research**, School of Engineering, University of New Mexico 2004-present**Associate Director**, Center for High Technology Materials 2000-2004**Professor**, ECE Department, University of New Mexico 2000-present**Associate Professor**, ECE Department, University of New Mexico ???-2000**Assistant Professor**, ECE Department, University of New Mexico ???-???**Visiting Associate Research Engineer**, The University of California at Berkeley 1988-1990**C. SYNERGISTIC ACTIVITIES**

Prof. Malloy has over 20 years of experience in solid-state physics devices, modeling, and fabrication techniques, and is leading a large research group. Over the past 20 years, he has graduated 17 Ph.D. and many M.S. students. He has served as the Principal Investigator on many projects sponsored by ARO, ONR, ARL, NSF, DARPA, NASA, and many industries. He has published many book chapters and more than 150 papers in refereed journals and invited presentations in many national and international conferences.

Professor Malloy received the School of Engineering's Research Excellence Award in 1994 and Teaching Excellence award in 1996. His professional service includes: Conference Co-Chairman, Quantum Lasers, SPIE International Symposium Optoelectronics 2002, Jan. 2002; and the Technical Program Committee, Conference on Lasers and Electro-Optics (CLEO, 2000-2004).

**D. RELATED PUBLICATIONS**

1. G. T. Liu, A. Stintz, H. Li, K. J. Malloy, and L. F. Lester, "Extremely low room-temperature threshold current density diode lasers using InAs dots in  $\text{In}_{0.15}\text{Ga}_{0.85}\text{As}$  quantum well," *Electronics Letters*, vol. 35, pp. 1163-1165, 1999.
2. M. Mojahedi, K. J. Malloy, G. V. Eleftheriades, J. Woodley, and R. Y. Chiao, "Abnormal wave propagation in passive media," *IEEE Journal Of Selected Topics In Quantum Electronics*, vol. 9, pp. 30-39, 2003.
3. H. Y. Fan, K. Yang, D. M. Boye, T. Sigmon, K. J. Malloy, H. F. Xu, G. P. Lopez, and C. J. Brinker, "Self-assembly of ordered, robust, three-dimensional gold nanocrystal/silica arrays," *Science*, vol. 304, pp. 567-571, 2004.
4. S. Zhang, W. J. Fan, N. C. Panoiu, K. J. Malloy, R. M. Osgood, and S. R. J. Brueck, "Experimental demonstration of near-infrared negative-index metamaterials," *Physical Review Letters*, vol. 95, pp. 137404, 2005.
5. W. J. Fan, S. Zhang, B. Minhas, K. J. Malloy, and S. R. J. Brueck, "Enhanced infrared transmission through subwavelength coaxial metallic arrays," *Physical Review Letters*, vol. 94, pp. 033902, 2005
6. X. D. Huang, A. Stintz, C. P. Hains, G. T. Liu, J. Cheng, and K. J. Malloy, "Efficient high-temperature

- CW lasing operation of oxide-confined long-wavelength InAs quantum dot lasers," *Electronics Letters*, vol. 36, pp. 41-42, 2000.
7. B. K. Minhas, W. Fan, K. Agi, S. R. J. Brueck, and K. J. Malloy, "Metallic inductive and capacitive grids: theory and experiment," *Journal Of The Optical Society Of America A Optics Image Science And Vision*, vol. 19, pp. 1352-1359, 2002.
  8. A. Stintz, G. T. Liu, A. L. Gray, R. Spillers, S. M. Delgado, and K. J. Malloy, "Characterization of InAs quantum dots in strained  $\text{In}_x\text{Ga}_{1-x}\text{As}$  quantum wells," *Journal of Vacuum Science & Technology B*, vol. 18, pp. 1496-1501, 2000.
  9. A. Stintz, T. J. Rotter, and K. J. Malloy, "Formation of quantum wires and quantum dots on buffer layers grown on InP substrates," *Journal Of Crystal Growth*, vol. 255, pp. 3-4, 2003.
  10. S. C. Lee, K. J. Malloy, and S. R. J. Brueck, "Nanoscale selective growth of GaAs by molecular beam epitaxy," *Journal of Applied Physics*, vol. 90, pp. 4163-4168, 2001.
  11. T. V. Torchynska, J. L. C. Espinola, P. G. Eliseev, A. Stintz, K. J. Malloy, and R. P. Sierra, "Localized excitons in InAs self-assembled quantum dots embedded in InGaAs/GaAs multi-quantum wells," *Physica Status Solidi A Applied Research*, vol. 195, pp. 209-213, 2003.
  12. K. Agi, M. Mojahedi, B. Minhas, E. Schamiloglu, and K. J. Malloy, "The effects of an electromagnetic crystal substrate on a microstrip patch antenna," *IEEE Transactions on Antennas and Propagation*, vol. 50, pp. 451- 456, 2002.
  13. D. A. Yarotski, R. D. Averitt, N. Negre, S. A. Crooker, A. J. Taylor, G. P. Donati, A. Stintz, L. F. Lester, and K. J. Malloy, "Ultrafast carrier-relaxation dynamics in self-assembled InAs/GaAs quantum dots," *Journal Of The Optical Society Of America B Optical Physics*, vol. 19, pp. 1480-1484, 2002.
  14. G. P. Donati, R. Kaspi, and K. J. Malloy, "Estimating the band discontinuity at GaInSb/GaSb heterojunction by investigation of single-quantum well photoluminescence," *Journal Of Applied Physics*, vol. 15, pp. 1083-1086, 2003.
  15. S. Raghavan, P. Rotella, A. Stintz, K. J. Malloy, S. Krishna, and A. L. Gray, "Structural and optical characterization of rapid thermally annealed InAs/ $\text{In}_{0.15}\text{Ga}_{0.85}\text{As}$  dots-in-well structure," *Journal Of Crystal Growth*, vol. 247, pp. 3-4, 2003.
  16. M. Mojahedi, E. Schamiloglu, F. Hegeler, and K. J. Malloy, "Time-domain detection of superluminal group velocity for single microwave pulses," *Physical Review E*, vol. 62, pp. 5758-5766, 2000.
  17. F. Gelbard and K. J. Malloy, "Modeling quantum structures with the boundary element method," *Journal of Computational Physics*, vol. 172, pp. 19-39, 2001.
  18. A. A. Ukhanov, R. H. Wang, T. J. Rotter, A. Stintz, L. F. Lester, P. G. Eliseev, and K. J. Malloy, "Orientation dependence of the optical properties in InAs quantum-dash lasers on InP," *Applied Physics Letters*, vol. 5, pp. 981-983, 2002.
  19. A. A. Ukhanov, A. Stintz, P. G. Eliseev, and K. J. Malloy, "Comparison of the carrier induced refractive index, gain, and linewidth enhancement factor in quantum dot and quantum well lasers," *Applied Physics Letters*, vol. 84, pp. 1058-1060, 2004.