

Chad Edward Duty

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EDUCATION:

- Ph.D. Georgia Institute of Technology, Atlanta, GA
Mechanical Engineering, Doctorate of Philosophy, December 2001
- B.S. Virginia Polytechnic Institute & State University, Blacksburg, VA
Mechanical Engineering, Bachelor of Science Degree, May 1997

EXPERIENCE:

- Solar Program Manager**, Oak Ridge National Laboratory (January 2009 to present)
Develop and communicate vision for solar research across multiple directorates at ORNL.
- Successfully grown ORNL's solar program by **~10x** over 3 years (up to \$12M in FY11 from ~\$1.5M in FY08)
- Promote ORNL's solar research efforts to DOE and the Solar Energy Technologies Program
- Presentation to House Science & Technology Subcommittee (10/6/10)
 - Invited presentation at the Third World Materials Research Institute Forum and Energy Workshop held at NIST (June 22-25, 2009)
- Led ORNL's proposal efforts for DOE's Photovoltaic Manufacturing Initiatives
- US Photovoltaic Manufacturing Consortium with SEMATECH and University of Albany (awarded \$62.5 M in April 2011)
- Director of Technology**, Tennessee Solar Institute (December 2010 to present)
Promote and coordinate solar research and development efforts between faculty, staff, and scientists at UT and ORNL as well as engage various industry partners
Advise TN Governor Bredesen and the Department of Economic & Community Development on the direction of the Volunteer State Solar Initiative.
- Acting Solid State Lighting Program Manager**, ORNL (January 2009 to January 2011)
Coordinate and promote SSL research efforts across multiple directorates at ORNL.
- Research Staff Member**, Oak Ridge National Laboratory (May 2004 to present)
Pulse Thermal Processing Technology
Apply plasma arc lamp technology to the processing of semiconductor and photovoltaic material to improve performance and efficiency.
Lead Nanomanufacturing Initiative projects on thin film batteries and self-assembly.
Decontaminate large areas exposed to chemical and biological warfare substances.
Detect explosive material threats by rapid chemical volatilization of chemical residue.
- Senior Aeronautical Engineer**, Lockheed Martin, Marietta, GA (Feb 2002 to May 2004)
C-5 Galaxy Modernization Program
Design of cockpit panels and instrumentation.
Determination of critical aerodynamic and inertial loads during extreme maneuvers.
- Graduate Research Assistant**, Georgia Tech, Atlanta, GA (Fall 1997 to Fall 2001)
Design & construction of a novel laser chemical vapor deposition rapid prototyping system, capable of producing complex ceramic/metallic composite structures.
- Research Assistant**, Virginia Tech, Blacksburg, VA (Summer 1997)
Studied the tribological behavior of polymer dashboard components.

Cooperative Education Student, Du Pont, Richmond, VA (Fall 1994, Summer 1995 & 1996)

PATENTS: (5 applications pending)

- J. Xu, S-H Lee, D. Smith, X. Zhang, C. Duty. "Nanocone-Based Photovoltaic Solar Cells." Patent application filed April 2011.
- C. Duty, C. Bennett, J-W Moon, M. Hu, I. Ivanov, G.E. Jellison, L. Love, C. Parish, T. Phelps, S. Walker, Q. Dia, et al, "Pulse Thermal Method for Producing Thin Films, and Films Produced Thereby" Patent application filed April 2011
- A. Wereszczak, D. Harper, C. Duty "Glass Strengthening and Patterning Methods" Patent application 12/957,202 filed February 2011.
- C. Blue, A. Clemons, C. Duty, D. Harper, R. Ott, J. Rivard. "High Volume Method of Making Low-Cost, Lightweight Solar Materials." Patent application filed September 2010.
- C. Duty, I. Ivanov, L. Love, J-W Moon, T. Phelps, R. Lauf, "Microbially Facilitated Kesterite Formation for Solar Cell Devices" Invention Disclosure 201002446 filed August 14, 2010
- T. J. Phelps, R. J. Lauf, J. W. Moon, A. J. Rondinone, L. J. Love, C. E. Duty, A. S. Madden, Y. Li, I. N. Ivanov, and C. J. Rawn. "Microbially-Mediated Method for Synthesis of Non-oxide Metal Nanoparticles." U.S. Patent Application #12/364,638. Filed February 3, 2009.

SELECTED PUBLICATIONS: (49 Total, 15 primary)

- C. Duty, C. Bennett, A. Sabau, G.E. Jellison, P. Boudreaux, S. Walker, and R. Ott. "Advanced Method for Increasing the Efficiency of White Light Quantum Dot LEDs." Published online *Physica Status Solidi (a)* DOI:10.1002/pssa.201026674 (2011)
- Sethian JD, ..., Duty C, ..., et al "The Science and Technologies for Fusion Energy with Lasers and Direct-Drive Targets," IEEE Transactions on Plasma Science, **38** (4) p. 690-703, April 2010.
- G. E. Jellison, J. D. Budai, C. J. C. Bennett, J. Z. Tischler, C. E. Duty, V. Yelundur and A. Rohatgi, "High-Resolution X-Ray And Light Beam Induced Current (LBIC) Measurements Of Multicrystalline Silicon Solar Cells," 35th Photovoltaics Specialist Conference, Honolulu, Hawaii (June 2010).
- J.-W. Moon, C.E. Duty, L.J. Love, I.N. Ivanov, C.J. Rawn, A.J. Rondinone, R.J. Lauf, U.-L. Li, A.S. Madden, J.J. Mosher, S.M. Everett, and T.J. Phelps, "Scalable Production of Microbially-Mediated CdS Quantum Dots." Submitted to *Nanotechnology*, 2010.
- J.-W. Moon, M. Hu, C.E. Duty, L.J. Love, I.N. Ivanov, W. Wang, C.J., Rawn, J.J. Mosher, S. M. Everett, and T.J. Phelps. "Optical Enhancement of Microbially-Mediated CdS Quantum Dots." Submitted to *Journal of Nanoparticles Research*, 2010.
- A.A. Wereszczak, D.C. Harper, C.E. Duty, and P. Patel. "Glass Strengthening via High-Intensity Plasma-Arc Heating." **93** (5), *Journal of American Ceramic Society*, P 1256-1259 (2010).
- Q. Dai, C.E. Duty, and M.Z. Hu. "Semiconductor Nanocrystals-Based White Light Emitting Diodes." *Small* **6** (15) p1577-1588 (Aug 2010).
- R. Schoske, P. Kennedy, C. Duty, R. Smith, T. Huxford, A. Bonavita, G. Engleman, A. Vass, W. Griest, R. Ilgner, and G. Brown. "Decontamination Strategy for Large Area and/or Equipment Contaminated with Chemical and Biological Agents using a High Energy Arc Lamp (HEAL)." ORNL/TM-2009/088, Oak Ridge National Laboratory, April 2009.
- A. Sabau, C. Duty, R. Dinwiddie, M. Nichols, C. Blue, and R. Ott, "A Radiative Transport Model for Heating Paints using High Density Arc Lamps," *Journal of Applied Physics*, **105** (8), 2009.

HONORS:

- R&D100 Award for PulseForge 3100 with Pulse Thermal Processing (2009)
- Eugene P. Wigner Fellowship (2004)
- Sigma Xi Research Committee Award for Outstanding Ph.D. Thesis (2002)

- High Score on Ph.D. Qualifying Exams, Georgia Institute of Technology (1999)
- Eagle Scout (1991)