CURRICULUM VITAE

Valery Kiryukhin

Dept. of Physics and Astronomy
Rutgers, the State University of New Jersey
Piscataway, NJ 08854
Phone: (848) 445-8752
Fax: (732) 445-4343
E-mail: vkir@physics.rutgers.edu

EDUCATION

Ph.D. (Physics), Nov. 1997	**Princeton University**, Princeton, NJ
M.S., Sep. 1992	**Moscow Institute of Physics and Technology,** Moscow, Russia

PROFESSIONAL EMPLOYMENT

July 2011 – present	**Rutgers University**, Piscataway, NJ Professor, Dept. of Physics and Astronomy
July 2005 – June 2011	**Rutgers University**, Piscataway, NJ Associate Professor, Dept. of Physics and Astronomy
Sep. 1999 – June 2005	**Rutgers University**, Piscataway, NJ Assistant Professor, Dept. of Physics and Astronomy
Sep. 1997 - Aug. 1999	**Massachusetts Institute of Technology**, Cambridge, MA Postdoctoral Research Associate, Department of Physics
Sep. 1992 - Aug. 1997	**Princeton University**, Princeton, NJ Graduate Research Assistant, Department of Physics

GUEST RESEARCHER POSITIONS

May 2015 – Aug. 2015	**Brookhaven National Laboratory** Upton, NY Guest Researcher
Feb. 2009 - Aug. 2009	**Max Planck Institute for Solid State Research**, Stuttgart, Germany Guest Researcher
Oct. 2008 – Nov. 2008	**National Institute for Standards and Technology**, Gaithersburg, MD Guest Researcher, NIST Center for Neutron Research

AWARDS AND ACADEMIC HONORS

● 2014 Fellow, American Physical Society
● 2008 Friedrich Wilhelm Bessel Research Award, Alexander von Humboldt Foundation
● 2005 Rutgers University Board of Trustees Fellowship for Scholarly Excellence
● 2001 Alfred P. Sloan Foundation Fellowship Award
● 2001 NSF CAREER Grant Award.

OTHER PROFESSIONAL ACTIVITIES

● Reviewer, research projects at the Oak Ridge National Laboratory (ORNL), supported by the U.S. Department of Energy (DOE), Office of Basic Energy Sciences (BES), Materials Sciences and Engineering Division. April, 2021.
● Program Committee member, 2020 Annual Meeting of the American Physical Society Mid-Atlantic Section (December 4-6, 2020).
● Co-organizer, Telluride Science School Workshop "Enhanced functionalities in 4d and 5d Containing Materials from Large Spin-Orbit Coupling", Telluride, CO, June 23-27, 2020. Postponed.
● Proposal Review Panel member, National Synchrotron Light Source II, Brookhaven National Laboratory, 2018 – present.
● Co-organizer, Telluride Science School Workshop "Enhanced in 4d and 5d Containing Materials from Large Spin-Orbit Coupling", Telluride, CO, June 26-30, 2018.
● Program and Focus Session Committee member, 2017 Annual Meeting of the American Physical Society Mid-Atlantic Section (November 3-5, 2017).
● Beamline Advisory Team member, Integrated In-Situ and Resonant X-ray Studies Beamline (ISR), NSLS II, Brookhaven National Laboratory. (2012-2017).
● Neutron Science Review Committee Member, Oak Ridge National Laboratory (2013-2017).
● Proposal review panel, National Science Foundation, 2017, 2018.
● Proposal Development Team member for two NSLS II beamlines, "A Beamline for Integrated In-Situ and Resonant Hard X-ray Studies: Illuminating the Physics of Materials for the 21st Century (ISR)", and "A Beamline for Materials Physics and Processing (MPP)" (2010-2012.)
● Beam Time Allocation Committee (BTAC) member, NIST Center for Neutron Research (2009-present).
● Co-Organizer of "Complex Oxides" Focus Topic (APS Division of Materials Physics) for 2007 March Meeting of the American Physical Society.
● Proposal Review Panel Member, Advanced Photon Source, Argonne National Laboratory (2005-2008).
● Coordinator, Workshop on Science Opportunities using X-Rays and Split Gap High-Field Magnets, Argonne National Laboratory (June 8-9, 2006).
● Special Interest Group Representative (x-ray scattering and crystallography), Users Executive Committee, National Synchrotron Light Source, Brookhaven National Laboratory (2004-2005).
● Proposal Review Panel Member, the National Synchrotron Light Source, Brookhaven National Laboratory (2004-2007).
●Member of the Program Committee, 46th Annual Conference on Magnetism and Magnetic Materials, July 2001.
● Proposal Study Group, Cooperative Grants Program, U.S. Civilian Research and Development Foundation (CRDF), Washington DC, May 21-22, 1996.

● Proposal Study for the U.S. Department of Commerce (NIST), for Stanford Linear Accelerator Center (SSRL), and for the U.S. National Science Foundation, 1997—present. Proposal review panel for the CRDF, 2004.

PUBLICATIONS

92. P. Yadav, S. Lee, G. L. Pascut, J. Kim, M. J. Gutmann, X. Xu, B. Gao, S.-W. Cheong, V. Kiryukhin, S. Choi, "Noncollinear magnetic order, in-plane anisotropy, and magnetoelectric coupling in the pyroelectric honeycomb antiferromagnet $Ni_2Mo_3O_8$", *Phys. Rev. Research* **5**, 033099 (2023).

91. K. Park, J. Kim, S. Choi, S. Fan, C. Kim, D. G. Oh, N. Lee, S.-W. Cheong, V. Kiryukhin, Y. J. Choi, D. Vanderbilt, J. H. Lee, J. L. Musfeldt, "Spin–phonon interactions and magnetoelectric coupling in $Co_4B_2O_9$ (B = Nb, Ta)", *Appl. Phys. Lett*. **122**, 182902 (2023); doi:10.1063/5.0137903.

90. M. G. Kim, A. Barbour, W. Hu, S. B. Wilkins, I. K. Robinson, M. P. M. Dean, J. Yang, C. Won, S.-W. Cheong, C. Mazzoli, V. Kiryukhin, "Real-space observation of fluctuating antiferromagnetic domains", *Sci. Adv.* **8**, eabj9493 (2022); doi:10.1126/sciadv.abj9493.

89. K. Park, G. L. Pascut, G. Khanal, M. O. Yokosuk, Xianghan Xu, Bin Gao, M. J. Gutmann, A. P. Litvinchuk, V. Kiryukhin, S.-W. Cheong, D. Vanderbilt, K. Haule, and J. L. Musfeldt, "Band-Mott mixing hybridizes the gap in $Fe_2Mo_3O_8$", *Phys. Rev. B* **104**, 195143 (2021).

88. S. Choi, D. G. Oh, M. J. Gutmann, S. Pan, G. Kim, K. Son, J. Kim, N. Lee, S.-W. Cheong, Y. J. Choi, V. Kiryukhin, "Noncollinear antiferromagnetic order in the buckled honeycomb lattice of magnetoelectric $Co_4Ta_2O_9$ determined by single-crystal neutron diffraction", *Phys. Rev. B* **102**, 214404 (2020).

87. T. N. Stanislavchuk, G. L. Pascut, A. P. Litvinchuk , Z. Liu, Sungkyun Choi, M. J. Gutmann, B. Gao, K. Haule, V. Kiryukhin, S.-W. Cheong, and A. A. Sirenko, "Spectroscopic and first principle DFT+eDMFT study of complex structural, electronic, and vibrational properties of $M_2Mo_3O_8$ (M = Fe, Mn) polar magnets", *Phys. Rev. B* **102**, 115139 (2020).

86. N. Lee, D. G. Oh, S. Choi, J. Y. Moon, J. H. Kim, H. J. Shin, K. Son, J. Nuss, V. Kiryukhin, Y. J. Choi, "Highly nonlinear magnetoelectric effect in buckled-honeycomb antiferromagnetic $Co_4Ta_2O_9$", *Sci. Rep*. **10**, 12362 (2020). https://doi.org/10.1038/s41598-020-69117-5

85. S.-W. Cheong, M. Fiebig, W. Wu, L. Chapon, V. Kiryukhin, "Seeing is believing: visualization of antiferromagnetic domains", npj Quantum Materials (2020)5:3; https://doi.org/10.1038/s41535-019-0204-x

84. M. G. Kim, B. Winn, S. Chi, A. T. Savici, J. A. Rodriguez-Rivera, W. C. Chen, X. Xu, Y. Li, J. W. Kim, S.-W. Cheong, and V. Kiryukhin, "Spin-liquid-like state in pure and Mn-doped $TbInO_3$ with a nearly triangular lattice", *Phys. Rev. B* **100**, 024405 (2019).

83. A.A. Sirenko, P. Marsik, C. Bernhard, T.N. Stanislavchuk, V. Kiryukhin, S.-W. Cheong, "Teraherz vortex beam as a spectroscopic probe of magnetic excitations", *Phys. Rev. Lett*. **122**, 237401 (2019).

82. M. G. Kim, H. Miao, B. Gao, S.-W. Cheong, C. Mazzoli, A. Barbour, W. Hu, S.B. Wilkins, I.K. Robinson, M.P.M. Dean, V. Kiryukhin, "Imaging antiferromagnetic antiphase domain boundaries using

magnetic Bragg diffraction phase contrast", *Nature Communications* **9**, article number: 5013 (2018); doi: 10.1038/s41467-018-07350-3.

81. S.-W. Cheong, D. Talbayev, V. Kiryukhin, A. Saxena, "Broken symmetries, non-reciprocity, and multiferroicitiy", *npj Quantum Materials* (2018) 3:19 ; doi:10.1038/s41535-018-0092-5.

80. O.G. Danylchenko, R.E. Boltnev, V.V. Khmelenko, V. Kiryukhin, O.P. Konotop, D.M. Lee, N.V. Krainyukova, "Argon nanoclusters with fivefold symmetry in supersonic gas jets and superfluid helium", *J. Low Temp. Phys*. **187**, 156 (2017).

79. W. Ratcliff, J.W. Lynn, V. Kiryukhin, P. Jain, M.R. Fitzsimmons, "Magnetic structures and dynamics of multiferroic systems obtained with neutron scattering", *npj Quantum Materials* **1**, 16003 (2016), doi:10.138/npjquantmats.2016.3

78. T. Mauerer, M. Vogt, P.-H. Hsu, G.L. Pascut, K. Haule, V. Kiryukhin, J. Yang, S.-W. Cheong, W. Wu, M. Bode, "Visualizing anisotropic propagation of stripe domain walls in staircaselike transitions of $IrTe_2$", *Phys. Rev. B* **94**, 014106 (2016).

77. Y. Wang, G.L. Pascut, B. Gao, T.A. Tyson, K. Haule, V. Kiryukhin, S.-W. Cheong, "Unveiling hidden ferrimagnetism and giant magnetoelectricity in polar magnet $Fe_2Mo_3O_8$", *Sci. Rep.* **5**, 12268; doi: 10.1038/srep12268 (2015).

76. S.F. Blake, M.D. Watson, A. McCollam, S. Kasahara, R.D. Johnson, A. Narayanan, G.L. Pascut, K. Haule, V. Kiryukhin, T. Yamashita, D. Watanabe, T. Shibauchi, Y. Matsuda, A.I. Coldea, "Fermi surface of $IrTe_2$ in the valence-bond state as determined by quantum oscillations", *Phys. Rev. B* **91**, 121105(R) (2015).

75. D. Mazumdar, K. Haule, J.J. Yang, G.L. Pascut, B.S. Holinsworth, K.R. O'Neal, V. Kiryukhin, S.-W. Cheong, J.L. Musfeldt, "Optical evidence for bonding-antibonding splitting in $IrTe_2$", *Phys. Rev. B* **91**, 041105 (R) (2015).

74. S.-Z. Lin, X. Wang, Y. Kamiya, G.-W. Chern, F. Fan, D. Fan, B. Casas, Y. Liu, V. Kiryukhin, W.H. Zurek, C.D. Batista, S.-W. Cheong, "Topological defects as relics of emergent continuous symmetry and Higgs condensation of disorder in ferroelectrics", *Nature Physics* **10**, 970 (2014).

73. G.L. Pascut, T. Birol, M.J. Gutmann, J.J. Yang, S.-W. Cheong, K. Haule, V. Kiryukhin, "Series of alternating states with unpolarized and spin-polarized bands in dimerized $IrTe_2$", *Phys. Rev*. B **90**, 195122 (2014).

72. G.L. Pascut, K. Haule, M.J. Gutmann, S.A. Barnett, A. Bobmardi, S. Artyukhin, T. Birol, D. Vanderbilt, J.J. Yang, S.-W. Cheong, V. Kiryukhin, "Dimerization-induced cross-layer quasi-two-dimensionality in metallic $IrTe_2$", *Phys. Rev. Lett*. **112**, 086402 (2014).

71. J.W. Kim, Y. Kamiya, E.D. Mun, M. Jaime, N. Harrison, J.D. Thompson, V. Kiryukhin, H.T. Yi, Y.S. Oh, S.-W. Cheong, C.D. Batista, V.S. Zapf, "Multiferroicity with coexisting isotropic and anisotropic spins in $Ca_3Co_{2-x}Mn_xO_6$", *Phys. Rev. B* **89**, 060404(R) (2014).

70. S. Lee, M.T. Fernandez-Diaz, H. Kimura, Y. Noda, D.T. Adroja, S. Lee, J. Park, V. Kiryukhin, S.-W. Cheong, M. Mostovoy, J.-G. Park, "Negative magnetostrictive magnetoelectric coupling of $BiFeO_3$", *Phys. Rev. B* **88**, 060103 (R) (2013).

69. N.V. Krainyukova, R.E. Boltnev, E.P. Bernard, V.V. Khmelenko, D.M. Lee, V. Kiryukhin, "Observation of the fcc-to-hcp transition in ensembles of argon nanoclusters", *Phys. Rev. Lett*. **109**, 245505 (2012).

68. J. Jeong, E.A. Goremychkin, T. Guidi, K. Nakajima, G.S. Jeon, S.-A. Kim, S. Furukawa, Y.B. Kim, S. Lee, V. Kiryukhin, S-W. Cheong, J-G. Park, "Spin wave measurements over the full Brillouin zone of multiferroic $BiFeO_3$", *Phys. Rev. Lett*. **108**, 077202 (2012).

67. M. Ramazanoglu, M. Laver, W. Ratcliff II, S.M. Watson, W.C. Chen, A. Jackson, K. Kothapalli, Seongsu Lee, S.-W. Cheong, and V. Kiryukhin, "Local Weak Ferromagnetism in Single-Crystalline Ferroelectric $BiFeO_3$", *Phys. Rev. Lett*. **107**, 207206 (2011).

66. J. Park, S.-H. Lee, S. Lee, F. Gozzo, H. Kimura, Y. Noda, Y. J. Choi, V. Kiryukhin, S.-W. Cheong, Y. Jo, E. S. Choi, L. Balicas, G. S. Jeon, J.-G. Park, "Magnetoelectric feedback among magnetic order, polarization, and lattice in multiferroic $BiFeO_3$", *J. Phys. Soc. Japan* **80**, 114714 (2011).

65. M. Ramazanoglu, W. Ratcliff II, H. T. Yi, A. A. Sirenko, S.-W. Cheong, V. Kiryukhin, "Giant Effect of Uniaxial Pressure on Magnetic Domain Populations in Multiferroic Bismuth Ferrite", *Phys. Rev. Lett*. **107**, 067203 (2011).

64. N. Lee, Y. J. Choi, M. Ramazanoglu, W. Ratcliff II, V. Kiryukhin, and S.-W. Cheong, "Mechanism of exchange striction of ferroelectricity in multiferroic orthorhombic $HoMnO_3$ single crystals", *Phys. Rev. B* **84**, 020101(R) (2011).

63. M. Ramazanoglu, W. Ratcliff II, Y. J. Choi, Seongsu Lee, S.-W. Cheong, V. Kiryukhin, "Temperature-dependent properties of the magnetic order in single-crystal $BiFeO_3$", *Phys. Rev. B* **83**, 174434 (2011).

62. T. D. Kang, E. Standard, K. H. Ahn, A. A. Sirenko, G. L. Carr, S. Park, Y. J. Choi, M. Ramazanoglu, V. Kiryukhin, S.-W. Cheong, "Coupling between magnon and ligand-field excitations in magnetoelectric $Tb_3Fe_5O_{12}$ garnet", *Phys. Rev. B* **82**, 014414 (2010).

61. R. Flint, H.-T. Yi, P. Chandra, S.-W. Cheong, and V. Kiryukhin, "Spin-state crossover in multiferroic $Ca_3Co_{2-x}Mn_xO_6$", *Phys. Rev. B* **81**, 092402 (2010).

60. V. Kiryukhin, Seongsu Lee, W. Ratcliff II, Q. Huang, H.T. Yi, Y.J. Choi, S-W. Cheong, "Order by Static Disorder in the Ising Chain Magnet $Ca_3Co_{2-x}Mn_xO_6$", *Phys. Rev. Lett*. **102**, 187202 (2009).

59. T. Choi, S. Lee, Y. J. Choi, V. Kiryukhin, S.-W. Cheong, "Switchable Ferroelectric Diode and Photovoltaic Effect in $BiFeO_3$", *Science* **324**, 63 (2009).

58. Y.J. Jo, S. Lee, E.S. Choi, H.T. Yi, W. Ratcliff II, Y.J. Choi, V. Kiryukhin, S-W. Cheong, L. Balicas, "3:1 magnetization plateau and suppression of ferroelectric polarization in an Ising chain multiferroic", *Phys. Rev. B* **79**, 012407 (2009).

57. W. Wu, V. Kiryukhin, H.-J. Noh, K.-T. Ko, J.-H. Park, W. Ratcliff II, P.A. Sharma, N. Harrison, Y.J. Choi, Y. Horibe, S. Lee, S. Park, H.T. Yi, C.L. Zhang, S.-W. Cheong, "Formation of Pancakelike Ising Domains and Giant Magnetic Coercivity in Ferrimagnetic $LuFe_2O_4$", *Phys. Rev. Lett*. **101**, 137203 (2008).

56. S. Lee, T. Choi, W. Ratcliff II, R. Erwin, S-W. Cheong, V. Kiryukhin, "Single ferroelectric and chiral magnetic domain of single-crystalline $BiFeO_3$ in an electric field". *Phys. Rev. B* **78**, 100101(R) (2008).

55. S. Lee, W. Ratcliff II, S-W. Cheong, V. Kiryukhin, "Electric field control of the magnetic state in $BiFeO_3$ single crystals". *Appl. Phys. Lett.* **92**, 192906 (2008).

54. Y.J. Choi, H.T. Yi, S. Lee, Q. Huang, V. Kiryukhin, S-W. Cheong, "Ferroelectricity in an Ising Chain Magnet", *Phys. Rev. Lett.*, **100**, 047601 (2008).

53. S. Grenier, K.J. Thomas, J.P. Hill, U. Staub, Y. Bodenthin, M. Garcia-Fernandez, V. Scagnoli, V. Kiryukhin, S-W. Cheong, B.G. Kim, J.M. Tonnerre, "Direct Observation of Oxygen Superstructures in Manganites", *Phys. Rev. Lett*. **99**, 206403 (2007).

52. V. Kiryukhin, E.P. Bernard, V.V. Khmelenko, R.E. Boltnev, N.V. Krainyukova, D.M. Lee, "Noble-Gas Nanoclusters with Fivefold Symmetry Stabilized in Superfluid Helium", *Phys. Rev. Lett.* **98**, 195506 (2007).

51. M. Croft, V. Kiryukhin, Y. Horibe, S-W. Cheong, "Universality in one-dimensional orbital wave ordering in spinel and related compounds: an experimental perspective", *New Journal of Physics* **9**, 86 (2007).

50. S. Grenier, V. Kiryukhin, S-W. Cheong, B.G. Kim, J.P. Hill, K.J. Thomas, J.M. Tonnerre, Y. Joly, U. Staub, V. Scagnoli, "Observation of orbital ordering and Jahn-Teller distortions supporting the Wigner-crystal model in highly doped $Bi_{1-x}Ca_xMnO_3$", *Phys. Rev. B* **75**, 085101 (2007).

49. V. Kiryukhin, Y. Horibe, Y.S. Hor, H.J. Noh, S-W. Cheong, and C.H. Chen, "Incommensurate Structural Correlations in the Disordered Spin-Dimer State Induced by X-Ray and Electron Irradiation in $CuIr_2S_4$", *Phys. Rev. Lett*. **97**, 225503 (2006).

48. W. Ratcliff II, V. Kiryukhin, M. Kenzelmann, S.-H. Lee, R. Erwin, J. Schefer, N. Hur, S. Park, and S-W. Cheong, "Magnetic phase diagram of the colossal magnetoelectric $DyMn_2O_5$", *Phys. Rev. B* **72**, 060407(R) (2005).

47. N. Hur, S. Park, S. Guha, A. Borissov, V. Kiryukhin, S-W. Cheong, "Low-field magnetodielectric effect in terbium iron garnets", *Appl. Phys. Lett*. **87**, 042901 (2005).

46. S. Grenier, J. P. Hill, V. Kiryukhin, W. Ku, Y.-J. Kim, K. J. Thomas, S.-W. Cheong, Y. Tokura, Y. Tomioka, D. Casa, T. Gog, "*d-d* excitations in manganites probed by resonant inelastic x-ray scattering", *Phys. Rev. Lett.* **94**, 047203 (2005).

45. K. H. Kim, M. Uehara, V. Kiryukhin, S-W. Cheong, "Multi-scale Phase Modulations in Colossal Magnetoresistance Manganites", in *Colossal Magnetoresistive Manganites*, ed. T. Chatterji (Kluwer Academic Publishers, Dordrecht, 2004), p. 131-205. ISBN 1-4020-1844-4.

44. V. Kiryukhin, A. Borissov, J. S. Ahn, Q. Huang, J. W. Lynn, and S-W. Cheong, "Uncorrelated and correlated nanoscale lattice distortions in the paramagnetic phase of magnetoresistive manganites", *Phys. Rev. B* **70**, 214424 (2004).

43. V. Kiryukhin, "Nanoscale Structural Correlations in Magnetoresistive Manganites", *New Journal of Physics* **6**, 155 (2004). In Focus Issue on Orbital Physics, edited by B. Keimer and A.M. Oleś.

42. V. Podzorov, E. Menard, A. Borissov, V. Kiryukhin, J. A. Rogers, and M. E. Gershenson, “Intrinsic charge transport on the surface of organic semiconductors”, *Phys. Rev. Lett*. **93**, 086602 (2004).

41. S. Grenier, J. P. Hill, D. Gibbs, K. J. Thomas, M. v. Zimmermann, C. S. Nelson, V. Kiryukhin, Y. Tokura, Y. Tomioka, D. Casa, T. Gog, C. Venkataraman, “Resonant x-ray diffraction study of the magnetoresistant perovskite $Pr_{0.6}$ $Ca_{0.4}$ MnO_3”, *Phys. Rev. B* **69**, 134419 (2004).

40. E. P. Bernard, R. E. Boltnev, V. V. Khmelenko, V. Kiryukhin, S. I. Kiselev, and D. M. Lee, “Deuterium atoms and molecules in nanoclusters of molecular deuterium", *Phys. Rev. B* **69**, 104201 (2004).

39. G. Popov, M. V. Lobanov, E. V. Tsiper, M. Greenblatt, E. N. Caspi, A. Borissov, V. Kiryukhin, J. W. Lynn, “Crystallographic and magnetic structure of the Sr_2MnReO_6 double perovskite”, *J. Phys.: Condens. Matter* **16**, 135 (2004).

38. S. Grenier, K. J. Thomas, Y-J. Kim, J. P. Hill, Doon Gibbs, V. Kiryukhin, Y. Tokura, Y. Tomioka, D. Casa, T. Gog, C. Venkataraman, “Resonant X-ray scattering as a probe of the valence and magnetic ground state and excitations in $Pr_{0.6}Ca_{0.4}MnO_3$”, *Physica* **B 345**, 6 (2004).

37. E. P. Bernard, R. E. Boltnev, V. V. Khmelenko, V. Kiryukhin, S. I. Kiselev, and D. M. Lee, “Impurity-Helium Solids: Chemistry and Physics at 1.5 K”, *J. Low Temp. Phys.* **134**, 133 (2004).

36. E. P. Bernard, R. E. Boltnev, V. V. Khmelenko, V. Kiryukhin, S. I. Kiselev, and D. M. Lee, “ESR and X-ray Investigations of Deuterium Atoms and Molecules in Impurity-Helium Solids”, *J. Low Temp. Phys.* **134**,169 (2004).

35. M. Croft, W. Caliebe, H. Woo, T. A. Tyson, D. Sills, Y. S. Hor, S-W. Cheong, V. Kiryukhin, and S-J. Oh, “Metal-insulator transition in $CuIr_2S_4$: XAS results on the electronic structure”, *Phys. Rev. B* **67**, 201102 (2003).

34. V. Kiryukhin, T. Y. Koo, H. Ishibashi, J. P. Hill, and S-W. Cheong, “Average lattice symmetry and nanoscale structural correlations in magnetoresistive manganites", *Phys. Rev. B* **67**, 064421 (2003).

33. R. J. Christianson, Y. J. Wang, S. C. LaMarra, R. J. Birgeneau, V. Kiryukhin, T. Masuda, I. Tsukada, K. Uchinokura, B. Keimer, “An x-ray scattering study of the incommensurate phase in Mg-doped $CuGeO_3$”, *Phys. Rev. B* **66**, 174105 (2002).

32. H. Ishibashi, T. Y. Koo, Y. S. Hor, A. Borissov, P. G. Radaelli, Y. Horibe, S-W. Cheong, and V. Kiryukhin, “X-ray-induced disordering of the dimerization pattern and apparent low- temperature enhancement of lattice symmetry in spinel $CuIr_2S_4$”, *Phys. Rev. B* **66**, 144424 (2002).

31. P. G. Radaelli, Y. Horibe, M. J. Gutmann, H. Ishibashi, C. H. Chen, R. M. Iberson, Y. Koyama, Y-S. Hor, V. Kiryukhin, and S-W. Cheong, “Formation of isomorphic Ir^{3+} and Ir^{4+} octamers and spin dimerisation in the spinel $CuIr_2S_4$”, *Nature* (London) **416**, 155 (2002).

30. T. Y. Koo, P. M. Gehring, G. Shirane, V. Kiryukhin, G. Lee, S-W. Cheong, “Anomalous transverse acoustic phonon broadening in the relaxor ferroelectric $Pb(Mg_{1/3}Nb_{2/3}\}_{0.8}Ti_{0.2}O_3$”, *Phys. Rev. B* **65**, 144113 (2002).

29. V. Kiryukhin, T. Y. Koo, A. Borissov, Y. J. Kim, C. S. Nelson, J. P. Hill, D. Gibbs, S-W. Cheong, "Common features of nanoscale structural correlations in magnetoresistive manganites with a ferromagnetic low-temperature state", *Phys. Rev. B* **65**, 094421 (2002).

28. S. I. Kiselev, V. V. Khmelenko, D. M. Lee, V. Kiryukhin, R. E. Boltnev, E. B. Gordon, B. Keimer, "X-ray studies of structural changes of impurity-helium solids", *J. Low Temp. Phys.* **126**, 235 (2002).

27. T. Y. Koo, V. Kiryukhin, P. A. Sharma, J. P. Hill, S-W. Cheong, "Magnetic-field-induced collapse of charge-ordered nanoclusters and the colossal magnetoresistance effect in $Nd_{0.7}Sr_{0.3}MnO_3$", *Phys. Rev. B* **64**, 220405 (2001).

26. S. I. Kiselev, V. V. Khmelenko, D. M. Lee, V. Kiryukhin, R. E. Boltnev, E. B. Gordon, B. Keimer, "Structural studies of impurity-helium solids", *Phys. Rev. B* **65**, 024517 (2001).

25. C. S. Nelson, M. v. Zimmermann, Y. J. Kim, J. P. Hill, Doon Gibbs, V. Kiryukhin, T. Y. Koo, S.-W. Cheong, D. Casa, B. Keimer, Y. Tomioka, Y. Tokura, T. Gog, and C. T. Venkataraman, "Correlated polarons in dissimilar perovskite manganites", *Phys. Rev. B* **64**, 174405 (2001).

24. V. Podzorov, B. G. Kim, V. Kiryukhin, M. E. Gershenson, and S-W. Cheong, "Martensitic accommodation strain and the metal-insulator transition in manganites", *Phys. Rev. B* **64**, 140406 (2001).

23. V. Kiryukhin, B. G. Kim, T. Katsufuji, J. P. Hill, and S-W. Cheong, "Nanoscale anisotropic structural correlations in the paramagnetic and ferromagnetic phases of $Nd_{0.5}Sr_{0.5}MnO_3$", *Phys. Rev. B* **63**, 144406 (2001).

22. V. Kiryukhin, Y.-J. Kim, F. C. Chou, K. J. Thomas, R. W. Erwin, Q. Huang, M. A. Kastner, R. J. Birgeneau, "Magnetic properties of the S=1/2 quasi-one-dimensional magnet $CaCu_2O_3$", *Phys. Rev. B* **63**, 144418 (2001).

21. J. P. Hill, C. S. Nelson, M. von Zimmermann, Y. J. Kim, D. Gibbs, D. Casa, B. Keimer, Y. Murakami, C. Venkataraman, T. Gog, Y. Tomioka, Y. Tokura, V. Kiryukhin, T. Y. Koo, S-W. Cheong, "Orbital correlations in doped Manganites", *Applied Physics A*, **73**, 723 (2001).

20. C. S. Nelson, M. v. Zimmermann, J. P. Hill, D. Gibbs, V. Kiryukhin, T. Y. Koo, and S-W. Cheong, "X-ray scattering studies of correlated polarons in $La_{0.7}Ca_{0.3}MnO_3$." In: *Vibronic Interactions: Jahn-Teller Effect in Crystals and Molecules*, edited by M.D. Kaplan and G.O. Zimmerman (Kluwer Academic Publishers, Dordrecht, 2001).

19. C. S. Nelson, Y. J. Kim, J. P. Hill, D. Gibbs, V. Kiryukhin, T. Y. Koo, and S-W. Cheong, "Structural distortions in the paramagnetic insulating phase of $La_{0.7}Ca_{0.3}MnO_3$", *Mat. Res. Soc. Symp. Proc.* **678**, EE7.3 (2001).

18. V. Kiryukhin, B. G. Kim, V. Podzorov, S-W. Cheong, T. Y. Koo, J. P. Hill, I. Moon, Y. H. Jeong, "Multiphase segregation and metal-insulator transition in single crystal $La_{5/8-y}Pr_yCa_{3/8}MnO_3$", *Phys. Rev. B* **63**, 024420 (2000).

17. V. Kiryukhin, Y. J. Wang, S. C. LaMarra, R. J. Birgeneau, T. Masuda, I. Tsukada, K. Uchinokura, "Reentrant spin-Peierls transition in Mg-doped $CuGeO_3$", *Phys. Rev. B* **61**, 9527 (2000).

16. T. Masuda, I. Tsukada, K. Uchinokura, Y. J. Wang, V. Kiryukhin, R. J. Birgeneau, "First-order phase transition between dimerized-antiferromagnetic and uniform-antiferromagnetic phases in $Cu_{1-x}M_xGeO_3$", *Phys. Rev. B* **61**, 4103 (2000).

15. Masuda T, Ina K, Hadama K, Tsukada I, Uchinokura K, Nakao H, Nishi M, Fujii Y, Hirota K, Shirane G, Wang Y.J., Kiryukhin V, Birgeneau R.J.,"Temperature versus concentration phase diagram of Mg- and Si-doped $CuGeO_3$", *Physica B* **284**, 1637 (2000).

14. R. J. Birgeneau, V. Kiryukhin, Y. J. Wang, "Tricritical to mean-field crossover at the spin-Peierls transition in $CuGeO_3$", *Phys. Rev. B* **60**, 14816 (1999).

13. Y. J. Wang, V. Kiryukhin, R. J. Birgeneau, T. Masuda, I. Tsukada, K. Uchinokura, "Structural critical scattering study of Mg-doped $CuGeO_3$", *Phys. Rev. Lett.* **83**, 1676 (1999).

12. D. Casa, V. Kiryukhin, O. A. Saleh, B. Keimer, J. P. Hill, Y. Tomioka, Y. Tokura, "Persistent x-ray photoconductivity and percolation of metallic clusters in charge-ordered manganites", *Europhys. Lett.* **47**, 90 (1999).

11. V. Kiryukhin, Y. J. Wang, F. C. Chou, M. A. Kastner, R. J. Birgeneau, "An x-ray induced structural transition in $La_{0.875}Sr_{0.125}MnO_3$", *Phys. Rev. B* **59**, R6581 (1999).

10. B. Keimer, D. Casa, V. Kiryukhin, O. A. Saleh, J. P. Hill, Y. Tomioka, Y. Tokura, "X-ray effects in charge-ordered manganites: a magnetic mechanism of persistent photoconductivity", *Mat. Sci. Eng. B* **63**, 30 (1999).

9. V. Kiryukhin, D. Casa, B. Keimer, J. P. Hill, M. J. Higgins, S. Bhattacharya, "X-ray scattering study of the charge-density-wave structure in $NbSe_3$ in high magnetic fields", *Phys. Rev. B* **57**, 1332 (1998).

8. V. Kiryukhin, D. Casa, B. Keimer, J. P. Hill, A. Vigliante, Y. Tomioka, Y. Tokura, "X-ray induced insulator-metal transitions in CMR manganites", in *Science and Technology of Magnetic Oxides*, ed. M. Hundley, J. Nickel. R. Ramesh, Y. Tokura, MRS Symposia Proceedings No. **494** (Materials Research Society, Pittsburgh, 1998), p. 65.

7. V. Kiryukhin, B. Keimer, R. E. Boltnev, V. V. Khmelenko, E. B. Gordon, "Inert-gas solids with nanoscale porosity", *Phys. Rev. Lett.* **79**, 1774 (1997).

6. V. Kiryukhin, D. Casa, J.P. Hill, B. Keimer, A. Vigliante, Y. Tomioka and Y. Tokura, "An x-ray-induced insulator-metal transition in a magnetoresistive manganite", *Nature* (London) **386**, 813 (1997).

5. V. Kiryukhin, B. Keimer, J.P. Hill, S.M. Coad and D.M. Paul, "Synchrotron x-ray scattering study of magnetic field induced transitions in Cu_{1-x} $(Zn,Ni)_x$ GeO_3", *Phys. Rev. B* **54**}, 7269 (1996).

4. V. Kiryukhin, B. Keimer, J.P. Hill and A. Vigliante, "Soliton lattice in pure and diluted $CuGeO_3$", *Phys. Rev. Lett.* **76**, 4608 (1996).

3. V. D. Kiryukhin, I. I. Chuev, M. Yu. Antipin, and S. M. Aldoshin, "Precision x-ray diffraction study of the secondary interactions in the crystal of 1-dimethylcarbamoyl-8 dimethylaminonaphthalene", *Mol. Cryst. Liq. Cryst.* **275**, 241 (1996).

2. V. Kiryukhin and B. Keimer, "Incommensurate lattice modulation in the spin-Peierls system $CuGeO_3$", *Phys. Rev. B* **52**, R704 (1995).

1. V. Kiryukhin, B. Keimer and D.E. Moncton, “Direct observation of a magnetic field induced commensurate-incommensurate transition in a spin-Peierls system”, *Phys. Rev. Lett.* **74**, 1669 (1995).