

## Robert E. Schwall

### External Refereed Publications

1. "Lippman Color Photography for the Undergraduate Laboratory", R. E. Schwall and P. D. Zimmerman, *Am. J. Phys.* **38**, 1345 (1970)
2. "Superconductivity in Layered Compounds with Variable Interlayer Spacings", F. J. DiSalvo, R. E. Schwall, T. H. Geballe, F. R. Gamble, and J. H. Osiecki, *Phys. Rev. Lett.* **27**, 301 (1971)
3. "Heat Capacity Measurements on Small Samples at Low Temperatures", R. Bachman, F. J. DiSalvo, T. H. Geballe, R. L. Greene, R. E. Howard, C. N. King, H. C. Kirsch, K. N. Lee, R. E. Schwall, H. U. Thomas, and R. B. Zubeck, *Rev. Sci. Instr.* **43**, 205 (1972)
4. "Superconductivity of  $\text{NbSe}_2$  to 140 kbar", T. F. Smith, L. E. Delong, A. R. Moodenbaugh, T. H. Geballe, and R. E. Schwall, *J. Phys. C. Solid State Phys.* **5**, L230 (1972)
5. "Fluctuation Effects in the Magnetic Transition of Superconducting Layered Compounds", D. E. Prober, M. R. Beasley, and R. E. Schwall, *Proceedings of Thirteenth International Conference on Low Temperature Physics (LT-13)*, Boulder, Colo, 1972., edited by K. D. Timmerhaus, W. J. O'Sullivan, and E. F. Hammel (Plenum Press, New York, 1974), **3**, p. 428.
6. "Studies of the Properties of the System  $\text{TaS}_{2-x}\text{Se}_x$ ", J. F. Revelli, W. A. Phillips, and R. E. Schwall. *Proceedings of Thirteenth International Conference on Low Temperature Physics (LT-13)*, Boulder, Colo, 1972., edited by K. D. Timmerhaus, W. J. O'Sullivan, and E. F. Hammel (Plenum Press, New York, 1974), **3**, p. 433.
7. "Preparation and Properties of 1T- $\text{TaSe}_2$ ", F. J. Disalvo, B. G. Bagley, R. G. Maines, J. V. Waszczak, and R. E. Schwall, *Solid State Comm.* **14**, 497 (1974).
8. "Pressure Enhanced Superconductivity in  $\text{NbSe}_2$ ", T. F. Smith, R. N. Shelton, and R. E. Schwall, *J. Phys F. Metal Phys.* **4**, 2009 (1974).
9. "Automated Small Sample Calorimeter", R. E. Schwall, R. E. Howard and G. R. Stewart, *Rev. Sci. Instr.* **46**, 1054 (1975).
10. "Evaluation of Layered  $\text{Nb}_3\text{Sn}$  Conductor", R. E. Schwall, R. E. Howard and R. B. Zubeck, *IEEE Trans. MAG-11*, 397 (1975)
11. "Superconductivity of  $\text{TaS}_{2-x}\text{Se}_x$  Layer Compounds at High Pressure", T. F. Smith, R. N. Shelton and R. E. Schwall, *J. Phys. F. Metal Phys.* **5**, 1713 (1975)
12. "High Pressure Metallic Phase in Cuprous Chloride Single Crystals", C. W. Chu, S. Early, T. H. Geballe, A. Rusakov and R.E. Schwall, *J. Phys. C. Solid State Phys.* **8**, I241 (1975).
13. "Low Temperature Specific Heat of Layered Compounds", R. E. Schwall, G. R. Stewart, and T. H. Geballe, *J. Low Temp. Phys.* **22**, 557 (1976).
14. "A Technique for Measuring ac Losses in Thin Film Superconductors", R. H. Norton, R. E. Howard and R. E. Schwall, *Advances in Cryogenic Engineering*, **22**, (Plenum, New York, 1977), pp414-419.

15. "Performance of Multifilamentary Nb<sub>3</sub>Sn Under Mechanical Load", D. S. Easton and R. E. Schwall, *Appl. Phys. Lett.* **29**, 319 (1976)
16. "Orpus 1 -- A Pulsed Superconducting Solenoid", R. E. Schwall, *IEEE Trans. MAG-13*, 31 (1977)
17. "Fluctuation-Induced Diamagnetism and Dimensionality in Superconducting Layered Compounds: TaS<sub>2</sub>(pyradine)<sub>1/2</sub> and NbSe<sub>2</sub>", D. E. Prober, M. R. Beasley and R. E. Schwall, *Phys. Rev. B15*, 5245 (1977).
18. "Superconductors for Tokamak Poloidal Field Coils", R. E. Schwall, S. S. Shen, J. W. Lue, J. R. Miller and H. T. Yeh, *Advances in Cryogenic Engineering*, **24**, (Plenum, New York, 1978), pp427-435.
19. "Fast Ramp Superconductor for Ohmic Heating Coils", M. S. Walker, B. A. Zeitlin and R. E. Schwall, *Proceedings of Seventh Symposium on Engineering Problems of Fusion Research*, edited by M. S. Lubell and C. Whitmire Jr. (IEEE, New York, 1977) p. 1310
20. "Losses and Transient Field Effects in Superconducting Cables for PF and TF Coils", S. S. Shen and R. E. Schwall, *Proceedings of Seventh Symposium on Engineering Problems of Fusion Research*, edited by M. S. Lubell and C. Whitmire Jr. (IEEE, New York, 1977) p. 1293
21. "Mechanical Design of Orpus 3", R. E. Schwall and W. H. Gray, *Proceedings of Seventh Symposium on Engineering Problems of Fusion Research*, edited by M. S. Lubell and C. Whitmire Jr. (IEEE, New York, 1977) p. 1326.
22. "Transient Loss Analysis and Measurements on Normal Conductors and Composite Superconductors", S. S. Shen and R. E. Schwall, *Proceedings of Seventh International Cryogenic Engineering Conference*, London, England, July 1978, (IPC Science and Technology Press LTD Surrey 1978), pp. 659-666
23. "Interaction of Transport Current and Transient External Field in Composite Conductors", S. S. Shen and R. E. Schwall, *IEEE Trans. MAG-15*, 232 (1979).
24. "Losses in Multifilamentary Nb<sub>3</sub>Sn Conductors Designed for High B Applications", G. R. Wagner, S. S. Shen, A. Petrovich, R. E. Schwall and M. S. Walker, *IEEE Trans. MAG-15*, 228 (1979).
25. "Properties and Performance of Fine Filament Bronze Process Conductors and Coils", M. S. Walker, J. M. Cutro, B. A. Zeitlin, G. M. Ozeryansky, R. E. Schwall, C. Oberly and J. Ho. *IEEE Trans. MAG-15*, 85 (1979).
26. "Reaction Treatment, Critical Current, Transition Temperature, and Bend Properties of a Niobium-Bronze Process Multifilamentary Superconductor", J. L. Martin, M.R. Daniel, J.M. Cutro, and R. E. Schwall, *IEEE Trans. MAG-15*, 185 (1980).
27. "Upper Critical Fields and Reduced Dimensionality of the Superconducting Layered Compounds", D. E. Prober, R. E. Schwall and M. R. Beasley, *Phys. Rev. B21*, 2717 (1980).
28. "Measurement of Heat Transfer and Helium Replenishment in Long Channels", R. E. Schwall, F. J. Reles and J. P. Heinrich, *Advances in Cryogenic Engineering*. **25**, (Plenum, New York, 1980), p. 406.

29. "Review of Superconductor Activities at IGC on A-15 Conductors", C. H. Rosner, B. A. Zeitlin, R. E. Schwall, M. S. Walker and G. M. Ozeryansky, *Filamentary A-15 Superconductors*, edited by M. Suenaga and A. F. Clark, (Plenum, New York, 1980), pp. 69-79
30. "Use of In-Situ Wire in Small Magnets", D. K. Finnemore, J. E. Ostenson, J. D. Verhoven, E. D. Gibson, and R. E. Schwall, *IEEE Trans. MAG-17*, 255 (1981).
31. "Physical, Mechanical and Electrical Properties of MF NbTi Superconductors", J. D. Scudiere, R. E. Schwall, K. A. Mortensen, D. W. Hazelton and B. A. Zeitlin, *IEEE Trans. MAG-17*, 912 (1981).
32. "Hydrostatic Extrusion of In-Situ Process Superconducting Wire for Use in NMR Magnets", D. W. Hazelton, R. E. Schwall, B. Avitzur and J. D. Verhoven, *Advances in Cryogenic Engineering* **28**, (Plenum, New York, 1982), pp. 545-553
33. "Aluminum Stabilized Multifilamentary NbTi Conductor", J. M Royet, J. D. Scudiere, and R. E. Schwall, *IEEE Trans. MAG-19*, 761 (1983).
34. "Fabrication of 20 KA, 12 T Conductor using External Bronze Process MF Nb<sub>3</sub>Sn", R. E. Schwall and G. M. Ozeryansky, *IEEE Trans. MAG-19*, 920 (1983)
35. "Properties and Performance of High Current Density Sn-Core-Processed MF Nb<sub>3</sub>Sn", R. E. Schwall, G. M. Ozeryansky and D. W. Hazelton, *IEEE Trans. MAG-19*, 1135 (1983)
36. "Critical Current and Upper Critical Field of Multifilament Nb<sub>(3-x)</sub>Ta<sub>x</sub>Sn Superconductor", R. E. Schwall, G. M. Ozeryansky, S. Foner, and E. J. McNiff Jr, *J. Appl. Phys.* **56**, 814 (1984).
37. "MRI -- Superconductivity in the Marketplace", R. E. Schwall, *IEEE Trans. MAG-23*, 1287 (1987)
38. "A 60 Cm. Bore 2.0 Tesla High Homogeneity Magnet for Magnetic Resonance Imaging", E. S. Bobrov, R. D. Pilsbury, Jr, W. F. B. Punchard, R. E. Schwall, H. R. Segal, J. E. C. Williams, and L. J. Neuringer, *IEEE Trans. MAG-23*, 1303 (1987)
39. "High Field Properties of Multifilamentary (Nb-4at%Ta)<sub>3</sub>Sn", S. Foner, E. J. McNiff, Jr, G. M. Ozeryanski, and R. E. Schwall, *IEEE Trans. MAG-23*, 984, (1987)
40. "Applications of High Temperature Superconductivity", A. P. Malozemoff, W. J. Gallagher, and R. E. Schwall, ACS Symposium Series, **351**, *Chemistry of High Temperature Superconductors*, edited by D. L. Nelson, M. S. Whittingham, and T. F. George (American Chemical Society, Washington D. C, 1987), Chap. 27, pp. 280-306.
41. "New Research Opportunities in Superconductivity", D.J. Scalapino, D. R. Clarke, J. Clarke, R. E. Schwall, A.F. Clark, and D.K. Finnemore, *Cryogenics*, **28**, 711 (1988)
42. "Protection System for Inductively Coupled Magnets", R.E. Schwall, *IEEE Trans. MAG-27*, 1700 (1991)
43. "Packaging and Cooling Low Temperature Electronics", R. E. Schwall and W. S. Harris, *Advances in Cryogenic Engineering*, **37**, 587 (Plenum, New York, 1992)
44. "Thermal Conductance of Cu/Cu and Cu/Si Interfaces from 85 K to 300 K", June Yu, A.L. Yee, and R.E. Schwall, *Cryogenics*, **32**, 610 (1992)

45. "Packaging Low Temperature Electronics for Commercial Applications", R.E. Schwall and W.S. Harris, *Proceedings of the Electrochemical Society* (1992).
46. "Stability Measurements on a 1-T High Temperature Superconducting Magnet", J. W. Lue, L. Dresner, S. W. Schwenterly, D. Aized, J. M. Campbell, R. E. Schwall, *IEEE Trans. on Applied Superconductivity*, **5**, 230, (1995).
47. "Quench Development in a High Temperature Superconducting Tape", J. W. Lue, M. S. Lubell, D. Aized, J. M. Campbell, and R. E. Schwall, *Cryogenics*, **41**, 433 (1996)
48. "Long Length Calorimetric Measurements Of AC Losses Of Bi-2223 With External Field Oriented Perpendicular To The Tape Width", G. Snitchler, J. Campbell, D. Aized, A. Sidi-Yekhlef, S. Fleshler, S. Kalsi, and R. E. Schwall, *IEEE Trans. on Applied Superconductivity*, **7**, 290, (1997).
49. "HTS SMES Magnet Design and Test Results", S.S. Kalsi, D. Aized, B. Connor, G. Snitchler, J. Campbell, R.E. Schwall, J. Kellers, Th. Stephanblome, and A. Tromm, *IEEE Trans. on Applied Superconductivity*, **7**, 971, (1997)
50. "WTEC Panel Report on Power Applications of Superconductivity in Japan and Germany", David Larbalestier, Richard D. Blaughter, Robert E. Schwall, Robert S. Sokolowski, Masaki Suenaga and Jeffery O. Willis, (International Technology Research Institute, Baltimore MD, 1997)
51. "Air Core HTS Motors for High Torque Applications", B.B. Gamble, S.S. Kalsi and R. E. Schwall, *Submarine Technology Symposium 1998*, (Johns Hopkins University MD 1998).
52. "High Field Warm-bore HTS Conduction Cooled Magnet", G. Snitchler, S.S. Kalsi, M. Manlief, R.E. Schwall, A. Sidi-Yekhlef, S. Ige, and R. Medeiros, *IEEE Trans on Applied Superconductivity*, **9**, 553, (1999)

### **US Patents Issued**

1. 4,689,707 "Superconductive magnet having shim coils and quench protection circuits ", Schwall; Robert E.
2. 4,970,868 "Apparatus for temperature control of electronic devices", Grebe; Kurt R; Schwall; Robert E.; Tong; Ho-Ming
3. 5,057,909 "Electronic device and heat sink assembly", Mok; Lawrence S; Schwall; Robert E. ; Tong; Ho-Ming
4. 5,169,805 "Method of resiliently mounting an integrated circuit chip to enable conformal heat dissipation" Mok; Lawrence S.; Schwall; Robert E.; Tong; Ho-Ming
5. 5,525,583 "Superconducting magnetic coil" Aized; Dawood; Schwall; Robert E.
6. 5,914,647 "Superconducting magnetic coil" Aized; Dawood; Schwall; Robert E.
7. 6,376,943 "Superconductor rotor cooling system", Gamble; Bruce B.; Sidi-Yekhlef; Ahmed; Schwall; Robert E.; Driscoll; David; Shoykhet; Boris A.