Education

- Ph.D. (Physics), University of Salerno, Italy, 1999
- M.S./B.S. (Physics) University of Naples "Federico II", Italy, 1994

Professional Experience

- 2001-present *Research Staff Scientist*, Materials Science and Technology, Oak Ridge National Laboratory
- 1999-2001 *Postdoctoral Research Associate*, Condensed Matter Sciences Division, Oak Ridge National Laboratory

Recent Awards:

- R&D 100 Award for high-temperature superconducting wires with double-perovskite, tantalate, nano-pinning centers, 2012
- R&D 100 Award for self-assembled, ferromagnetic-insulator nanocomposites for ultrahigh-density data storage, 2011.
- National FLC Award for flexible thin-film solar photovoltaics on RABiTS, 2011.
- R&D 100 Award for high-performance superconducting wires enabled via self-assembly of non-superconducting columnar defects, 2010.
- R&D 100 Award for development of round superconducting wires, 2009.
- ORNL Significant Event Award for development of round superconducting wires, 2009.
- ORNL Significant Event Award for development of IBAD-based 2G superconducting wires, 2008.
- R&D100 Magazine's MICRO/NANO Newsletter top 25 technologies, 2007.

Recent Publications:

1. A. F. May, M. A. McGuire, H. Cao, I. Sergueev, C. Cantoni, B. C. Chakoumakos, D. S. Parker, B. C. Sales, "Spin reorientation in TlFe1.6Se2 with complete vacancy ordering", *Phys. Rev. Lett*., (in press).
2. C. Cantoni , J. Gazquez , F. Miletto Granozio , M. P. Oxley ,M. Varela , A. R. Lupini , S. J. Pennycook , C. Aruta , U. Scotti di Uccio , P. Perna , and D. Maccariello "Electron transfer and ionic displacements as the origin of the 2d electron gas at the LAO/STO interface: direct measurements with atomic-column spatial resolution" *Advanced Materials* **24**, (2012) 3952.
3. S. Sathyamurthy, M. Paranthaman, H-Y. Zhai, S. Kang, C. Cantoni, S. Cook, L. Heatherly, A. Goyal, H. M. Christen "Solution Buffer Layers for YBCO Coated-Conductors" in "Fabrication of Long-Length and Bulk High-Temperature Superconductors" John Wiley & Sons Inc., **149** (2012) 1-8.
4. A. F. May, M. A. McGuire, C. Cantoni, B. C. Sales "Physical properties of $Ce_{3-x}Te_4$ below room temperature" *Phys. Rev. B* **86**, (2012) 035135.
5. J. Shin, A. Goyal, C. Cantoni, J. W. Sinclair, J. R. Thompson "Self-assembled ferromagnetic cobalt/yttria-stabilized zirconia nanocomposites for ultrahigh density storage applications" *Nanotechnology* **23**, (2012) 155602.
6. S.-H. Wee, C. Cantoni, Y. L. Zuev, E. D. Specht, A. Goyal "Phase stability of cubic pyrochlore rare earth tantalate pinning additives in

$YBa_2Cu_3O_{7-\delta}$ superconductor" Journal of the American Ceramic Society **95**, (2012) 1174.

7. H. Cao, C. Cantoni, A. F. May, M. A. McGuire, B. C. Chakoumakos, S. J Pennycook, R. Custelcean, A. S. Sefat, B. C. Sales "Evolution of the nuclear and magnetic structures of TlFe1.6Se2 with temperature" *Physical Review B* **83**, (2012) 224520.
8. S. H. Wee, C. Cantoni, T. R. Fanning, C. W. Teplin, D. F. Bogorin, J. Bornstein, K. Bowers, P. Schroeter, F. Hasoon, H. M. Branz, M. P. Paranthaman, and A. Goyal "Heteroepitaxial film silicon solar cell grown on Ni-W foils" *Energy & Environmental Science* **5***,* (2012) *6052-6056*.
9. C. Cantoni, Y. F. Gao, S. H. Wee, E. D. Specht, J. Gazquez, J. Y. Meng, S. J. Pennycook, and A. Goyal "Strain-driven oxygen deficiency in self-assembled, nanostructured, composite oxide films". *ACS Nano* **5**, (2011) 4783.
10. C. W. Teplin, M. P. Paranthaman, T. R. Fanning, K. Alberi, L. Heatherly, S.-H. Wee, K. Kim, F. A. List, J. Pineau, J. Bornstein, K. Bowers, D. F. Lee, C. Cantoni, S. Hane, P. Schroeter, D. L. Young, E. Iwaniczko, K. M. Jones, and H. M. Branz "Heteroepitaxial film crystal silicon on Al_2O_3 for solar cells on cube-textured metal foil". *Energy & Enviromental Science* **4,** (2011) 3346.
11. T. Aytug, Z. Chen, V. A. Maroni, D.J. Miller, C. Cantoni, E. D. Specht, A.J. Kropf, N. Zaluzec, Y. Zhang, Y. Zuev, M. Paranthaman "Fabrication and Characterization of Ce- and Ho-doped MOCVD $YBa_2Cu_3O_{6+\delta}$" *Journal of Applied Physics* **109**, (2011) 113923*.*
12. S. H. Wee, E. D. Specht, C. Cantoni, et al. "Formation of stacking faults and their correlation with flux pinning and critical current density in Sm-doped $YBa_2Cu_3O_{7-x}$ films" *Physical Review B* **83,** 224520 (2011).
13. P. Perna, D. Maccariello, M. Radovic, U. Scotti di Uccio, I. Pallecchi, M. Codda, D. Marré, C. Cantoni, J. Gazquez , M. Varela, S. J. Pennycook, and F. Miletto Granozio "Novel conducting interfaces between band insulating oxides" *Applied Physics Letters* **97**, (2010) 152111**.**
14. S. H. Wee, A. Goyal, E. D. Specht, C. Cantoni, Yuri L. Zuev, V Selvamanickam and S. Cook "Enhanced flux-pinning and critical current density via incorporation of self-assembled rare earth barium tantalite nanocolumns within $YBa_2Cu_3O_{7-\delta}$ films" *Physical Review B* **81**, (2010) 140503.
15. C. Cantoni "High-T_c Superconducting Thin and Thick-Film Based Coated Conductors for Energy Applications" in *Thin Film Metal-Oxides,* S. Ramanathan Ed. (Springer, New York 2010) ch. 7.
16. C. Cantoni "Nanomaterials for Superconductors from the Energy Perspective" in *Nanotechnology for the Energy Challenge,* J. Garcia-Martinez Ed. (Wiley-VCH, Weinheim 2010) ch. 9.
17. S. H. Wee, A. Goyal, Y. L. Zuev, C. Cantoni and E. D. Specht "Formation of self-assembled Ba_2YNbO_6 nanocolumns and their contribution to flux-pinning and J_c in Nb-doped $YBa_2Cu_3O_{7-\delta}$ films" *Applied Physics Express* **3**, (2010) 023101.

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20. S. H. Wee, J. Shin, C. Cantoni, Y. L. Zuev, S. Cook, and A. Goyal "Multifunctional, phase-separated, cap buffer layers for improved flux-pinning in $YBa_2Cu_3O_{7-\delta}$ based coated conductors" *Superconductor Science and Technology* **23**, (2010) 014007**.**

21. T. Aytug, M. Paranthaman, E. D. Specht, K. Kim, Y. L. Zuev, C. Cantoni, Y. Zhang, A. Goyal, D. K. Christen, V. A. Maroni, Y. Chen, and V. Selvamanickam "Enhanced Flux Pinning in MOCVD-YBCO Films through Zr-Additions: Systematic Feasibility Studies" *Superconductor Science and Technology* **23** (2010) 014005**.**

22. J. R. Thompson, J. W. Sinclair, D. K. Christen, Y. Zhang, Y. L. Zuev, C. Cantoni, Y. Chen, and V. Selvamanickam "Field, Temperature, and Angle Dependent Critical Current Density $J_c(H,T,\theta)$ in Coated Conductors via Contact-Free Methods" *Superconductor Science and Technology* **23,** (2010) 014002**.**

23. S. H. Wee, J. Shin, C. Cantoni, H. M. Meyer, S. W. Cook, M. P. Paranthaman, Y. L. Zuev, and A. Goyal, "Phase-Separated, Epitaxial, Nanostructured $LaMnO_3$+MgO Composite Cap Layer Films for Propagation of Pinning Defects in $YBa_2Cu_3O_{7-\delta}$ Coated Conductors" *Applied Physics Express* **2**, (2009) 063008.

24. Y. Zhang, E. D. Specht, C. Cantoni, D. K. Christen, J. R. Thompson, J. W. Sinclair, A. Goyal, T. Aytug, M. P. Paranthaman, Y. Chen, and V. Selvamanickam, "Magnetic field orientation dependence of flux pinning in $(Gd,Y)Ba_2Cu_3O_{7-x}$ coated conductor with tilted lattice and nanostructures" *Physica C: Superconductivity* **469**, (2009) 2044-2051.

25. C. Cantoni, E.D. Specht, A. Goyal, X. Li, M. Rupich, "Influence of oxygen deficiency on the out-of-plane tilt of epitaxial Y_2O_3 films on Ni–5%W tapes" *Journal of Materials Research* **24**, (2009) 520.

26. Y. Chen, V. Selvamanickam, Y. Zhang, Y. Zuev, C. Cantoni, E. Specht, M. P. Paranthaman, T. Aytug, A. Goyal, and D. Lee "Enhanced flux pinning by $BaZrO_3$ and $(Gd,Y)_2O_3$ nanostructures in metal organic chemical vapor deposited GdYBCO high temperature superconductor tapes" *Applied Physics Letters* **94**, (2009) 062513.

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28. Y. L. Zuev, E. D. Specht, C. Cantoni, D. K. Christen, J. R. Thompson, R. Jin, A. S. Sefat, D. G. Mandrus, M. A. McGuire, and B. C. Sales, "Aligned Crystallite

Powder of $NdFeAsO_{0.86}F_{0.14}$: Magnetic Hysteresis and Penetration Depth," *Physical Review B* **79**, (2009) 224523.