

# Carey E. Stronach

Professor of Physics & Director, Center for Interactive Micromagnetics  
Box 9325

Virginia State University  
Petersburg, VA 23806

Office: 804-524-5915; Fax: 804-524-5439; Home: 804-732-8993  
Internet: "cstronac@vsu.edu" or "stronach@triumf.ca"

## **Birth**

August 8, 1940; Boston, MA; United States citizen.

## **Degrees**

Ph.D., Physics, College of William and Mary, 1976; M.S., Physics, University of Virginia, 1963; B.S., Physics and Mathematics, University of Richmond, 1961.

## **Fields of Specialization**

Muon spin rotation studies of condensed matter, including superconductors, ferromagnets, weakly ordered magnetic systems, buckminsterfullerene, and quasicrystals; Medium-energy nuclear physics; Micromagnetics; Magnetic levitation; Physics education. US DOE Certification: Radiological Worker I & II.

## **Professional Employment**

Virginia State University: Professor, 1980-present; Associate Professor, 1976-78, 1979-80; Assistant Professor, 1966-71, 1972-76; Instructor, 1965-66; Member of VSU Graduate Faculty since 1976.

University of Alberta: Visiting Associate Professor, 1978-79.

Guest Scientist: Los Alamos National Laboratory, 1977-87; Brookhaven National Laboratory, 1983-89, 1995-98; Tri-University Meson Facility, 1978-present; National Superconducting Cyclotron Laboratory, 1993.

Associate: Physikon Research, Inc., Lynden, WA.

## **Honors**

Phi Beta Kappa; Sigma Xi; Sigma Pi Sigma (physics honorary society); Pi Mu Epsilon (mathematics honorary society); Robert E. Loving Award to outstanding physics graduate, University of Richmond, 1961. Who's Who in (i) The World (ii) America, (iii) Science and Engineering, (iv) American Education, and (v) The South & Southwest; recipient of the Patrick Henry Award from Governor James Gilmore, 2001.

## **Current Memberships**

American Physical Society; American Association of Physics Teachers; American Association for the Advancement of Science; Virginia Academy of Science; New York Academy of Sciences; International Society on Muon Science; Tri-University Meson Facility (TRIUMF) Users Group; The Planetary Society; National Association of Scholars; The Dramatists Guild, Inc.; Richmond Playwrights Forum; The Canada-Virginia Business Association; Charter Member, World War II Memorial Foundation.

## **Elective and Appointive Positions**

Board of Trustees, Southeastern Universities Research Association, 1983-98.

Chairman, *International Advisory Committee on Muon Spin Rotation*, 1999-, member 1996-99; Conference Chair, *Ninth International Conference on Muon Spin Rotation, Relaxation and Resonance*, Williamsburg, VA, June 2002; Scientific advisory committee, European Workshop on the Spectroscopy of Subatomic Species in Non-metallic Solids, Paris, France, September 1985; Local organizing committee, International Symposium on Clusters and Nano-Assemblies: From Physical to Life Sciences, Richmond VA, November 2003; Local organizing committee, *International Symposium on Cluster and Nanostructure Interfaces*, Richmond VA, October 1999; Local organizing committee, International Symposium on the Science and Technology of Atomically Engineered Materials, Richmond VA, October 1995; Local organizing committee, International Symposium: From Clusters to Crystals, Richmond VA, October 1991; Local organizing committee, International Symposium on the Physics and Chemistry of Small Clusters, Richmond VA, October 1986; Local organizing committee, International Symposium on the Electronic Structure and

Properties of Hydrogen in Metals, Richmond VA, March 1982. Advisory board, MarcoPolo Program, AAAS; Member: Governor's Advisory Council on Boards and Commissions, 1998-2002; The Commonwealth Council, 1998-2000; Board of Governors of the Virginia Association of Scholars, 1999-.

### **Fellowships and Scholarships**

NASA Summer Faculty Fellowship, Langley Research Center, 1976; NSF Science Faculty Fellowship, College of William and Mary, 1971-72; DuPont Fellowship, University of Virginia, 1961-63; Williams Scholarship, University of Richmond, 1957-61.

### **Grants**

Principal Investigator of: *Center for Interactive Micromagnetics*, 2001-present, supported by United States Air Force Office of Scientific Research; *Magnetic Materials Laboratory Development*, 1999-2001, supported by the US AFOSR; *Microscopic Characterization of Novel Magnetic Materials with Potential for Major Technological Impact*, 1997-2000, supported by the Ballistic Missile Defense Organization; *Muon Spin Rotation and Neutron Scattering Studies of Superconductors and Magnetically Ordered Systems Research Program*, VSU, 1997-2000, supported by the US AFOSR; *Mechanically Milled Iron Alloys for High-temperature Magnetic and Structural Applications Research Program*, VSU, 2000-present, supported by the US AFOSR;

Director of Solid State Physics Research Institute, VSU, 1984-87; Materials Science with Subatomic Particles Research Program, VSU, 1987-96, both supported by NASA;

Principal Investigator of Effects of Galactic Cosmic Radiation on Space Shielding Systems, VSU, 1993-96, supported by NASA; Characterization of Superconducting Materials with Muon Spin Rotation Research Program, VSU, 1988-97, supported by the US DOE; Helium Dilution Refrigerator for Superconductivity Research Equipment Grant, VSU, 1990-93, supported by US DOE; United States/France Muon Spin Rotation Research Program, VSU, 1985-89, supported by the NSF; Muon Spin Rotation Research Program, VSU, 1977-84, supported by NASA; Medium-Energy Nuclear Physics Research Program, VSU, 1972-81, supported by NASA; Nuclear Science Development Program, VSU, 1975-76, supported by HEW; Muon Spin Rotation research grant, President's National Research Council of Canada Fund, University of Alberta, 1978-79; Southern Regional Education Board travel grant, 1977-78.

### **Publications**

Muon Spin Rotation in  $\text{GdSr}_2\text{Cu}_2\text{RuO}_8$ : Implications: D.R. Harshman, J.D. Dow, W.J. Kossler, D.R. Noakes, **C.E. Stronach**, A.J. Greer, E. Koster, Z.F. Ren, D.Z. Wang; *Philosophical Magazine B*, submitted for publication.

Zero-Field  $\mu\text{SR}$  Study of  $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ ,  $x \geq 0.67$ : Evidence for Charge Ordering: J.E. Sonier, J.H. Brewer, R.F. Kiefl, R. Miller, R.H. Heffner, K.F. Poon, G.D. Morris, W.N. Hardy, R. Liang, D.A. Bonn, J.S. Gardner, **C.E. Stronach**; *Physica B* **326** (2003) 312-315.

Singlet Ground-state Fluctuations in Praseodymium Observed by Muon Spin Relaxation in  $\text{PrP}_x$ : D.R. Noakes, R. Wäppling, G.M. Kalvius, M.F. White, Jr., **C.E. Stronach**; *Journal of Physics Condensed Matter*, submitted for publication.

Correlations between Charge Ordering and Local Magnetic Fields in Overdoped  $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ : J.E. Sonier, J.H. Brewer, R.F. Kiefl, R.H. Heffner, K.F. Poon, S.L. Stubbs, G.D. Morris, R.I. Miller, W.N. Hardy, R. Liang, D.A. Bonn, J.S. Gardner, **C.E. Stronach**, N.J. Curro; *Physical Review B* **66** (2002) 134501.

Anomalous Weak Magnetism in Superconducting  $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ : J.E. Sonier, J.H. Brewer, R.F. Kiefl, R.I. Miller, G.D. Morris, **C.E. Stronach**, J.S. Gardner, S.R. Dunsiger, D.A. Bonn, W.N. Hardy, R. Liang, R.H. Heffner; *Science* **292** (2001) 1692.

Superconductivity and Magnetism in  $\text{Sr}_2\text{Y}(\text{Ru}_{1-u}\text{Cu}_u)\text{O}_6$  and in  $\text{Ba}_2\text{Gd}(\text{Ru}_{1-u}\text{Cu}_u)\text{O}_6$ : D.R. Harshman, W.J. Kossler, A.J. Greer, **C.E. Stronach**, D.R. Noakes, E. Koster, M.K. Wu, F.Z. Chien, H.A. Blackstead, J.D. Dow; *Proceedings of the Third International Conference on New Theories, Discoveries, and Applications of Superconductors and Related Materials (New3SC-3)*, Honolulu, January 2001.

Location and Properties of the Superconducting Hole-Condensate in  $\text{Sr}_2\text{YRu}_{1-u}\text{Cu}_u\text{O}_6$ : H.A. Blackstead, J.D. Dow, D.R.

Harshman, D.B. Pulling, W.J. Kossler, A.J. Greer, **C.E. Stronach**, E. Koster, B. Hitti, M.K. Wu, D.Y. Chen, F.Z. Chien; Proceedings of the Sixth International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Houston, February 2000, Physica C **341-348** (2000) 163.

Eu<sub>2-z</sub>Ce<sub>z</sub>Sr<sub>2</sub>Cu<sub>2</sub>RuO<sub>10</sub> Superconducts in its SrO layers, not in the Cuprate Planes: H.A. Blackstead, J.D. Dow, D.R. Harshman, I. Felner, D.B. Pulling, W.J. Kossler, A.J. Greer, **C.E. Stronach**, E. Koster, B. Hitti; Proceedings of the Sixth International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Houston, February 2000, Physica C **341-348** (2000) 165.

Magnetism and superconductivity in Sr<sub>2</sub>YRu<sub>1-u</sub>Cu<sub>u</sub>O<sub>6</sub> and magnetism in Ba<sub>2</sub>GdRu<sub>1-u</sub>Cu<sub>u</sub>O<sub>6</sub>: H.A. Blackstead, J.D. Dow, D.R. Harshman, M.J. DeMarco, M.K. Wu, D.Y. Chen, F.Z. Chien, D.B. Pulling, W.J. Kossler, A.J. Greer, **C.E. Stronach**, E. Koster, B. Hitti, M. Haka, S. Toorongian; European Journal of Physics B **15** (2000) 649.

Location of the Superconducting Hole Condensate in Sr<sub>2</sub>YRu<sub>1-u</sub>Cu<sub>u</sub>O<sub>6</sub> by  $\mu^+$ SR: D.R. Harshman, W.J. Kossler, A.J. Greer, **C.E. Stronach**, E. Koster, B. Hitti, M.K. Wu, D.Y. Chen, F.Z. Chien, H.A. Blackstead, J.D. Dow; Physica B **289-290** (2000) 360 .

$\mu$ SR Magnetic Properties of Stoichiometric and Under-stoichiometric PrP: D.R. Noakes, R. Wäppling, G.M. Kalvius, Y. Andersson, A. Broddefalk, M.F. White, Jr., **C.E. Stronach**; Physica B **289-290** (2000) 303.

$\mu$ SR Magnetic Response of CeCuSn: G.M. Kalvius, A. Kratzer, H. Nakotte, D.R. Noakes, **C.E. Stronach**, R. Wäppling; Physica B **289-290** (2000) 252.

Low Temperature Vortex Structures of the Mixed State in Underdoped Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+ $\delta$</sub> : T. Blasius, Ch. Niedermayer, D.M. Pooke, D.R. Noakes, **C.E. Stronach**, E.J. Ansaldo, A. Golnik, C. Bernhard; Physica B **289-290** (2000) 365.

Melting and Dimensionality of the Vortex Lattice in Underdoped YBa<sub>2</sub>Cu<sub>3</sub>O<sub>6.60</sub>: J.E. Sonier, J.H. Brewer, R.F. Kiefl, D.A. Bonn, J. Chakhalian, S.R. Dunsiger, W.N. Hardy, R. Liang, W.A. MacFarlane, R.I. Miller, D.R. Noakes, T.M. Riseman, **C.E. Stronach**; Physical Review B **61** (2000) R890.

Muon Spin Rotation in Sr<sub>2</sub>YRu<sub>1-x</sub>Cu<sub>x</sub>O<sub>6- $\delta$</sub> : D.R. Harshman, W.J. Kossler, A.J. Greer, **C.E. Stronach**, E. Koster, B. Hitti, M.K. Wu, D.Y. Chen, F.Z. Chien; Proceedings of the 2<sup>nd</sup> Annual Conference on New Theories, Discoveries, and Related Applications of Superconductors and Related Materials (1999), International Journal of Modern Physics B **13** (1999) 3670.

Cauchy Magnetic Field Component and Magnitude Distribution Studied by the Zero-field Muon Spin Relaxation Technique: X. Wan, W.J. Kossler, **C.E. Stronach**, D.R. Noakes; Hyperfine Interactions **122** (1999) 233.

Coexistence of Ferromagnetism and Superconductivity in the Hybrid Ruthenate-cuprate Compound RuSr<sub>2</sub>GdCu<sub>2</sub>O<sub>8</sub> Studied by Muon Spin Rotation and DC-magnetization: C. Bernhard, J.L. Tallon, Ch. Niedermayer, Th. Blasius, A. Golnik, E. Brücher, R.K. Kremer, D.R. Noakes, **C.E. Stronach**, E.J. Ansaldo; Physical Review B **59** (1999) 14099.

Zero-Field Muon Spin Rotation Study of Hole Antiferromagnetism in Low-Carrier-Density Y<sub>1-x</sub>Ca<sub>x</sub>Ba<sub>2</sub>Cu<sub>3</sub>O<sub>6</sub>: **C.E. Stronach**, D.R. Noakes, X. Wan, Ch. Niedermayer, C. Bernhard, E.J. Ansaldo; Physica C **311** (1999) 19.

Expansion of the Vortex Cores in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>6.95</sub> at Low Magnetic Fields: J.E. Sonier, R.F. Kiefl, J.H. Brewer, D. Bonn, S. Dunsiger, R. Liang, R.I. Miller, D.R. Noakes, **C.E. Stronach**; Physical Review B **59** (1999) R729 .

Temperature Dependence of the Muon Spin Relaxation in Pr<sub>1/2</sub>Sr<sub>1/2</sub>MnO<sub>3</sub>: R.I. Grynszpan, I. Savic, S. Romer, X. Wan, J. Fenichel, C.M. Aegerter, H. Keller, D.R. Noakes, **C.E. Stronach**, A. Maignan, C. Martin, B. Raveau; Physica B **259-261** (1999) 824.

Neutron Yields from 155 MeV/nucleon C and He Stopping in Al: L. Heilbronn, R.S. Cary, M. Cronqvist, F. Deák, K. Frankel, A. Galonsky, K. Holabird, Á. Horvath, Á. Kiss, J. Kruse, R. Ronningen, H. Schelin, Z. Seres, **C.E. Stronach**, J. Wang, P. Zecher, C. Zeitlin; Nuclear Science and Engineering **132** (1999) 1.

Ground-based Simulations of Cosmic Ray Heavy Ion Interactions in Spacecraft and Planetary Habitat Shielding Materials: J. Miller, C. Zeitlin, L. Heilbronn, T. Borak, T. Carter, K.A. Frankel, A. Fukumura, T. Murakami, S.E.

Rademacher, W. Schimmerling, **C.E. Stronach**; *Acta Astronautica* **42** (1998) 389.

Spin Dynamics and Freezing in Magnetic Rare-Earth Quasicrystals: D.R. Noakes, G.M. Kalvius, R. Wäppling, **C.E. Stronach**, M.F. White, Jr., H. Saito, K. Fukamichi; *Physics Letters A* **238** (1998) 197.

$\mu$ SR Measurement of the Fundamental Length Scales in the Vortex State of  $\text{YBa}_2\text{Cu}_3\text{O}_{6.60}$ : J.E. Sonier, R.F. Kiefl, J.H. Brewer, D.A. Bonn, S.R. Dunsiger, W.N. Hardy, R. Liang, W.A. MacFarlane, R.I. Miller, T.M. Riseman, D.R. Noakes, **C.E. Stronach**, M.F. White Jr.; *Physical Review Letters* **79** (1997) 2875.

Heavy Fragment Production Cross Sections from 1.05-GeV/nucleon  $^{56}\text{Fe}$  in C, Al, Cu, Pb and  $\text{CH}_2$  Targets: C. Zeitlin, L. Heilbronn, J. Miller, S.E. Rademacher, T. Borak, T.R. Carter, K.A. Frankel, W. Schimmerling, **C.E. Stronach**; *Physical Review C* **56** (1997) 388.

Magnetic Field Dependence of the London Penetration Depth in the Vortex State of  $\text{YBa}_2\text{Cu}_3\text{O}_{6.95}$ : J.E. Sonier, R.F. Kiefl, J.H. Brewer, D.A. Bonn, S.R. Dunsiger, W.N. Hardy, R. Liang, W.A. MacFarlane, T.M. Riseman, D.R. Noakes, **C.E. Stronach**; *Physical Review B* **55** (1997) 11789.

A Muon Spin Rotation Study of the Superconducting Condensate Density in High-Temperature Superconductors: Ch. Niedermayer, C. Bernhard, J.L. Tallon, G.V.M. Williams, J.I. Budnick, E.J. Ansaldo, **C.E. Stronach**, D.R. Noakes, C. Bucci, R. DeRenzi, G. Guidi; *Hyperfine Interactions* **105** (1997) 139.

Texture Effect on Vortex-State Transverse-Field  $\mu^+$ SR in Bi-2223 High- $T_c$  Materials: R.I. Grynszpan, P.L. Langlois, D.R. Noakes, **C.E. Stronach**, M.M. Granderson, E.J. Ansaldo, J.R. Brownstein, A.J. Hill, T.J. Bastow; *Hyperfine Interactions* **105** (1997) 95.

Pion-Nucleus Single Charge Exchange Induced by Stopped Negative Pion: R. Nair, H.S. Plendl, E.P. Gavathas, L.-C. Liu, R.J. Estep, B.J. Dropesky, J.D. Bowman, J.N. Knudson, B.J. Lieb, **C.E. Stronach**, H.O. Funsten, J. Mackenzie; *Physical Review C* **53** (1996) 811.

Magnetic Penetration Depth and Condensate Density of Cuprate High- $T_c$  Superconductors Determined by Muon-Spin Rotation Experiments: C. Bernhard, Ch. Niedermayer, U. Binniger, A. Hofer, Ch. Wenger, J.L. Tallon, G.V.M. Williams, E.J. Ansaldo, J.I. Budnick, **C.E. Stronach**, D.R. Noakes, M.-A. Blankson-Mills; *Physical Review B* **52** (1995) 10488.

Anisotropy and Dimensional Crossover of the Vortex State in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$  Crystals: C. Bernhard, C. Wenger, D.M. Pooke, J.L. Tallon, Y. Kotaka, K. Kishio, D.R. Noakes, **C.E. Stronach**, T. Sembiring, E.J. Ansaldo, Ch. Niedermayer; *Physical Review B* **52** (1995) R7050.

Moving Maglev Underground: **C. E. Stronach**; *Superconductor Industry* **8** (2) (1995) 6.

$\mu^+$ SR Study of the Effect of Zn Substitution on Magnetism in  $\text{YBa}_2\text{Cu}_3\text{O}_x$ : P. Mendels, H. Alloul, J.H. Brewer, G.D. Morris, T.L. Duty, S. Johnston, E.J. Ansaldo, G. Collin, J.F. Marucco, C. Niedermayer, D.R. Noakes, **C.E. Stronach**; *Physical Review B* **49** (1994) 10035.

$\mu^+$ SR Study of Zn Substitution in  $\text{YBa}_2\text{Cu}_3\text{O}_x$ : Is Hole Dynamics Affected?: P. Mendels, J.H. Brewer, H. Alloul, E.J. Ansaldo, D.R. Noakes, C. Niedermayer, G. Collin, J.F. Marucco, **C.E. Stronach**, G.D. Morris, T.L. Duty, S. Johnston; *Hyperfine Interactions* **86** (1994) 577.

Penetration Depths and Pinning in (BiPb)-2212 and (TlPb)-1212 - Universal Correlations Revisited: E.J. Ansaldo, J.J. Boyle, C. Niedermayer, H. Glückler, J.L. Tallon, A. Mawdsley, **C.E. Stronach**, D.R. Noakes, R.S. Cary, M.R. Davis, G.D. Morris; *Hyperfine Interactions* **86** (1994) 505.

Single Charge Exchange Following  $\pi$  Capture: H.S. Plendl, R. Nair, E. Gavathas, L.C. Liu, R.J. Estep, B.J. Dropesky, J.D. Bowman, J.N. Knudson, B.J. Lieb, **C.E. Stronach**, H.O. Funsten, J. Mackenzie; *Acta Physica Polonica B* **24** (1993) 1649.

Evidence for Endohedral Muonium in  $\text{K}_x\text{C}_{60}$  and Consequences for Electronic Structure: R.F. Kiefl, T.L. Duty, J.W.

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Observation of Magnetic Order in the Double-Layer System  $\text{La}_2\text{MCu}_2\text{O}_{6+\delta}$  (M = Ca, Sr): E.J. Ansaldo, C. Niedermayer, H. Glückler, **C.E. Stronach**, T.M. Riseman, R.S. Cary, D.R. Noakes, X. Obradors, A. Fuertes, J.M. Navarro, P. Gomez, N. Casañ, B. Martinez, F. Perez, J. Rodriguez-Carvajal, K. Chow; *Physical Review B* **46** (1992) 3084.

Formation of Muonium and a Muonic Radical in Fullerene: E.J. Ansaldo, J.J. Boyle, C. Niedermayer, G.D. Morris, J.H. Brewer, **C.E. Stronach**, R.S. Cary; *Physics and Chemistry of Finite Systems: From Clusters to Crystals, Vol. II*, P. Jena et al., eds., Kluwer Academic Publishers (1992) 1305.

Impurity Species Dependence of Zero-Field Muon Spin Rotation in Chromium Alloys: D.R. Noakes, E. Fawcett, E.J. Ansaldo, C. Niedermayer, **C.E. Stronach**; *Journal of Magnetism and Magnetic Materials* **114** (1992) 176.

Single Charge Exchange of Stopped  $\pi^-$  on Medium-Mass Nuclei: R. Nair, H.S. Plendl, E. Gavathas, L.C. Liu, R.J. Estep, B.J. Dropesky, J.D. Bowman, J.N. Knudson, B.J. Lieb, **C.E. Stronach**, H.O. Funsten, J. Mackenzie; *Progress at LAMPF*, K. Poelakker, ed., LA-12256-PR (1992) 57.

Muon-Spin-Relaxation Measurements of Magnetic Penetration Depth in Organic Superconductors  $(\text{BEDT-TTF})_2\text{-X}$ : X =  $\text{Cu}(\text{NCS})_2$  and  $\text{Cu}[\text{N}(\text{CN})_2]\text{Br}$ : L.P. Le, G.M. Luke, B.J. Sternlieb, W.D. Wu, Y.J. Uemura, J.H. Brewer, T.M. Riseman, **C.E. Stronach**, G. Saito, H. Yamochi, H.H. Wang, A.M. Kini, K.D. Carlson, J.M. Williams; *Physical Review Letters* **68** (1992) 1923.

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Coincidence Analyzing-Power Measurements of the Reaction  $^{12}\text{C}(\bar{p}, p'\gamma)^{12}\text{C}^*$  through the 15.11-MeV State: C.R. Lyndon, H.O. Funsten, C.F. Perdrisat, V. Punjabi, J.M. Finn, B.J. Lieb, **C.E. Stronach**, N.L. Fuqua, H.S. Plendl, J.R. Mackenzie, R. Nair, J.R. Comfort, R.A. Gianelli, J.J. Reidy, L. Redmond, P.E. Koehler, S.A. Wender; *Physical Review C* **45** (1992) 308.

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Superconductivity and Magnetic Order in Superoxygenated  $\text{La}_2\text{MCu}_2\text{O}_{6+\delta}$ : E.J. Ansaldo, C. Niedermayer, H. Glückler, **C.E. Stronach**, T.M. Riseman, R.S. Cary, D.R. Noakes, X. Obradors, A. Fuertes, J.M. Navarro, P. Gomez, N. Casañ, B. Martinez, F. Perez, J. Rodriguez-Carvajal, K. Chow; *Physica C* **185-189** (1991) 1213.

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Site of the Positive Muon in  $\text{YBa}_2\text{Cu}_3\text{O}_7$ : J.H. Brewer, R.F. Kiefl, J.F. Carolan, P. Dosanjh, W.N. Hardy, S.R. Kreitzman, Q. Li, T.M. Riseman, P. Schleger, H. Zhou, E.J. Ansaldo, D.R. Noakes, L.P. Le, G.M. Luke, Y.J. Uemura, K. Hepburn-Wiley, **C.E. Stronach**; *Hyperfine Interactions* **63** (1990) 177.

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The Superconducting Properties of  $\text{YBa}_2(\text{Cu}_{1-x}\text{M}_x)_3\text{O}_7$  for M = Zn and Ni: W.J. Kossler, X.H. Yu, A. Greer, H.E. Schone, **C.E. Stronach**, M.R. Davis, R.S. Cary, J.E. Crow, W.F. Lankford, J. Oostens; *Hyperfine Interactions* **63** (1990) 81.

Superconductivity and Magnetic Ordering in  $\text{YBa}_2(\text{Cu}_{1-x}\text{Fe}_x)_3\text{O}_7$ : W.J. Kossler, X.H. Yu, A. Greer, H.E. Schone, **C.E. Stronach**, M.R. Davis, R.S. Cary, W.F. Lankford, A.R. Moodenbaugh, J. Oostens; *Hyperfine Interactions* **63** (1990) 253.

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