CHENGLIN ZHANG

Rice University，6100 main street, MS-61，Houston TX 77005| C: (713)-348-5310| chenglinutk@gmail.
**Permanent resident*

Research Interests:

My primary interest is to explore and exploit exotic materials with novel electronic properties for renewable energy technologies. Multiferroics, high temperature superconductors (cuprates/iron pnictides), nano heterostructures with multiple functions are of particular interest. New materials from intermetallics to oxides are often synthesized by variant techniques such as sol-gel, high pressure, floating zone, flux and chemical transportation. Except the characterization of magnetic and electronic properties in house, I also conduct neutron scattering research at domestic and international neutron sources (ORNL/NIST, ILL, FRM-II, ISIS, PSI and J-Park) to investigate the dynamics of materials.

Summary

- Professional crystal grower with 12+ year experience of ceramic, metallic and oxide synthesis by sole-gel method, solid state reaction, flux method, chemical vapor transportation, floating zone and Bridgman furnace under extreme conditions such as high vacuum, high pressure and high temperature. Professional handling most of toxic, flammable, air sensitive and radioactive materials.
- Professional X-ray/Neutron scattering guy with 5+ year experience of studying the electronic, magnetic and structural properties by using nuclear reactors at national laboratories in USA and Europe.
- First achieved highly ordered magnetic nanocheckerboard in oxides through chemical phase separation. The size is pushed down to 10 nm while keeping strong magnetization at room temperature. It could be used for perpendicular recording media by improving storage density up to 10 Tbit/inch^2.
- First discovered giant magnetoelectric effect in (Eu,Y)MnO3 in which magnetic magnetization can be dramatically tuned by applying electric field. This material could be used for sensors.
- Built two advanced material laboratories from scratch at University of Tennessee and Rice University. Have abundant experience dealing with companies by purchasing custom design equipment over 2 million dollars. Solved the challenging single crystal growth of many high-temperature iron-based superconductors. Many of them are unique and only available from our lab in this continent.
- Demonstrated 10+ years experience in managing, training and supervising scholars, graduate and undergraduate students in research. Seven out eight undergraduates went to top 10 graduate schools.
- Published 70+ peer-reviewed journal papers with total citation 2000+ and H index 23 including 9 leading author papers in Nature Communications, Physics Review Letter and Scientific Report etc.
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Core qualifications:

- Crystal/powder growth by different techniques: Bridgman furnace, floating-zone, flux method, chemical transport, high-pressure synthesis, sol-gel method and solid state reaction.
- Physical Property characterizations by PPMS, MPMS, X-ray and neutron scattering.
- Data analysis by Matlab and Originlab

Education:

- Ph.D. in Physics Rutgers, the State University of New Jersey, 10/2008
  - *Thesis*: “Nano-self-assembly in Mn-based spinels through solid state process”
  - *Advisor*: Prof. Sang-Wook Cheong
- Master in Physics Institute of Solid State Physics, CAS, Hefei, China 07/2002

University of Science and Technology of China (USTC) 07/2000

- B.S. in Physics Hubei University, Wuhan ,China 07/1999

Professional experience:

Rice University **12/2013 – present**
Research scientist

- Setup a new advanced material laboratory for the growth of magnetic and superconducting materials.
- Solve the single crystal growth of LiFeAs (up to 2 centimeters), a high-temperature Iron-based superconductor, and drive a new direction of neutron scattering research.

University of Tennessee **10/2008-12/2013**
Research assistant Professor/Postdoctoral fellow

- Built an advanced material laboratory from scratch.
- Solved the challenging single crystal growth of many Iron-based superconductors such as KFe_2As_2/NaFeAs in which extremely volatile alkali metals and toxic arsenic are involved. So far, sizable crystals (up to 4 centimeters) are only available in our laboratory.
- Carried out numerical neutron scattering experiments in national neutron research centers (ORNL/NIST, ILL, FRM-II, ISIS, PSI and J-Park). Many new and important results were first-time reported such as double neutron resonances in Co-underdoped NaFeAs.
- Supervised scholar, graduate and undergraduate students in both material research and neutron scattering study.

Rutgers University **09/2002-10/2008**
Ph.D, Research Assistant

- Various techniques had been applied to grow magnetic materials in the form of single crystals such as Bridgman furnace, floating-zone, flux, chemical transportation and high pressure.
- A new nanostructure fabrication was introduced by chemical phase separation in solid state reaction. A highly-ordered 3D magnetic structure was discovered showing large shape magnetic anisotropy to overcome the thermal activation once the size reach down to 10 nm. The pattern could be grown into thin film and possibly applicable in magnetic perpendicular recording.
- Several new multiferric were found. In such special materials, the magnetization can be tuned by applying electric field or vise versa. Therefore, they are promising candidates for next generation magnetic media.

Selected publications:

1. Chenglin Zhang, Yu Song ,Yixi Su, Louis-Pierre Regnault, Weicheng Lv, Caleb Redding, , Zachary Sims, Guotai, Tan, Takeshi Egami and Pengcheng Dai, "Anisotropic neutron spin resonance in underdoped superconducting NaF1-xCo xAs" ***Phys. Rev. B*** 90, 140502(R) (2014)
2. Chenglin Zhang, Leland.W.Harriger, Zhiping Yin, Weicheng Lv, Miaoyin Wang, Guotai Tan, Yu Song, Tucker Netherton, Scott Carr, D.L.Abernathy, Songxue Chi, Andy Christianson, Wei Tian, Takeshi Egami, K Haule, G Kotliar and Pengcheng Dai, "Effect of Pnictogen Height on Spin Waves in Iron Pnictides" ***Phys. Rev. Lett.*** 112, 217202 (2014).
3. Chenglin Zhang, Rong Yu, Yixi Su,Yu Song, Miaoyin Wang, Guotai Tan,Takeshi Egami, J. A. Fernandez-Baca, Enrico Faulhaber, Qimiao Si, and Pengcheng Dai "Measurement of a Double Neutron-Spin Resonance and an Anisotropic Energy Gap for Underdoped Superconducting $NaFe_{0.985}Co_{0.015}As$ Using Inelastic Neutron Scattering" ***Phys. Rev. Lett.*** *111, 207002 (2013).*
   [Highlight in FRM-II annual report 2013, the neutron center in German.]
4. Meng Wang, Chenglin Zhang (equal contribution), Xingye Lu, Guotai Tan, Huiqian Luo, Yu Song, Miaoyin Wang, Xiaotian Zhang, E. A. Goremychkin, T. G. Perring, T. A. Maier, Zhiping

Yin, Kristjan Haule, Gabriel Kotliar, Pengcheng Dai, "A magnetic origin for high temperature superconductivity in iron pnictides**"** ***Nature communications*** 4, 2874, (**2013)**
[Highlight at ISIS research, the neutron center in UK.]

5. Chenglin Zhang, H.-F. Li, Yu Song, Yixi Su, Guotai Tan, Tucker Netherton, Caleb Redding, Scott V. Carr, Oleg Sobolev, Astrid Schneidewind, Enrico Faulhaber, L. W. Harriger, Shiliang Li, Xingye Lu, Daoxin Yao, Tanmoy Das, A. V. Balatsky, Th. Bruckel, J. W. Lynn, Pengcheng Dai, "Distinguishing s+- and s++ electron pairing symmetries by neutron spin resonance in superconducting $NaFe_{0.935}Co_{0.045}As$", ***Phys. Rev. B***.88.064504 (2013) (Editor's suggestion)
6. Chenglin Zhang, Mengshu Liu, Yixi Su, Louis-Pierre Regnault, Meng Wang, Guotai Tan, Th Bruckel, Takeshi Egami, Pengcheng Dai, "Magnetic anisotropy in hole-doped superconducting $Ba_{0.67}K_{0.33}Fe_2As_2$ probed by polarized inelastic neutron scattering", ***Phys. Rev. B*** 87, 081101(R) (2013) (Editor's suggestion)
7. Chenglin Zhang, Meng Wang, Huiqian Luo, Miaoyin Wang, Mengshu Liu, Jun Zhao, Douglas L Abernathy, Thomas A Maier, Karol Marty, MD Lumsden, Songxue Chi, Sung Chang, Jose A Rodriguez-Rivera, JW Lynn, Tao Xiang, Jiangping Hu, Pengcheng Dai, "Neutron Scattering Studies of spin excitations in hole-doped $Ba_{0.67}K_{0.33}Fe_2As_2$ superconductor", ***Scientific reports*** 1, 115, (2011) .
8. Shiliang Li, Chenglin Zhang, Meng Wang, Hui-qian Luo, Xingye Lu, Enrico Faulhaber, Astrid Schneidewind, Peter Link, Jiangping Hu, Tao Xiang, Pengcheng Dai, "Normal-State Hourglass Dispersion of the Spin Excitations in $FeSe_xTe_{1-x}$", ***Phys. Rev. Lett***. 105, 157002 (2010)
9. YJ Choi, CL Zhang, N Lee, SW Cheong, "Cross-Control of Magnetization and Polarization by Electric and Magnetic Fields with Competing Multiferroic and Weak-Ferromagnetic Phases", ***Phys. Rev. Lett***. 105, 097201 (2010)
   Highlights:
   - **http://www.sciencedaily.com/releases/2010/08/100823121945.htm**
   - **http://physics.aps.org/articles/v3/72**

10. CL Zhang, CM Tseng, CH Chen, S Yeo, YJ Choi and SW Cheong, "Magnetic nanocheckerboards with tunable sizes in the Mn-doped $CoFe_2O_4$ spinel ", ***Applied Physics Letters*** 91 (23), 233110-233110-3, (2007)
11. CL Zhang, S Yeo, Y Horibe, YJ Choi, S Guha, M Croft, SW Cheong and S Mori, "Coercivity and nanostructure in magnetic spinel Mg(Mn,Fe)2O4", ***Applied physics letters*** 90 (13), 133123-133123-3, (2007)
12. S Park, YJ Choi, CL Zhang and SW Cheong, "Ferroelectricity in an S= 1/2 chain cuprate", ***Physical review letters*** 98 (5), 57601,(2007) (Cited Times 233)
    [The first time, multiferroicity was reported in $LiCu_2O_2$.]

Complete publications:

(70+ publications in refereed journals, 2000+ citations, H-index 23)

1. Chenglin Zhang, Zhiping Yin, Guotai Tan, Yu Song, T. G. Perring, Takeshi Egami and Pengcheng Dai, "Co doping effect on magnetic fluctuation in NaFeAs" (in preparation, 2014)
2. Chenglin Zhang,Weicheng Lv (equal contribution), Tanmoy Das, L.W.Harriger, Zachary C.Sims, Caleb Redding, Guotai Tan, Yu Song, Scott Carr, Songxue Chi, Masaaki Mastuda, Andrew Christianson, J.A. Fernandez-Baca, Takeshi Egami and Pengcheng Dai"Unusual decoupling neutron resonances from superconducting transition temperatures and doping level in $NaFe_{1-x}Co_xAs$", (submitted, 2014)
3. Chenglin Zhang, Yu Song ,Yixi Su, Louis-Pierre Regnault, Weicheng Lv, Caleb Redding, , Zachary Sims, Guotai, Tan, Takeshi Egami and Pengcheng Dai, "Anisotropic neutron spin resonance in underdoped superconducting NaFe1-xCo xAs" ***Phys. Rev. B*** 90, 140502(R) (2014).
4. V. K. Thorsmolle, M. Khodas, Z. P. Yin, Chenglin Zhang, S. V. Carr, Pengcheng Dai, G. Blumberg, "Critical Charge Fluctuations in Iron Pnictide Superconductors" (arXiv:1410.6456, 2014)

5. Yu Song, Zahra Yamani, Chongde Chao, Yu Li, Chenglin Zhang, Justin Chen, Qingzhen Huang, Hui Wu, Wei Tian, Songxue Chi, Rong Yu, Andriy H. Nevidomskyy, Emilia Morosan, Qimiao Si, and Pengcheng Dai "An antiferromagnetic Mott insulator near iron pnictide superconductors" (submitted, 2014)
6. Diyar Talbayev, Jinho Lee, Stuart A. Trugman, Chenglin Zhang, Sang-Wook Cheong, Richard D. Averitt, Antoinette J. Taylor, Rohit P. Prasankumar, "Spin-dependent polaron formation dynamics in $Eu_{0.75}Y_{0.25}MnO_3$ probed by femtosecond pump-probe spectroscopy", arXiv:1407.0073
7. P. Zhang, P. Richard, T. Qian, X. Shi, J. Ma, L.-K. Zeng, E. Rienks, C.-L. Zhang, Pengcheng Dai, Y.-Z. You, Z.-Y. Wen, X.-X. Wu, J. P. Hu, and H. Ding "Observation of momentum-confined in-gap impurity state in $Ba_{0.6}K_{0.4}Fe_2As_2$: evidence for anti-phase s+_pairing" ***Phys. Rev. X*** 4, 031001 (2014)
8. H. Kim, M. A. Tanatar, Yong Liu, Zachary Cole Sims, Chenglin Zhang, Pengcheng Dai, T. A. Lograsso, R. Prozorov, "Evolution of London penetration depth with scattering in single crystals of $K_{1-x}Na_xFe_2As_2$",***Phys. Rev. B*** 89, 174519 (2014)
9. Long Ma, J. Dai, X. R. Lu,Yu Song, Chenglin Zhang, S. L. Li, Pengcheng Dai, B. Normand, and Weiqiang Yu 'Phase Separation, Competition, and Volume Fraction Control in NaFe1−xCoxAs', (***PRB***, 2014)
10. Xingye Lu, David W. Tam, Chenglin Zhang, Huiqian Luo, Meng Wang, Rui Zhang, Leland W.Harriger, T. Keller,B. Keimer, L.-P. Regnault, Thomas A. Maier, and Pengcheng Dai, "Short-range cluster spin glass near optimal superconductivity in $BaFe_{2-x}Ni_xAs_2$", ***Phys. Rev. B*** 90, 024509 2014
11. Chenglin Zhang, Leland.W.Harriger, Zhiping Yin, Weicheng Lv, Miaoyin Wang, Guotai Tan, Yu Song, Tucker Netherton, Scott Carr, D.L.Abernathy, Songxue Chi, Andy Christianson, Wei Tian, Takeshi Egami, K Haule, G Kotliar and Pengcheng Dai, "Effect of Pnictogen Height on Spin Waves in Iron Pnictides***" Phys. Rev. Lett.*** 112, 217202 (2014).
12. H. Kim, M. A. Tanatar, Yong Liu, Z. C. Sims, Chenglin Zhang, Pengcheng Dai, T. A. Lograsso, and R. Prozorov Evolution of London penetration depth with scattering in single crystals of $K_{1-x}Na_xFe2As2$ ***Phys. Rev. B*** *89, 174519 (2014).*
13. W. Tian, Guotai Tan, Liu Liu, Jinxing Zhang, Barry Winn, Tao Hong, J. A. Fernandez-Baca, Chenglin Zhang, Pengcheng Dai, "Doping influence of spin dynamics and magnetoelectric effect in hexagonal $Y_{0.7}Lu_{0.3}MnO_3$" ***Physical Review B*** .89, 14, 2014
14. J.Munevar, H.Micklitz, J.Aguero, Guotai Tan, Chenglin Zhang, Pengcheng Dai, and E. Baggio-saitovitch "Superconductivity and antiferromagnetism in Ba0.75K0.25Fe2As2 single crystals as seen by ^{57}Fe Mossbauer spectroscopy" ***Phys. Rev. B*** *88, 184514 (2013)*
15. Huiqian Luo, Meng Wang, Chenglin Zhang, Xingye Lu, Louis-Pierre Regnault, Rui Zhang, Shiliang Li, Jiangping Hu, and Pengcheng Dai Spin Excitation Anisotropy as a Probe of Orbital Ordering in the Paramagnetic Tetragonal Phase of Superconducting BaFe1.904Ni0.096As2, ***Phys. Rev. Lett****. 111, 107006 (2013).*
16. Chenglin Zhang, Rong Yu, Yixi Su,Yu Song, Miaoyin Wang, Guotai Tan,Takeshi Egami, J. A. Fernandez-Baca, Enrico Faulhaber, Qimiao Si, and Pengcheng Dai "Measurement of a Double Neutron-Spin Resonance and an Anisotropic Energy Gap for Underdoped Superconducting $NaFe_{0.985}Co_{0.015}As$ Using Inelastic Neutron Scattering" ***Phys. Rev. Lett.*** *111, 207002 (2013).*
17. Meng Wang, Chenglin Zhang (equal contribution), Xingye Lu, Guotai Tan, Huiqian Luo, Yu Song, Miaoyin Wang, Xiaotian Zhang, E. A. Goremychkin, T. G. Perring, T. A. Maier, Zhiping Yin, Kristjan Haule, Gabriel Kotliar, Pengcheng Dai, "A magnetic origin for high temperature superconductivity in iron pnictides***" Nature communications*** 4, 2874, (**2013)**
18. Haifeng Li, Chenglin Zhang, Guotai Tan,Karin Schmalz,Martin Boehm,Wolfgang Schmidt, Jorg Persson, Paul Meuels, Pengcheng Dai, Thomas Brucke, Georg Roth and Louis-Pierre Regnault,"Triplet superconductivity in $NaFe_{0.935}Co_{0.045}As$ single crystal" (submitted, **2013**)
19. Yu Song, Louis-Pierre Regnault, Chenglin Zhang and Pengcheng Dai "In-plane spin excitation anisotropy in the paramagnetic state of NaFeAs" ***Phys. Rev. B*** *88, 134512 (2013)*

20. Q. Q. Ge, Z. R. Ye, M. Xu, Y. Zhang, J. Jiang, B. P. Xie, Y. Song, C. L. Zhang, Pengcheng Dai, and D. L. Feng, Anisotropic but Nodeless Superconducting Gap in the Presence of Spin-Density Wave in Iron-Pnictide Superconductor NaFe1-xCoxAs, ***Phys. Rev. X*** *3, 011020 (2013)*
21. L M Wang, Chih-Yi Wang, Un-Cheong Sou, H C Yang, L J Chang, aleb Redding, Yu Song, Pengcheng Dai,and Chenglin Zhang, "Longitudinal and transverse Hall resistivities in NaFe1-xCoxAs single crystals with x=0.022 and 0.0205: weak pinning and anomalous electrical transport properties" ***Journal of Physics: Condensed Matter*** *25, 395702 (2013)*
22. D H Kim, J Hwang, E Lee, JS Kang, CL Zhang, SW Cheong, BG Park, JY Kim "Soft X-ray synchrotron radiation spectroscopy study of the Co0. 6Fe0. 9Mn1. 5O4 spinel with nano-checkerboard patterns ***Journal of the Korean Physical Society*** 62 (12), 1990-1993
23. J. Lee, S. A. Trugman, C. D. Batista, C. L. Zhang, D. Talbayev, X. S. Xu, S. --W. Cheong, D. A. Yarotski, A. J. Taylor, R. P. Prasankumar, "Probing the Interplay between Quantum Charge Fluctuations and Magnetic Ordering in $LuFe_2O_4$", ***Scientific reports*** **3,** 2654, (2013)
24. G. F. Ji, J. S. Zhang, Long Ma, P. Fan, P. S. Wang, J. Dai, G. T. Tan, Y. Song, C. L. Zhang, Pengcheng Dai, B. Normand, and Weiqiang Yu, "Simultaneous Optimization of Spin Fluctuations and Superconductivity under Pressure in an Iron-Based Superconductor" ***Phys. Rev. Lett.*** *111, 107004 (2013).*
25. Zhenyu Wang, Huan Yang, Delong Fang, Bing Shen, Qiang-Hua Wang, Lei Shan, Chenglin Zhang, Pengcheng Dai, Hai-Hu Wen, "Close relationship between superconductivity and the bosonic mode in Ba0.6K0.4Fe2As2 and Na(Fe0.975Co0.025)As", ***Nature Physics*** 9, 42-48 (2013)
26. Huiqian Luo, Meng Wang, Chenglin Zhang, Louis-Pierre Regnault, Rui Zhang, Shiliang Li, Jiangping Hu, Pengcheng Dai, "Spin excitation anisotropy as a probe of orbital ordering in the paramagnetic tetragonal phase of superconducting $BaFe_{1.904}Ni_{0.096}As_2$" ***Phys. Rev. Lett.*** 111, 107006 (2013)
27. Sangwon Oh, A. M. Mounce, J. S. Lee, W. P. Halperin, C. L. Zhang, S. Carr, Pengcheng Dai, "Spin-pairing and penetration depth measurements from nuclear magnetic resonance in $NaFe_{0.975}Co_{0.025}As$" ***Phys. Rev. B*** 87 174517 (2013)
28. Chenglin Zhang, H.-F. Li, Yu Song, Yixi Su, Guotai Tan, Tucker Netherton, Caleb Redding, Scott V. Carr, Oleg Sobolev, Astrid Schneidewind, Enrico Faulhaber, L. W. Harriger, Shiliang Li, Xingye Lu, Daoxin Yao, Tanmoy Das, A. V. Balatsky, Th. Bruckel, J. W. Lynn, Pengcheng Dai, "Distinguishing s+- and s++ electron pairing symmetries by neutron spin resonance in superconducting $NaFe_{0.935}Co_{0.045}As$", ***Phys. Rev. B***.88.064504 (2013) (Editor's suggestion)
29. Yu Song, Scott V Carr, Xingye Lu, Chenglin Zhang, Zachary C Sims, NF Luttrell, Songxue Chi, Yang Zhao, Jeffrey W Lynn, Pengcheng Dai, "Uniaxial pressure effect on structural and magnetic phase transitions in NaFeAs and its comparison with as-grown and annealed $BaFe_2As_2$", ***Phys. Rev. B*** 87, 184511 (2013)
30. Guotai Tan, Ping Zheng, Xiancheng Wang, Yanchao Chen, Xiaotian Zhang, Jianlin Luo, Tucker Netherton, Yu Song, Pengcheng Dai, Chenglin Zhang, Shiliang Li, "Strong-coupling superconductivity in $NaFe_{1-x}Co_xAs$: Validity of Eliashberg theory", ***Phys. Rev. B*** 87, 144512 (2013)
31. Chenglin Zhang, Mengshu Liu, Yixi Su, Louis-Pierre Regnault, Meng Wang, Guotai Tan, Th Bruckel, Takeshi Egami, Pengcheng Dai, "Magnetic anisotropy in hole-doped superconducting $Ba_{0.67}K_{0.33}Fe_2As_2$ probed by polarized inelastic neutron scattering", ***Phys. Rev. B*** 87, 081101(R) (2013) (Editor's suggestion)
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33. N Spyrison, M.A Tanatar, Kyuil Cho, Y Song, Pengcheng Dai, Chenglin Zhang, R Prozorov, "Environmental stability and anisotropic resistivity of Co-doped $N_{a1-\delta}F_{e1-x}C_{ox}As$", ***Phys. Rev. B*** 86, 144528 (2012)
34. NS Bingham, P Lampen, MH Phan, TD Hoang, HD Chinh, CL Zhang, SW Cheong, H Srikanth, "Impact of nanostructuring on the magnetic and magnetocaloric properties of microscale phase-separated $La_{5/8-y}Pr_yCa_{3/8}MnO_3$ manganites", ***Phys. Rev. B*** 86, 064420 (2012)

35. Leland W Harriger, OJ Lipscombe, Chenglin Zhang, Huiqian Luo, Meng Wang, Karol Marty, MD Lumsden, Pengcheng Dai, "Temperature dependence of the resonance and low-energy spin excitations in superconducting $FeTe_{0.6}Se_{0.4}$", ***Phys. Rev. B*** 85, 054511 (2012)
36. MA Tanatar, N Spyrison, K Cho, EC Blomberg, G Tan, P Dai, C Zhang, R Prozorov, "Evolution of normal and superconducting properties of single crystals of $Na_{1-\delta}FeAs$ upon interaction with environment", ***Phys. Rev. B*** 85, 014510 (2012)
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38. Miaoyin Wang, Chen Fang, Dao-Xin Yao, GuoTai Tan, Leland W Harriger, Yu Song, Tucker Netherton, Chenglin Zhang, Meng Wang, Matthew B Stone, Wei Tian, Jiangping Hu, Pengcheng Dai, "Spin waves and magnetic exchange interactions in insulating $Rb_{0.89}Fe_{1.58}Se_2$", **Nature Communications** 2, 580 (2011)
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44. Hoyoung Jang, J-S Lee, K-T Ko, W-S Noh, TY Koo, J-Y Kim, K-B Lee, J-H Park, CL Zhang, Sung Baek Kim, S-W Cheong, "Coupled Magnetic Cycloids in Multiferroic $TbMnO_3$ and $Eu_{3/4}Y_{1/4}MnO_3$", **Phys. Rev. Lett**. 106, 047203 (2011)
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low-energy spin excitations in the iron arsenide superconductor $BaFe_{2-x}Ni_xAs_2$", **Phys. Rev. B** 81, 174524 (2010)

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Talks:

1. 2011 Aug， Single crystal growth and neutron scattering study of $Ba_{1-x}K_xFe_2As_2$, THE 18TH AMERICAN CONFERENCE ON CRYSTAL GROWTH AND EPITAXY, MONTEREY, CALIFORNIA, **USA** (**Invited**)
2. 2011 Nov， Neutron scattering study on $Ba_{1-x}K_xFe_2As_2$, User conference, Oak ridge national lab, Knoxville, Tennessee, **USA**
3. 2012 Aug， Neutron scattering study on overdoped NaFeAs, User conference, FRM-II, Munich, **German**.
4. 2014 Jun, "Neutron scattering study on $NaFe_{1-x}Co_xAs$" American Conference on Neutron Scattering, Knoxville, Tennessee **USA** (**Invited**)
5. 2014 Aug, Towards novel materials by traditional ways, Ames lab, IOWA, **USA** (**Invited**)
6. 2014 Oct, Novel material design and study by neutron scattering, University of Alabama, USA (**Invited**)
7. 2014 Oct, Magnetic material design and Neutron scattering study of Fe-based superconductors, ShanghaiTech, Shanghai, **CHINA** (**Invited**)
8. 2014 Nov, "Neutron scattering study on $NaFe_{1-x}Co_xAs$" The 2nd national conference on neutron scattering, Sichuan, **CHINA** (**Invited**)
9. 2006-2014 March， APS meeting Oral presentation

Workshops:

- "New States of Stable and Unstable Quantum Matter", Trieste, **Italy** (Aug 14-25, 2006)
- "International Workshop on the Search for New Superconductors –Frontier and Future Shonan Village Center, Kanagawa, **Japan** (May 12-16, 2009)

Memberships:

- American Physical Socienty (APS)
- American Association for Crystal growth (AACG)
- Neutron Scattering Society of America (NSSA)

Service:

2014 Dec, sorter meeting for APS 2015 at Headquarter, College park

Refrenece #1:

Prof. Pengcheng Dai (Postdoc advisor)
Department of Physics and Astronomy, Rice University,
6100 Main MS-61, Houston, Texas 77005-1827
PHONE: (713)-348-3731
EMAIL: pdai.utk@gmail.com

Refrenece #2:

Prof. Ruslan Prozorov (collaborator)
Scientist, Ames Laboratory and Associate Professor, Iowa State University
A119 Zaffarano Hall
Iowa State University
Ames, IA 50011
PHONE 515-294-9901
FAX 515-294-7249
EMAIL prozorov@ameslab.gov

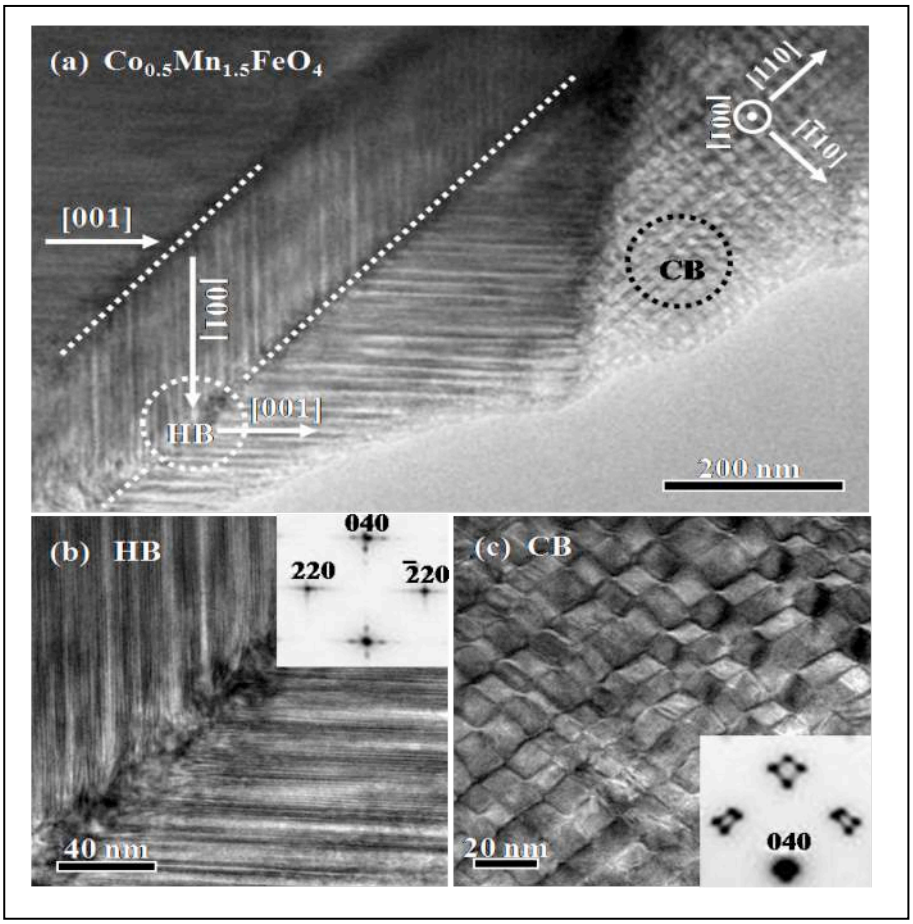
Refrenece #3:

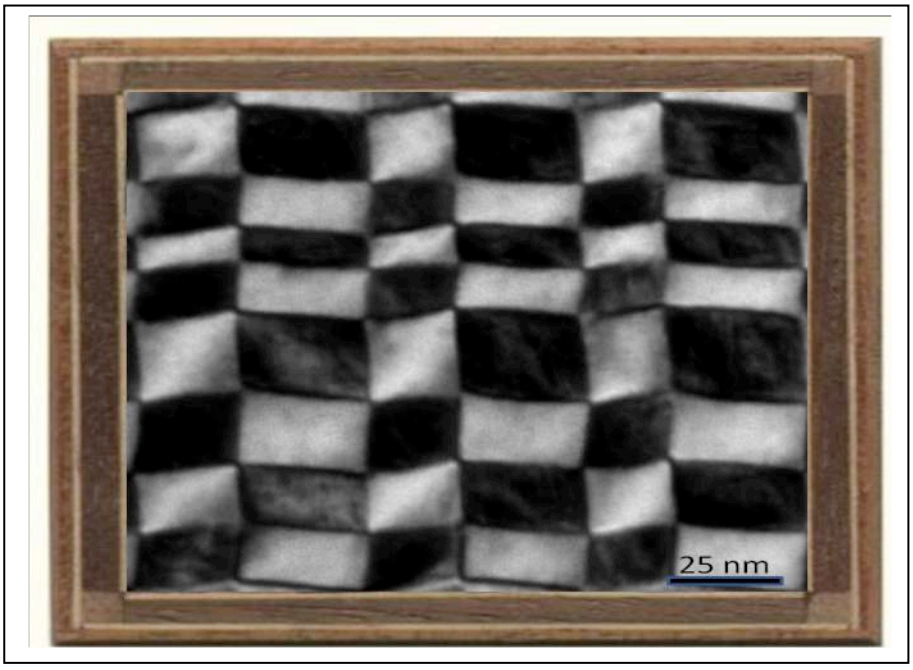
Dr. Yixi Su (collaborator)
Juelich Centre for Neutron Science (JCNS)
Forschungszentrum Juelich GmbH
Outstation at FRM II
Lichtenbergstr. 1
D-85747 Garching
Germany
PHONE +49 89 289 10714
FAX +49 89 289 10799
EMAIL: y.su@fz-juelich.de

Refrenece #4:

Prof. Nanlin Wang (collaborator)
International Center for Quantum Materials, School of Physics,
Peking University, Beijing 100871, China
EMAIL: nlwang@pku.edu.cn

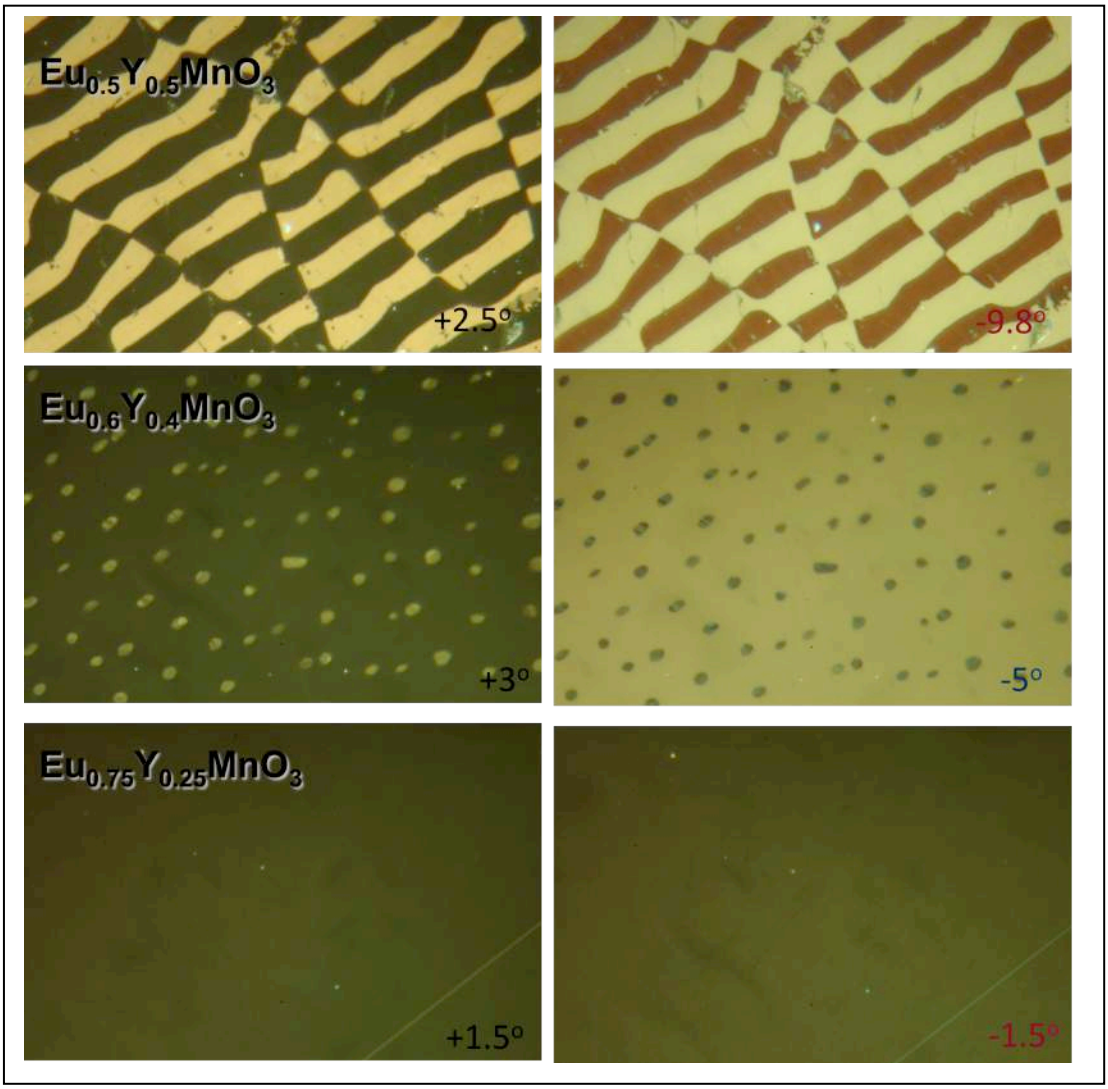
Highly ordered nano-structure in $Co(Fe,Mn)_2O_4$ *(2005-2007 at Rutgers)*





The first multiferroic cuprate $LiCu_2O_2$ *(2006 at Rutgers)*

Colossal Magnetoelectricity in multiferroic $(Eu,Y)MnO_3$ *(2006-2007 at Rutgers)*

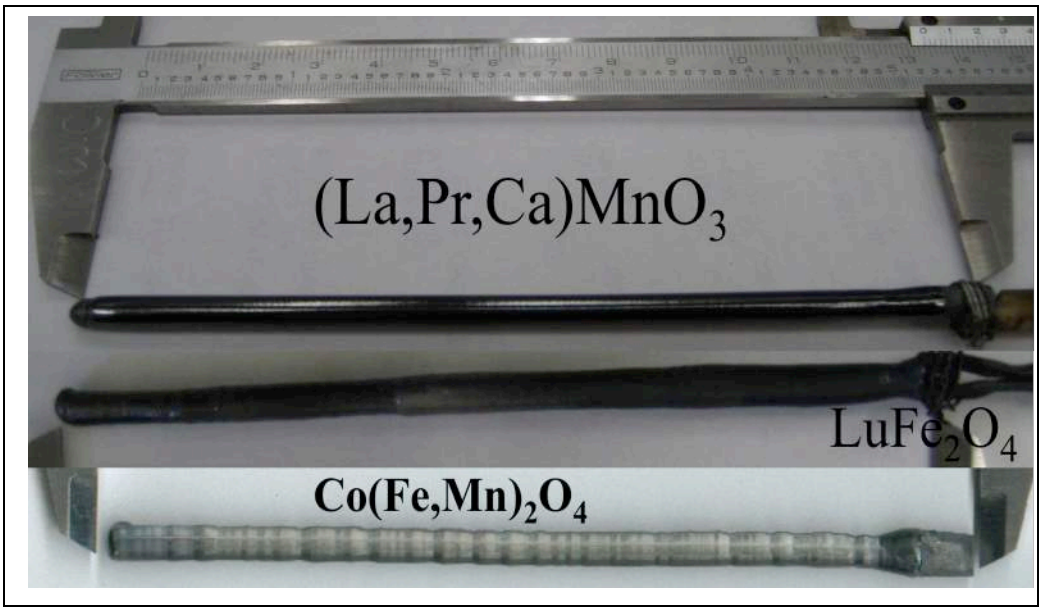


See highlights:

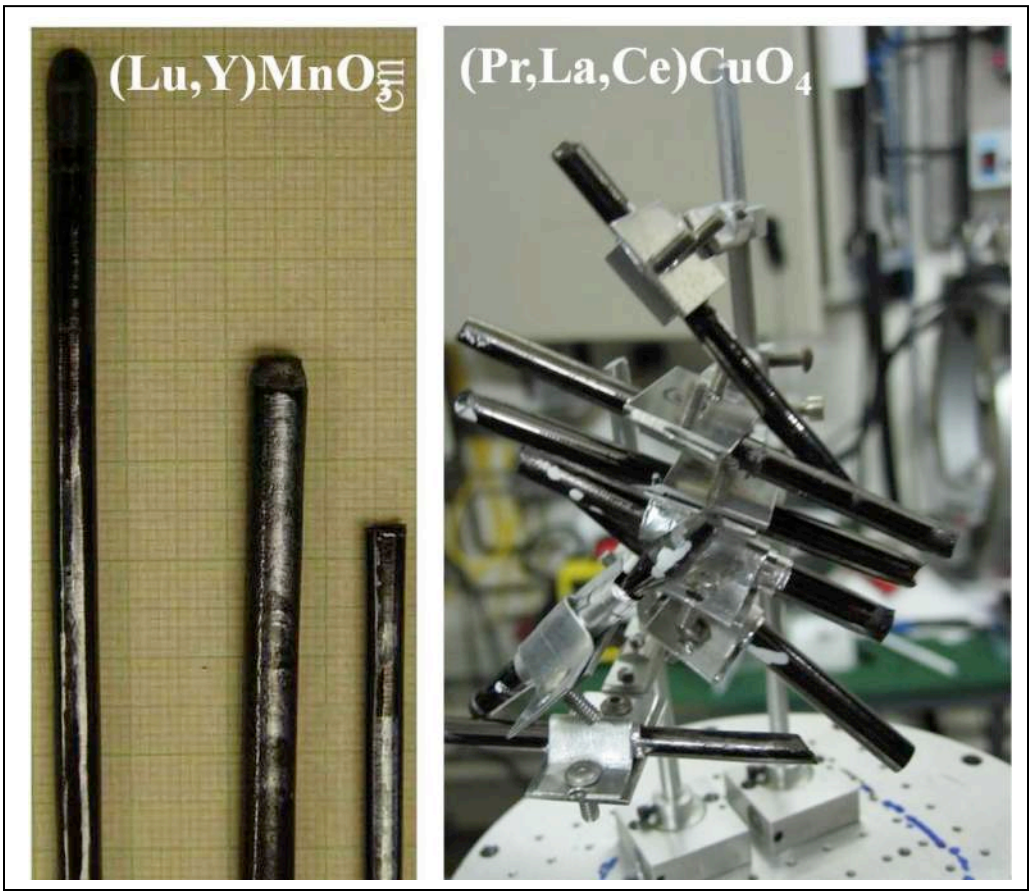
1, http://www.sciencedaily.com/releases/2010/08/100823121945.htm

2, http://physics.aps.org/articles/v3/72

CMR/Multiferroic xtals *(2004-2008 at Rutgers)*



Multiferroic and cuprate superconductor *(2008-2010 at UT)*



Fe-based superconductors *(Up to 2.5 cm and 3 g/piece, 209-2011 at UT)*

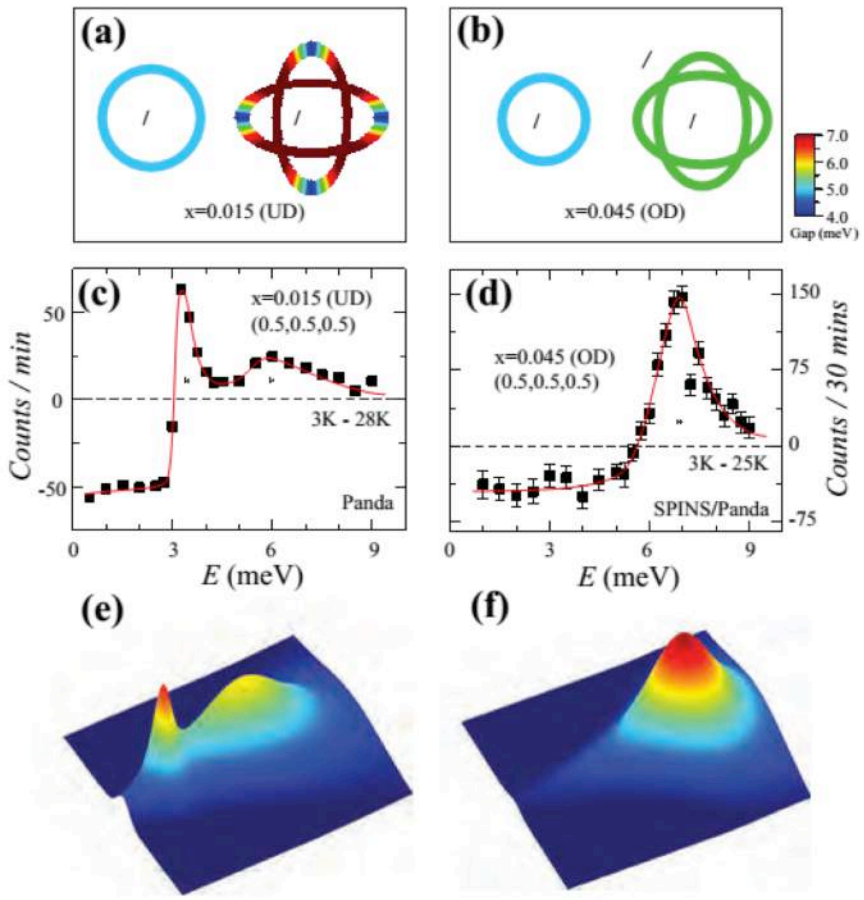


Figure 2: (a-b) Schematics of Fermi surfaces and superconducting gaps in underdoped and overdoped samples near the Γ and M points. (c-d) Double resonances and single resonance are obtained by taking temperature difference below and above T_c in underdoped $NaFe_{0.985}Co_{0.015}As$ (T_C = 5 K) and overdoped $NaFe_{0.935}Co_{0.045}As$ (T_C = 18 K) at the wave vector (0.5,0.5,0.5). (e-f) Schematic view of double resonances and single resonance in the [H,H] and E plane.

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