CAMDEN R. HUBBARD

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(Since joining ORNL in July, 1988)

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2. **C.R. Hubbard,** "Role of the PDF in Structure Solution by Powder Diffraction Methods," to be published for *Transactions of American Crystallographic Association*, 2002.

3. **Hubbard, C. R.,** J. R. Keiser, R. A. Peascoe "Pulp and Paper Plant Materials Issues Addressed by Xray and Neutron Diffraction Methods," to be published Proceedings 51st Annual Denver X-Ray Conference, July 29, August 8, 2002

4. Brewer, L.N., Northwestern University, R. A. Peascoe, **C. R. Hubbard,** and V. P. Dravid, "Residual Stress Distributions in the Solid Solution Eutectic, CO1-xNiXO/ZrO2(CaO)," *J. American Ceramic Society*, 2001.

5. Stoica, A. D., Xun-LI Wang, Mihai Popovici, and **C. R. Hubbard** , " Neutron Imaging with Bragg Mirrors," Submitted *Proceedings of SPIE*, San Diego, CA July 29-August 3, 2001.

6. Sutton, M.A., I. Abdelmajid, W. Zhao, D.-Q. Wang, and **C.R. Hubbard,** "Basic Studies of Welds in a Tank Car Steel: Residual Stress Measurements and Weld Characterization for TC-128B Plate Steel," Submitted to *ASME Journal of Pressure Vessel Technology ,* 2001

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95. Bragg Mirror Focusing Devices, A.D. Stoica,, M. Popovici, and **C.R. Hubbard,** ORNL/TM-2000/207

96. SURFING: A Program for Precise Determination of Sample Position in Stress Measurements Via Neutron Diffraction, Wang, D.-Q., **C.R. Hubbard**, and X.-L. Wang, ORNL Report: ORNL/TM-2000/200

97. Neutron Monochromators for Residual Stress Mapping at the New HB-2 Beamport, A. D. Stoica, M. Popovici, **C. R. Hubbard** and Spooner, ORNL/TM1999/277

98. RADFOCUS: A Program for Defining the Size of Diffracted Beam with a Radial Collimator in Stress and Texture Measurements by Neutron Diffraction, D.-Q. Wang, X.-L. Wang, J.L. Robertson, and **C.R. Hubbard**, ORNL/TM-1999/249

99. Residual Stress Determination for a Ferritic Steel Weld Plate, D.-Q. Wang, **C.R. Hubbard**, and S. Spooner, ORNL/TM-1999/141

100. Residual Stress Measurements Performed on the Grand Gulf Nuclear Power Station Reactor Core Shroud, S. Spooner, E.A. Payzant, X. Zhu, and **C.R. Hubbard**, Sandia Report SAND97-0034, Sandia National Laboratories, Albuquerque, NM (1997)

101. CRYSIZ: A Program for Computing Crystallite Size and Strain from the Broadening of Powder Diffraction Lines, **C.R. Hubbard**, B. Morosin, J.M. Stewart, ORNL/TM-13273 (1996)

102. XRAYL: A Program for Producing Idealized Powder Diffraction Line Profiles from Overlapped Powder Patterns, **C.R. Hubbard**, B. Morosin, J.M. Stewart, ORNL/TM-13272 (1996)

103. Effect of Surface Condition on Strength and Fatigue Behavior of Alumina Ceramic, A. E. Pasto, B. K. Cox, M. K. Ferber, **C. R. Hubbard**, M. L. Santella, W. A. Simpson, Jr., and T. R. Watkins, Technical Document 2584 (1993)

104. Comprehensive Review of the XRD Data of the Primary and Secondary Phases Present in the BSCCO Superconductor System (Part I: Ca-Sr-Cu-Oxides), B.J. Reardon and **C.R. Hubbard**, ORNL/TM-11948 (1992)

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Invited Presentations

1. "Progress in Solving Materials Problems in Pulp and Paper Plants," **C. R. Hubbard**, to be presented North Carolina State University, September 23, 2002.

2. "Pulp and Paper Plant Materials Issues Addressed by XRD Methods,**C. R. Hubbard**, R. A. Peascoe, and J.R. Keiser, ORNL, Annual Denver X-Ray Conference, Colorado Springs, CO., 7/29-8/2/2002.

3. "Engineering and Materials Science,"**C. R. Hubbard**, ORNL Neutron Science Day, Oak Ridge, TN, July 8, 2002

4. "Role of the PDF in Structure Solution by Powder Diffraction Methods,"**C. R. Hubbard**, ACA Annual Meeting, San Antonio, TX May 25-30, 2002

5. "" Thermal Expansion and Hydration of NaA10<->2</->," **C.R Hubbard,.**, Presented American Ceramic Society's 104th Annual Meeting and Exposition, St. Louis, Missouri, April 28-May 1, 2002.

6. "Developments in Neutron Diffraction Strain Mapping for Through Thickness Characterization of Weldments," **C.R Hubbard,.**, Presented Presented International Conference on rends in Welding Research, April 15-19, 2002

7. "Residual Stresses in bent Tubes and Alternative Clad Tubes," **C.R. Hubbard,** Presented Composite Tube Project Review Meeting, Atlanta, Georgia, February, 2002

8. "Qualitative XRD-use of the PDF for Beginners and Evolution of the ICDD," **C.R. Hubbard,** Presented AXAA National Conference, New Castle, NSW, Australia, Feb. 11-15, 2002.

9. In-Situ Diffraction Studies by X-ray and Neutron Diffraction," **C. R Hubbard,**.presented AXAA National Conference, New Castle, NSW, Australia, Feb. 11-15, 2002.

10. "Powder Diffraction File-Tradional, New and Future Usage for Computaiional Materials Science," **C. R. Hubbard**, Maui, Hawaii, Pac Rim IV, November 1, 2001

11. "Comparison of Refractory Performance in Black Liquor Gasifiers and a Smelt Test System," Roberta A. Peascoe, James R. Keiser, and **C. R. Hubbard**, ORNL; J. Peter Gorog and Craig A. Brown, Weyerhaeuser Company; and Bengt H. Nilsson, Chemrec AB, Karlstad,Sweden, International Chemical Recovery Conference, Whistler, BC, June 11-14, 2001

12. "Characterization Techniques for Transportation Materials," **C. R. Hubbard**, Metals & Ceramics, Thermo-Mechanical Treatments of Materials Conference, Indianapolis, IN, April 18, 2000.

13. "Precise Determination of Sample Position with a Radial Collimator and/or Slit(s) in Stress Measurements by Neutron Diffraction," D.-Q. Wang, X.-L. Wang and **C. R. Hubbard**, The Sixth International Conference on Residual Stresses, ICRS-6, July, 2000

14. "Improvement of Monochromator Design for Neutron Residual Stress Mapping," A. D. Stoica and M. Popovici, Missouri University Research Reactor, Columbus, MO; Steve Spooner, Solid State, and **C. R. Hubbard**,, The Sixth International Conference on Residual Stresses, ICRS-6, July, 2000

15. "Residual Stresses Around Cold Worked Holes Produced by the StressWaveTM Process" C. A. Meyer, S. Spooner, S. A. David, B. D. Flinn, E. T. Easterbrook and **C. R. Hubbard**, The Sixth International Conference on Residual Stresses, ICRS-6, July, 2000

16. "A Comparison of Measured and Calculated Residual Strain Tensors in a Single Pass Weld Overlay on Steel" S. Spooner, X.-L. Wang, Z. Feng, and **C. R. Hubbard**, The Sixth International Conference on Residual Stresses, ICRS-6, July, 2000

17. "Application of Coordinate System Conversion in Stress and Texture Measurements with Neutron Diffraction" D.-Q. Wang, **C. R. Hubbard** and S. Spooner, The Sixth International Conference on Residual Stresses, ICRS-6, July, 2000

18. "Shutter Failure Radiation Monitor Safety System," **Camden R. Hubbard** and Thomas R. Watkins, Metals & Ceramics, and Gerald K. Schulze, I&C Division, 49th Annual Denver X-ray Conference, Denver, CO, July 31-Aug 4, 2000

19. "Advanced Materials Characterization at the High Temperature Materials Laboratory User Facility," **C. R. Hubbard**, Metals & Ceramics, Invited Lecture at University of South Carolina, September 13, 2000.

20. "Progress in Standards Development for Neutron Diffraction Strain Mapping," **C. R. Hubbard**, Metals & Ceramics, ASM Heat Treating Society, St. Louis, MO, October 9-12, 2000.

21. "Structure and Lattice Expansion of Ti_3SiC_2" C. J. Rawn, W. D. Porter, E. A. Payzant and **C. R. Hubbard**, Metals & Ceramics; M. W. Barsoum and T. El-Raghy, Drexel University, the American Physical Society Centennial Meeting, Atlanta, GA, March, 1999

22. "High Temperature Neutron Powder Diffraction Study of Mo_5SiB_2 and $MoSi_2$" C. J. Rawn, C. M. Hoffmann, **C. R. Hubbard** and J. H. Schneibel, 48th Annual Denver X-ray Conference, Steamboat Springs, CO, August, 1999

23. "In-Situ Neutron Diffraction Measurement of the Residual Stress in Composite Tubing at Elevated Temperatures," X.-L. Wang, C. M. Hoffmann, C. H. Hsueh, G. Sarma, **C. R. Hubbard,** and J. R. Keiser, 48th Annual Denver X-ray Conference, Steamboat Springs, CO, August, 1999

24. "In-Situ Diffraction Studies for Electroceramics," **C.R. Hubbard**, E.A. Payzant and C.J. Rawn, Pittsburgh Diffraction Conference, Pittsburgh, PA, November, 1998

25. "Opportunities at DOE User Facilities for In Situ Diffraction" **C. R. Hubbard**, Pittsburgh Diffraction Conference, Pittsburgh, PA, November, 1998

26. "Scientific Collaboration Over the Internet at Neutron and X-Ray Beamlines," **C.R. Hubbard** and M.C. Wright; 47th Annual. Denver X-Ray Conf., Colorado Springs, CO, Aug. 3-7, 1998.

27. "Lattice Expansion and HT Structure of Ti_3SiC_2," Barsoum, M.W., and T. El-Raghy, Drexel University; C.J. Rawn, E.A. Payzant and **C.R. Hubbard**; 6th European Powder Diffraction Conference in Budapest, Hungary, (poster) August, 1998.

28. "Characterization of Welding Residual Stresses with Neutron Diffraction," X.-L. Wang, S. Spooner, **C.R. Hubbard**, Z. Feng, and B. Taljat; 1998 SEM Spring Conf. on Experimental and Applied Mechanics, Houston, TX, June 1998.

29. "Characterization of Welding Residual Stresses with Neutron Diffraction," X.-L. Wang, **C.R. Hubbard**; SEM Spring Conf. on Experimental and Applied Mechanics, Houston, TX, June 1-3, 1998.

30. "Materials Science & Engineering Applications of Neutron Scattering," **C. R. Hubbard**, Tennessee Chapter of the American Vacuum Society meeting, Knoxville, TN, May 21, 1998.

31. "High Temperature X-Ray Diffraction Characterization of Ti3SiC2," Rawn, C.J., and **C. R. Hubbard**, 100th Annual Meet/Expo Amer. Ceram. Soc, (poster), May 3-5, 1998.

32. "Lattice Expansion and HT Structure of Ti_3SiC_2," Barsoum, M. W., and T. El-Raghy, Drexel University; C. J. Rawn, E. A. Payzant and **C. R. Hubbard**; 6th European Powder Diffraction Conference in Budapest Hungary, (poster) August, 1998.

33. "Science at a Distance - Will the Internet Change Science Collaboration," M.C. Wright and **C.R. Hubbard**, ICDD Technical Committee Meeting, March 19, 1998.

34. "Engineering Materials Studies at HFIR and SNS,",**C. R. Hubbard**, Spallation Neutron Source and High Flux Isotope Reactor Workshop, Oak Ridge, TN, February 27, 1998.

35. "Diffraction, Residual Stress and Thermophysical Properties User Centers - High Temperature Materials Laboratory User Program at ORNL," **C. R. Hubbard**, Presented at General Motors Research Laboratory, Warren, MI, October 30, 1997.

36. "Diffraction, Residual Stress and Thermophysical Properties User Centers - High Temperature Materials Laboratory User Program at ORNL," **C. R. Hubbard,** Presented at Ford Motor SRL, Dearborn, MI, October 29, 1997.

37. "ORNL's Unique Residual Stress Facilities and Expertise," **C.R. Hubbard**, Allison Corp., Indianapolis, IN, October, 1997.

38. "In Situ Residual Stress Characterization of Curved Surfaces and at Elevated Temperatures," T. R. Watkins, **C. R. Hubbard** and E. A. Payzant, Annual Automotive Technology Development Customers' Coordination Meeting, Dearborn, MI, (poster) October 27-30, 1997.

39. "Through Thickness Residual Stress Mapping Facility Development and Example User Projects," **C. R. Hubbard**, E. A. Payzant, X. L. Wang, S. Spooner, and M. C. Wright, Annual Automotive Technology Development Customers' Coordination Meeting, Dearborn, MI, October 27-30, 1997.

40. "Neutron Radiography and Computed Tomography at Oak Ridge National Laboratory," D.A. Raine, III, **C. R. Hubbard,** P. M. Whaley, and M.C. Wright, 1997 ASNT Fall Conference, Pittsburgh, PA, October 20-24, 1997.

41. "Residual Stress Within Kraft Recovery Boiler Composite Tubes," X.-L. Wang, **C.R. Hubbard,** and S. Spooner, Denver X-ray Conference, Steamboat Springs, CO, August 4-8, 1997.

42. "Macro Residual Stress Mapping by Neutron Diffraction," **C. R. Hubbard**, Workshop on Applications of Neutron Scattering, Denver X-ray Conference, Steamboat Springs, CO, August 4, 1997.

43. "Interlamellar Stresses in NiO-ZrO2 (cubic) Directionally Solidified Eutectics (DSEs)", E.C. Dickey, V.P. Dravid, and **C.R. Hubbard**, St. Louis American Crystallographic Association Meeting, St. Louis, MO, July 24, 1997.

44. "Residual Stresses Due to Processing of Composite Tubes," X.-L. Wang and **C.R. Hubbard**; Proc. 5th Int. Conf. on Residual Stresses (ICRS-5), Linkoping, Sweden, June 1997