Carlo Uberto Segre

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Google Scholar

Education

1981	Ph.D., Physics, University of California, San Diego
1977	M.S., Physics, University of California, San Diego
1976	B.S. *cum laude*, Physics, University of Illinois, Urbana-Champaign B.S. *cum laude*, Chemistry, University of Illinois, Urbana-Champaign

Appointments

2021-	Director, Materials Research Collaborative Access Team (MRCAT)
2021-	Professor of Materials Science and Engineering, Illinois Institute of Technology
2014-	Chief Technology Officer & Chief Financial Officer, Influit Energy, LLC
2012-	Director, Center for Synchrotron Radiation Research and Instrumentation, Illinois Institute of Technology
2011-	Duchossois Leadership Professor, Illinois Institute of Technology
2001-	Professor of Physics, Illinois Institute of Technology
2016-2019	Interim Chair, Department of Chemistry, Illinois Institute of Technology
2012-2021	Deputy Director, Biophysics Collaborative Access Team
2009-2011	Associate Dean for Graduate Admissions, Graduate College, Illinois Institute of Technology
2003-2009	Associate Dean for Special Projects, Graduate College, Illinois Institute of Technology
2002-2003	Associate Dean for Research, Armour College of Engineering and Science, Illinois Institute of Technology
1995-1999	Associate Chair, Department of Biological, Chemical and Physical Sciences, Illinois Institute of Technology
1994-2021	Deputy Director, Materials Research Collaborative Access Team (MRCAT)

1993-1995 Executive Chair for Chemistry, Department of Chemical and Biological Sciences, Illinois Institute of Technology

1993-1995 Joint Appointment as Associate Professor of Chemistry, Illinois Institute of Technology

1989-2001 Associate Professor of Physics, Illinois Institute of Technology

1990-1993 Staff Associate, International Centre for Science and High Technology, Trieste, Italy

1989-1990 Visiting Senior Scientist, International Centre for Theoretical Physics, Trieste, Italy

1983-1989 Assistant Professor of Physics, Illinois Institute of Technology

1981-1983 Postdoctoral Research Fellow, Department of Physics, Rutgers, the State University of New Jersey
Advisor: M.C. Croft

Awards and Recognition

- Fellow, American Association for the Advancement of Science (2013)
- Fellow of the International Centre for Diffraction Data (2006)
- IIT Sigma Xi Research Award, Senior Faculty Division (2014)
- IIT Faculty Research Fellowship 1985-1986
- Lewis College Junior Faculty Teaching Award 1985-1986
- NATO Postdoctoral Fellowship, 1983 (declined)
- Lyman Award, Department of Physics, University of Illinois, Urbana 1976
- Phi Beta Kappa
- Phi Kappa Phi

Society Memberships & Service

- American Physical Society
- American Association for the Advancement of Science
- American Chemical Society
- International X-ray Absorption Society
- Electrochemical Society
- Materials Research Society
- American Vacuum Society
- Sigma Xi
  - President IIT Chapter (2005-2016)
  - Director, North Central Region (2016-2022)

  - Executive Committee (2017-2019)
  - Member, Nominating Committee (2022-2026)
  - Member, Finance Committee (2023-)
- International Center for Diffraction Data
  - Chair Education Subcommittee (2005-2020)
  - Director At-Large (2020-2024)
- Advanced Photon Source
  - Member of the Advanced Photon Source Beamtime Allocation Committee (2007-2023)
  - Member, Steering Committee, APS User Organization (2018-2021)
  - Vice Chair, Steering Committee, APS User Organization (2018-2019)
  - Chair, Steering Committee, APS User Organization (2019-2020)
- Member Stanford Synchrotron Radiation Laboratory Triennial Review Committee (2014, 2017)
- Debian GNU/Linux Developer (2005-)
- Proposal reviewer for NSF, DOE, ARO, NIH, CRDF, Research Corporation, SSRL, CLS
- Reviewer for *Physical Review, Journal of Crystal Growth & Design*, *ACS Nano*, *Nanoscience & Nanotechnology Letters, Ionics, Journal of Physical Chemistry, Powder Diffraction, Journal of Alloys & Compounds, Journal of Synchrotron Radiation, Journal of Physics: Condensed Matter, Superconductor Science and Technology, Physical Chemistry Chemical Physics, Journal of Chemical Physics, Nano Energy, ACS Catalysis, Applied Catalysis, Applied Crystallography, Nuclear Instruments & Methods, Materials Research Express*

Teaching and Outreach Activities

Over the course of my career at IIT, I have had the opportunity to teach undergraduate courses at all levels and graduate courses specific to my research expertise. These include, Introduction to the Professions, General Physics I, II & III, Computational Physics, Instrumentation Laboratory, Solid State Physics, Modern Optics & Lasers, Introduction to Quantum Computing, Fundamentals of Quantum Theory I & II, Physical Chemistry I & III, Electronics for Analytical Chemists (graduate), Introduction to Synchrotron Radiation (graduate, also offered over Internet to students outside the United States). I have also been involved in several revisions of the physics curriculum to meet the needs of our majors and engineering students who take our general physics courses.

I have also been an instructor for the APS/IIT EXAFS Summer School since 2009 and I have twice been invited to be an instructor for the NSLS EXAFS Workshop (2006 & 2010). I annually offer an informal short course for IIT graduate students on EXAFS Theory and practice and I have offered the same short course to researchers at the Indian Institute of Science (Bangalore, India), Wright Patterson Air Force Base, and the Nissan Battery Group.

I have served as academic advisor to several hundred undergraduate students, including physics majors (undergraduates as well as professional Masters and first year M.S. and Ph.D. students), and undecided students in their first 2 years. More recently, I have become a mentor for the Duchossois Leadership Scholars program. This includes not only advising current scholars but also recruiting new scholars for the program.

Over my time at IIT, I have been able to successfully establish a number of new degree programs, including Professional Masters programs in Radiation Health Physics, where I served as co-Director and Interim Director at various times; Bachelor of Science programs in Physics Education and Applied Physics; and a Master of Science program in Applied Physics.

Outside the classroom, I have been faculty advisor to the Society of Physics Students, the IIT students responsible for the Chicago Area Undergraduate Research Symposium and the IIT Undergraduate Research Journal. For the past 30 years I have been webmaster, chair, and member of the International Bridge Building Committee, a competition for high school students.

In my role as a Debian GNU/Linux Developer, I have packaged scientific software for the Debian Linux and Ubuntu operating systems. Making these programs for scientific data analysis freely available to the broader scientific community.

Administrative Accomplishments

I have served as Interim Chair of The Chemistry Department (3 years), Associate Chair of the combined Biological, Chemical and Physical Sciences Department (6 years) and as Associate Dean for nearly 10 years in various positions. My major accomplishment as Associate Dean for Special Projects was the development of a framework and agreement for IIT/FermiLab joint faculty appointments at the Assistant Professor level. These were novel appointment agreements at the time but have proven to be successful and now are used as templates for joint positions with Argonne National Laboratory.

As Associate Dean for Graduate Admissions, I reorganized the Graduate Admissions Office and spearheaded the development of a fully electronic graduate application, evaluation, admission, and award system which integrates with the Banner academic computing system used by IIT and which is as advanced as any in the country.

In addition to developing and recruiting for the Duchossois Leadership Scholars program, I have also put together a framework for the Tang Fellowship program which recruits outstanding Chinese students and fully supports their Ph.D. studies at IIT.

Research Activities

I have been working in the field of materials science for over 40 years and have gained a broad experience in the preparation and characterization of bulk and thin film samples of complex superconducting, magnetic and mixed valence materials. My expertise spans the experimental techniques of x-ray diffraction, neutron diffraction and x-ray absorption spectroscopy as well as the structural analysis tools of total pattern fitting and Rietveld refinement of structural data. I also have experience in electron microscopy, resistivity, magnetic and Mössbauer effect measurements. There are three patent disclosures related to materials I have studied.

Beginning in 1989, I have devoted more of my effort to building IIT's presence in the Synchrotron Radiation community. These activities have resulted in a shift in my scientific interests which is now beginning to be reflected in my publication record.

- I am a founding member of IIT's Center for Synchrotron Radiation Research and Instrumentation (CSRRI);
- I have been on the Local Organizing Committee of the *1st International Conference on Synchrotron Radiation in Materials Science* (1996); the *10th International Conference on X-ray Absorption Fine Structure* (1998); and the *5thInternational Conference on Synchrotron Radiation in Materials Science* (2006).
- Since 1994, I have served as the IIT representative to the MRCAT Executive Committee, as Deputy Director of MRCAT and as supervisor to all of the MRCAT staff.

One of my principal areas of interest has been sample preparation of bulk materials, from arc-melting of ternary silicide superconducting and magnetic compounds to the sintering of ceramic superconductors and ferroelectrics. This includes the determination of the optimal synthesis conditions and both ternary and solid solution phase diagram determination. This extended to thin film growth, particularly the determination of ideal growth conditions

for highly oriented films of superconducting ceramic materials by pulsed laser deposition and the novel technique of electron spark deposition. An integral part of understanding the conditions for optimal synthesis is the structural characterization of the material. I have worked extensively on the solving of the crystallographic structure of complex oxides by powder neutron and x-ray diffraction using the technique of Rietveld refinement. I was involved in some of the original structural determinations of the high temperature superconducting compound $YBa_2Cu_3O_7$ and related materials.

More recently, I have been using synchrotron-related structural techniques such as X-ray Absorption Fine Structure (XAFS) and anomalous diffraction to get a better understanding of the local and medium range disorder which is usually an integral part of any ceramic superconductor or ferroelectric solid solution system. These techniques are also being applied to the structural characterization of thin films. My ultimate goal is to develop new ways of combining traditional average structural refinement with local structural probes such as XAFS in order to develop more accurate structural models for disordered systems.

I have been heavily involved in developing instrumentation for use at synchrotron radiation facilities, including the MRCAT beamlines, a bent Laue analyzer for fluorescence XAFS, a beam cleaner for harmonic rejection, and *in-situ* and *operando* electrochemical cells for the study of catalysis, fuel cells and batteries.

My current research projects include *in situ* XAFS on solid state and flow batteries and working fuel cell catalysts, phosphors, dilute magnetic semiconductors, and multiferroics. I have also been applying high energy x-ray diffraction and tomography to study cultural heritage artifacts. A recent ARPA-e award has taken my research in the direction of developing a new format of battery, combining the advantages of solid state and flow batteries, for electric vehicles. This has resulted in founding a startup, Influit Energy, LLC to commercialize this new technology. To date, we have obtained ~$16M in funding for this activity.

Recent Invited Presentations

2004 "Structural studies of nanoparticle catalysts in a fully operating Direct Methanol Fuel Cell," Illinois State University, Physics Department.

2006 "Structural studies of nanoparticle catalysts in a fully operating Direct Methanol Fuel Cell," University of North Dakota, Physics Department

"Structural studies of nanoparticle catalysts in a fully operating Direct Methanol Fuel Cell," University of Iowa, Physics Department

"X-ray absorption spectroscopy as in-situ characterization of catalysts in operating fuel cells," XV International Materials Research Congress, Cancun, Mexico.

"Fuel cell catalyst structural characterization by in-situ x-ray absorption spectroscopy," American Chemical Society Meeting, San Francisco.

"In-situ XAFS studies of fuel cell catalysts," NSLS Workshop on XAFS studies of nanoparticles and chemical transformations.

2007 "In-situ Spectroscopic Studies of Pb Corrosion," GNEP Advanced Materials Workshop, Oak Ridge National Laboratory.

2009 "Using x-ray absorption spectroscopy to probe the local structure of nano-scale systems," Nanotechnology Colloquium, NanoMaterials Application Center, Texas State University.

"Removal of oxygen adsorbates on Pt/C and PtNi(1:1)/C alloy nanoparticle catalysts for the oxygen reduction reaction in PEMFCs," XAFS 14 Conference, Camerino, Italy.

2010 "Using experimental and computational x-ray absorption spectroscopy to understand fuel cell catalysts," University of Delaware, Physics Department

"Using experimental and computational x-ray absorption spectroscopy to understand fuel cell catalysts," Daresbury Laboratory, UK.

2011 "X-ray Absorption Spectroscopy and applications to fuel cell catalysts," Wichita State University, Physics Department.

"X-rays in the Neighborhood: IIT and the Advanced Photon Source," Illinois Institute of Technology University Lecture.

2012 "Using x-ray physics to study catalysis at the MRCAT Beam Line," University of Illinois, Urbana-Champaign, Physics Department.

"Using x-ray physics to study catalysis at the MRCAT Beam Line," Wright-Patterson Air Force Base.

2013 "Using x-ray physics to study catalysis at the MRCAT Beam Line," Università di Padova, Italy, Chemical Engineering Department.

"Using x-ray physics to study catalysis at the MRCAT Beam Line," Università di Trento, Italy, Chemical Engineering Department.

"Surface science using x-ray and neutron sources," BP Distributed Research Laboratory meeting on surface science, BP Naperville.

"In situ and operando XAFS studies of fuel cell catalysts," BP Distributed Research Laboratory meeting on surface science, BP Naperville.

"In situ and operando XAFS studies of fuel cell catalysts," Illinois Institute of Technology, Chemistry Department Colloquium.

2014 "Using synchrotron radiation to study catalysis," Villanova University, Chemistry Department Colloquium.

"Can EXAFS help solve local structural questions in NPD and XRPD?," International center for Diffraction Data, March 2014 Meeting.

"The challenges of making flow batteries with nanoelectrofuel," Wichita State University, Physics Department Colloquium.

"Making an nanoelectrofuel flow battery," Illinois Institute of Technology, Mechanical, Materials and Aerospace Engineering Department Colloquium.

2015 "X-ray absorption spectroscopy as a structural probe of dynamics in fuel cell and battery systems," University of Notre Dame, Physics Department Condensed Matter Seminar.

"Rechargeable nanoelectrofuel flow batteries \\ for EV systems," University of Illinois at Chicago, Invited leecture for LAS 493. *J. Phys. Chem. C*, (in press 2021).

2016 "High energy density Nanoelectrofuel flow batteries for transportation and renewables: Development, prospective and challenges," American Institute of Chemical Engineers, Midwest Research Conference, Keynote Address.

"Designing improved materials for electrochemical energy applications," Illinois Insitute of Technology, Chemistry Department Colloquium.

"The science and engineering of Nanoelectrofuel flow battery development," Illinois Insitute of Technology, Physics Department Colloquium.

"The science and engineering of nanoelectrofuel flow battery development," Illinois State University, Physics Department Colloquium.

"X-ray absorption spectroscopy as a structural probe of dynamics in fuel cell and battery systems," University of Illinois at Chicago, Chemical Engineering Department Colloquium.

"The science and engineering of Nanoelectrofuel flow battery development," VIllanova University, Chemistry Department Colloquium.

"How do we design improved materials for electrochemical energy applications?" NGenE 2016, University of Illinois at Chicago.

2017 "What's a physicist doing speaking at an analytical chemistry seminar?" University of Iowa, Chemistry Department Analytical Chemistry Seminar.

2018 "Nanoelectrofuel flow batteries for transportation: How to start a battery company," Southern Illinois University, Carbondale, Sigma Xi Lecture.

"In situ characterization of battery materials using x-ray absorption spectroscopy," American Physical Society March Meeting, Invited Talk.

"In situ characterization of battery materials using x-ray absorption spectroscopy," National Synchrotron Light Source II User Meeting, Invited Talk.

2019 "When can't crystallography be trusted? The case of hexagonal YMO_3-type chromophores," Illinois Institute of Technology, Chemistry Department Colloquium.

2021 "Enhancing cobalt-free lithium-ion cathode performance through doping, surface coating, and heat treatment," Illinois Institute of Technology, Chemistry Department Colloquium.

"The consequences of local structure in hexagonal YMO_3–type chromophores," Global EXAFS Colloquium.

"X-ray absorption spectroscopy probes of energy-related mateerials," Boston College, Guest Lecture, Quantum Mechanics course.

"Probing battery chemistry with x-ray absorption spectroscopy," NASA Virtual Colloquium.

2022 "Effect of initial structure on high entropy oxide Li-ion anode materials," XAFS18, Virtual contributed talk.

"2022 Nobel Prize in Physics – Part 1," Illinois Institute of Technology, Physics Department Colloquium.

"Tuning Li-ion anode performance with high entropy oxides," Illinois Institute of Technology, Chemistry Department Colloquium.

"Spectroscopy at MRCAT after the APS-U," Advanced Photon Source User Meeting workshop.

"Tuning Li-ion anode performance with high entropy oxides," 2022 ESO Telluride Workshop on Entropy-Stabilized Oxides, Invited talk.

Graduate Students Supervised

Ph.D.

1987 K. Zhang - *Structure and Superconductivity of High Transition Temperature Copper Oxides.*

1991 K.J. Akujieze - *Structural and Electronic Studies of Pure and Lead-Doped Phases of the Single Cu-O layer Bi-Sr-Cu-O System.*

1991 D.T. Marx - *Structures and Superconductivity in Perovskite Bismuthate Systems.*

1992 P.G. Radaelli - *Oxygen Ordering and Superconductivity in Pure and Calcium-Substituted* $REBa_2Cu_3O_{6+x}$ *Systems*.

1994 Z. Wang - *Flux Dynamics in Type-II Superconductors*.

1995 R.K. Zasadzinski - *Studies of Superconductors Using a Low-Temperature Scanning Tunneling Microscope.*

1996 B. Ma - *Electrical Transport Properties and Defect Structure in the Sr-Fe-Co-O System*.

1999 A. Cansiz - *Force, Stiffness and Hysteresis Losses in High Temperature Superconducting Bearings*.

2003 N.E. Leyarovska - *X-ray Spectroscopy of Manganese-Based Single-Molecule Magnets.*

2007 S. Stoupin - *Manganese Incorporation into Ferroelectric Lead Titanate.*

2009 S. Liu - *X-ray Absorption Studies of Materials for Advanced Nuclear Reactors.*

2009 T. Brennan - *On the Variation of Sonoluminescence Flash Timing.*

2010 Q. Jia - *In situ XAFS Studies of the Oxygen Reduction Reaction on Carbon Supported Platinum and Platinum Nickel Nano-Scale Alloys as Cathode Catalysts in Fuel Cells.*

2012 H. Ganegoda - *Iron Incorporation into Ferroelectric Lead Titanate*

2013 M. Wojcik - *Fabrication and Characterization of High Aspect Ratio Hard X-ray Zone Plates with Ultrananocrystalline Diamond Molds*

2015 C. Pelliccione - *In Situ X-ray Absorption Spectroscopy Study of Sn and* SnO_2 *Anode Nanomaterials for Lithium-Ion Batteries*

2018 M. Sangroula - *Coupling Impedance Measurement and Analysis of Critical Vacuum Chamber Components for the Advanced Photon Source Upgrade*

2018 S. Aryal - *Structural Studies of Degradation Mechanism of Lithium Rich Manganese, Nickel, and Iron Based Cathodes*

2019 H. Saglam - *Spin Transport and Spin-Orbit Torques in Antiferromagnets*

2019 Y. Ding - *In Situ X-ray Absorption Spectroscopy Study of Tin-Based Graphite Composite Anodes for Lithium-Ion Batteries*

2020 E. Moazzen - *Nanomaterials for Advanced Battery Cathodes*

2021 K. Kucuk - *Investigation of structure and processing effects on the electrochemical performance of Lithium- and Manganese-rich, layered-oxide cathodes for LIBs*

2023 O.J. Marques - *High-entropy stabilization as a designing tool for Li-ion electrodes*

M.S.

1989 M.S. Kleefisch - *The Thermal Decomposition of an Alternative Precursor to* $YBa_2Cu_3O_7$.

1997 T. Bolin - *The Dielectric Constant and Stability of Nafion-Ceramic Composite Thin Films*.

2010 L. Melo - *X-Ray Diffraction and Fluorescence Analysis of Ancient Axe Heads.*

2017 N. Goldring - *Finite Element Analysis of High Heat Load Deformation and Mechanical Bending Correction of a Beamline Mirror for the APS Upgrade.*

2017 N. Beaver - *In situ XAS of Molybdenum Dichalcogenides as Li-Ion Battery Anodes*

Publications - Carlo U. Segre

Archival Journal Articles

1. "Bound-state wave packets," C.U. Segre and J.D. Sullivan, *Am. J. Phys.* **44**, 729-732 (1976).

2. "Pressure enhanced superconductive and magnetic interactions in the system $(Er_{1-x}Ho_x)Rh_4B_4$," R.N. Shelton, C.U. Segre, and D.C. Johnston, *Solid State Commun.* **33**, 843-846 (1980).

3. "The superconductivity of $Sc_4T_5Si_{10}$ (T=Co,Rh,Ir) and isomorphous compounds," H.F. Braun and C.U. Segre, *Solid State Commun.* **35**, 735-738 (1980).

4. "Hydrostatic pressure effects on the superconducting properties of $Ag_{1-x}Sn_{1+x}Se_2$," R.N. Shelton, C.U. Segre, and D.C. Johnston, *Solid State Commun.* **39**, 797-800 (1981).

5. "Susceptibility and Mössbauer studies of magnetic rare earth-iron-silicides," H.F. Braun, C.U. Segre, F. Acker, M. Rosenberg, S. Dey, and P. Deppe, *J. Magn. Magn. Mat.* **25**, 117-123 (1981).

6. "Reentrant superconductivity in $Tm_2Fe_3Si_5$," C.U. Segre and H.F. Braun, *Physics Letters* **85A**, 372-374 (1981).

7. "Configurational crossover for Eu systems: a simple model," M. Croft, E. Kemly, and C.U. Segre, *Solid State Commun.* **44**, 1025-1029 (1982).

8. "Valence instability in $Eu(Pd_{1-x}Au_x)_2Si_2$: the global phase diagram," C.U. Segre, M. Croft, J.A. Hodges, V. Murgai, L.C. Gupta, and R.D. Parks, *Phys. Rev. Lett.* **49**, 1947-1950 (1982).

9. "Neutron-diffraction study of magnetically ordered $Er_2Fe_3Si_5$," A.R. Moodenbaugh, D.E. Cox, C.B. Vining, and C.U. Segre, *Phys. Rev. B* **29**, 271-277 (1984).

10. "Ce valence variation in intermetallic alloys: L_{III} absorption spectroscopy results," R.A. Neifeld, M.C. Croft, C.U. Segre, and S. Raaen, *Phys. Rev. B* **30**, 4164-4169 (1984).

11. "Specific heat and critical field for some iron containing superconductors," G.R. Stewart, G.P. Meisner, and C.U. Segre, *J. Low Temp. Phys.* **59**, 237-240 (1985).

12. "Chemical environment and Ce valence: global trends in transition-metal compounds," R.A. Neifeld, M.C. Croft, B. Qi, J.B. Zhou, I. Perez, H. Jhans, T. Mihalisin, C.U. Segre, M. Madigan, M.S. Torikachvili, M.B. Maple, and L.E. DeLong, *Phys. Rev. B* **32**, 6928-6931 (1985).

13. "New superconducting phases in the Y-Os-Si system," L. Schellenberg, H.F. Braun, C.U. Segre, M. Gueramian, and J.Muller, *Jap. J. Appl. Phys.* **26**, 963-964 (1987).

14. "Magnetic properties of $Er_2Fe_{14}B$ and $Nd_2Fe_{14}B$ thin films," J.F. Zasadzinski, C.U. Segre, and E.D. Rippert, *J. Appl. Phys.* **61**, 4278-4280 (1987).

15. "Structure and crystal chemistry of the high T_C superconductor $YBa_2Cu_3O_{7-\delta}$," W.I.F. David, W.T.A. Harrison, J.M.F. Gunn, O. Moze, A.K. Soper, P.Day, J.D. Jorgensen, M.A. Beno, D.W. Capone II, D.G. Hinks, I.K. Schuller, L. Soderholm, C.U. Segre, K. Zhang, and J.D. Grace, *Nature* **327**, 310-312 (1987).

16. "Phase diagram and superconductivity in the Y-Ba-Cu-O system," D.G. Hinks, L. Soderholm, D.W. Capone II, J.D. Jorgensen, I.K. Schuller, C.U. Segre, K. Zhang, and J.D. Grace, *Appl. Phys. Lett.* **50**, 1688-1690 (1987).

17. "Structure of the single phase high temperature superconductor $YBa_2Cu_3O_7$," M.A. Beno, L. Soderholm, D.W. Capone II, D.G. Hinks, J.D. Jorgensen, J.D. Grace, I.K. Schuller, C.U. Segre, and K. Zhang, *Appl. Phys. Lett.* **51**, 57-59 (1987).

18. "Electronic and magnetic properties of rare-earth ions in $REBa_2Cu_3O_{7-\delta}$ (RE=Dy,Ho,Er)," B.D. Dunlap, M. Slaski, D.G. Hinks, L. Soderholm, M. Beno, K. Zhang, C.U. Segre, G.W. Crabtree, W.K. Kwok, S.K. Malik, I.K. Schuller, J.D. Jorgensen, and Z. Sungaila, *J. Magn. Magn. Mat.* **68**, L139-L144 (1987).

19. "Structural phase transition in $YBa_2Cu_3O_{7-\delta}$: the role of dimensionality in high temperature superconductivity," I.K. Schuller, D.G. Hinks, M.A. Beno, D.W. Capone II, L. Soderholm, J.-P. Locquet, Y. Bruynseraede, C.U. Segre, and K. Zhang, *Solid State Commun.* **63**, 385-388 (1987).

20. "Incorporation of Pr in $YBa_2Cu_3O_{7-\delta}$: electronic effects on superconductivity," L. Soderholm, K. Zhang, D.G. Hinks, M.A. Beno, J.D. Jorgensen, C.U. Segre, and I.K. Schuller, *Nature* **328**, 604 (1987).

21. "Oxygen ordering and superconductivity in $La(Ba_{2-x}La_x)Cu_3O_{7+\delta}$," C.U. Segre, B. Dabrowski, D.G. Hinks, K. Zhang, J.D. Jorgensen, M.A. Beno, and I.K. Schuller, *Nature* **329**, 227-229 (1987).

22. "Oxygen ordering and the orthorhombic-to-tetragonal phase transition in $YBa_2Cu_3O_{7-\delta}$," J.D. Jorgensen, M.A. Beno, D. G. Hinks, L. Soderholm, K. Volin, R.L. Hitterman, J.D. Grace, I.K. Schuller, C.U. Segre, K. Zhang, and M.S. Kleefisch, *Phys. Rev. B* **36**, 3608-3616 (1987).

23. "Solubility and superconductivity in the $RE(Ba_{2-x}RE_x)Cu_3O_{7+\delta}$ (RE=Nd,Sm,Eu,Gd,Dy)," K. Zhang, C.U. Segre, B. Dabrowski, D.G. Hinks, I.K. Schuller, J.D. Jorgensen, and M. Slaski, *J. Phys. C* **20**, L935-L940 (1987).

24. "$La_{2-x}Sr_xCu_4$ and $YBa_2Cu_3O_{6.5}$: new high T_C superconducting oxides," L. Soderholm, D.W. Capone II, D.G. Hinks, J.D. Jorgensen, I.K. Schuller, J. Grace, K. Zhang, and C.U. Segre, *Inorg. Chim. Acta* **140**, 167-168 (1987).

25. "Magnetic ordering of Gd and Cu in superconducting and non-superconducting $GdBa_2Cu_3O_{7-\delta}$," B.D. Dunlap, M. Slaski, D.G. Hinks, K. Zhang, C.U. Segre, S.K. Malik, and E.E. Alp, *Phys. Rev. B* **37**, 592-594 (1988).

26. "Is the isotope effect in $YBa_2Cu_3O_{7-\delta}$ absent?", M. Grimsditch, T.O. Brun, R. Bhadra, B. Dabrowski, D.G. Hinks, J.D. Jorgensen, M.A. Beno, J.Z. Liu, H.B. Schuttler, C.U. Segre, L. Soderholm, B.W. Veal, and I.K. Schuller, *Phys. Rev. Lett.* **60**, 752 (1988).

27. "Raman scattering from high T_C superconductors," R. Bhadra, T.O. Brun, M.A. Beno, B. Dabrowski, D.G. Hinks, J.Z. Liu, J.D. Jorgensen, I.K. Schuller, C.U. Segre, L. Soderholm, B. Veal, J.M. Williams, K. Zhang, and M. Grimsditch, *Phys. Rev. B* **37**, 5142-5147 (1988).

28. "First order valence transition in $Eu(Pd_{0.9}Au_{0.1})_2Si_2$: an x-ray diffraction study," H. Jahns, M. Croft, E. Kemly, V. Murgai, B. Grier, and C.U. Segre, *Solid State Commun.* **66**, 1027-1030 (1988).

29. "Superconductivity in silicon-rich RE-Os-Si compounds," L. Schellenberg, H.F. Braun, C.U. Segre, M. Gueramian, B. Chabot, M. Decroux, D. Cattani, and J. Muller, *Physica C* **153-155**, 485486 (1988).

30. "Structural and magnetic properties of Fe impurities in $YBa_2Cu_3O_{7+\delta}$," B.D. Dunlap, J.D. Jorgensen, W.K. Kwok, C.W. Kimball, J.L. Matykiewicz, H. Lee,, and C.U. Segre, *Physica C* **153-155**, 1100-1104 (1988).

31. "Structural and superconducting properties of oxygen-deficient and doped $YBa_2Cu_3O_{7+\delta}$," J.D. Jorgensen, D.G. Hinks, H. Shaked, B. Dabrowski, B.W. Veal, A.P. Paulikas, L.J. Nowicki, G. Crabtree, W.K. Kwok, A. Umezawa, L.H. Nunez, B.D. Dunlap, C.U. Segre, and C.W. Kimball, *Physica B* **156**, 877879 (1990).

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