
# YANG LIU

Professor of School of Materials Science and Engineering
State Key Laboratory of Materials Processing and Die & Mould Technology
Huazhong University of Science and Technology, Wuhan, Hubei, China
Tel: +8613343491919
E-mail: yliu1319@hust.edu.cn; liuyangphy52@gmail.com
Website: https://sites.google.com/view/liuyangphy52/


## EDUCATION AND TRAINING

- 2021.08-now Professor of Materials Science and Engineering,
  State Key Laboratory of Materials Processing and Die & Mould Technology
  Huazhong University of Science and Technology, Wuhan, Hubei, China
- 2016-2021 Postdoctoral Research, Materials Science and Engineering,
  The Pennsylvania State University, University Park, PA, USA
  Advisor: Prof. Qing Wang
- 2013-2016 PhD in Condensed Matter Physics, CentraleSupélec,
  Paris-Saclay University, Gif-sur-Yvette, France
  Advisor: Prof. Brahim Dkhil
- 2009-2012 MS in Condensed Matter Physics, Lanzhou University, Lanzhou, Gansu, China
  Advisor: Assoc. Prof. Xingping Peng

## RESEARCH INTEREST

- Design of ferroelectrics for energy storage and conversion applications
- Interface engineering of dielectric polymer nanocomposites for capacitive energy storage
- Caloric effect in solid-state ferroic materials

## AWARDS

- China scholarship council award (2012)
- Publication prize of Supelec Fondation of CentraleSupelec (2016)
- APS FECS March Meeting Mini Grant (2021)
- MRS Postdoctoral Award (2021)
- Postdoctoral Excellence in Research Award, Penn State University (2021)

## PUBLICATIONS

**72** total journal publications, including **1** *Nature*, **1** *Nature Materials*, **2** *Nature Communications*, **7** *Advanced Materials*, **1** *Advanced Energy Materials*, **3** *Advanced Functional Materials*, **1** *Advanced Science*, **1** *ACS Energy Letters*, **1** *Applied Physics Reviews*, **1** *Chemical Society Reviews*， **1** *Annual Review of Materials Research*, **2** *Macromolecules*, **13** *Applied Physics Letters*, **5** *Physical Review B*.

Citations (Google Scholars): **2485**, H-index=**25** (* Corresponding author † Equally contributing authors)

1. **Yang Liu**, Bing Zhang, Wenhan Xu, Haibibu Aziguli, Zhubing Han, Wenchang Lu, J. Bernholc, and Qing Wang*, "*Chirality-induced relaxor properties in ferroelectric polymers*." ***Nature Materials*** *2020, 2020,* 19, 1169-1174 (*Highlighted in Phys.org, Science daily, ScienMag, Bioengineer*)
2. **Yang Liu**, Haibibu Aziguli, Bing Zhang, Wenhan Xu, Wenchang Lu, J. Bernholc, and Qing Wang*,

## PUBLICATIONS

"*Ferroelectric polymers exhibiting behaviour reminiscent of a morphotropic phase boundary*." ***Nature*** *2018*, 562, 96-100. (Highlighted in *Nature News & Views*; *Science Daily, Materials Today, Technology.org, R&D, Nanowerk, EurekAlert!*)

3. **Yang Liu**, Tiannan Yang, Bing Zhang, Teague Williams, Yen-Ting Lin, Li Li, Yao Zhou, Wenchang Lu, Seong H. Kim, Long-Qing Chen, J. Bernholc, and Qing Wang *, " *Structural insight in the interfacial effect in ferroelectric polymer nanocomposites*." ***Advanced Materials*** *2020*, 32, 2005431.
4. **Yang Liu**, Haibibu Aziguli, Wenhan Xu, Zhubing Han, and Qing Wang*, "*Observation of a negative thermal hysteresis in relaxor ferroelectric polymers*." ***Advanced Functional Materials*** *2020*, 30, 2000648.
5. **Yang Liu** and Qing Wang*, "*Ferroelectric polymers exhibiting negative longitudinal piezoelectric coefficient: Progress and prospects*." ***Advanced Science*** *2020*, 7, 1902468. (*Invited Progress Report*)
6. Yang Liu, Yen-Ting Lin, Aziguli Haibibu, Wenhan Xu, Yao Zhou, Li Li, Seong H Kim, Qing Wang*, ***Small Science*** *2021*, 1, 2000061.( *Invited ariticle*)
7. **Yang Liu**, Zhubing Han, Wenhan Xu, Haibibu Aziguli, and Qing Wang*, "*Composition-dependent dielectric properties of poly (vinylidene fluoride-trifluoroethylene)s near the morphotropic phase boundary*." ***Macromolecules*** *2019*, 52, 6741-6747.
8. **Yang Liu**, Bing Zhang, Aziguli Haibibu, Wenhan Xu, Zhubing Han, Wenchang Lu, J. Bernholc, and Qing Wang*, "*Insights into the morphotropic phase boundary in ferroelectric polymers from the molecular perspective*." ***Journal of Physical Chemistry C*** *2019*, 123, 8727-8730.
9. **Yang Liu**, Guangzu Zhang, Aziguli Haibibu, Zhubing Han, and Qing Wang*, "*High cyclic stability of electrocaloric effect in relaxor poly(vinylidene fluoride-trifluoroethylene-chlorofluoroethylene) terpolymers in the absence of ferroelectric phase transition*." ***Journal of Applied Physics*** *2019*, 126, 234102.
10. Haibibu Aziguli, **Yang Liu***, Guangzu Zhang, Shenglin Jiang, Ping Yu, and Qing Wang, "*Tuning the electrocaloric reversibility in ferroelectric copolymers by a blend approach*." ***EPL (Europhysics Letters)*** *2019*, 125, 57001.
11. **Yang Liu***, Guangzu Zhang, Qi Li, Laurent Bellaiche, James F. Scott, Brahim Dkhil, and Qing Wang. "*Towards multicaloric effect with ferroelectrics*." ***Physical Review B*** *2016*, 94, 214113/1-7.
12. Mehmet Sanlialp†, Zhengdong Luo†, Vladimir V. Shvartsman, Xianzhu Wei†, **Yang Liu***, Brahim Dkhil, and Doru C. Lupascu, "*Direct measurement of electrocaloric effect in lead-free* $BaTi_{1-x}Sn_xO_3$ *ceramics*." ***Applied Physics Letters*** *2017*, 111, 173903/1-4.
13. **Yang Liu**†*, Lee C. Phillips†*, Richard Mattana, Manuel Bibes, Agnès Barthélémy, and Brahim Dkhil, "*Large reversible caloric effect in FeRh thin films via a dual-stimulus multicaloric cycle*." ***Nature Communications*** *2016*, 7, 11614. (*Highlighted by Inside Science*)
14. **Yang Liu***, Brahim Dkhil, and Emmanuel Defay*, "*Spatially-resolved imaging of electrocaloric effect and the resultant heat flux in multilayer capacitors*." ***ACS Energy Letters*** *2016*, 1, 521-528.
15. **Yang Liu***, James F. Scott, and Brahim Dkhil, "*Direct and indirect measurements on electrocaloric effect: recent developments and perspectives*." ***Applied Physics Reviews*** *2016*, 3, 031102/1-19. (*Invited review*)
16. Wenping Geng†, **Yang Liu**†*, Xiangjian Meng, James F. Scott, Brahim Dkhil, and Anquan Jiang, "*Giant*

## PUBLICATIONS

*inverse electrocaloirc effect in antiferroelectric La-doped Pb(ZrTi)$O_3$ thin films near room temperature*." ***Advanced Materials*** *2015*, 27, 3165-3169. (*selected as Frontispiece*)

17. **Yang Liu**, Ingrid C. Infante, Xiaojie Lou*, Laurent Bellaiche, James F. Scott, and Brahim Dkhil*, "*Giant elastocaloric effect in pervoskite ultrathin films at room temperature*." ***Advanced Materials*** *2014*, 26, 6132-6137.
18. **Yang Liu***, Hervé Strozyk, Brahim Dkhil, and Emmanuel Defay*, "*Insight into electrocaloric cooling power in multilayer capacitors using infra-red camera*." ***Applied Physics Letters*** *2016*, 109, 212902/1-5.
19. **Yang Liu***, James F. Scott, and Brahim Dkhil*, "*Some strategies for improving caloric responses with ferroelectrics*." ***APL Materials*** *2016*, 4, 064109/1-9. (*Invited review*)
20. Xiangjian Wang, Fang Tian, Chunlin Zhao, Jiagang Wu, **Yang Liu***, Brahim Dkhil, Ming Zhang, Zhipeng Gao, and Xiaojie Lou*, "*Giant electrocaloric effect in $Ba_{0.94}Ca_{0.06}Ti_{1-x}Sn_xO_3$ ceramics with tunable Curie temperature*." ***Applied Physics Letters*** *2015*, 107, 252905/1-5.
21. Bolu Liu, Bobo Tian, Jinglan Sun*, **Yang Liu***, Jianlu Wang, Shuo Sun, Xiangjian Meng, and Junhao Chu, "*Confinement effect on coercive field in relaxor ferroelectric terpolymer nanowires*." ***Applied Surface Science*** *2015*, 355, 473-476.
22. **Yang Liu***, Jie Wei, Xiaojie Lou, Laurent Bellaiche, James F. Scott, and Brahim Dkhil, "*Influence of epitaxial strain on elastocaloric effect in ferroelectric thin films*." ***Applied Physics Letters*** *2015*, 106, 032901/1-5.
23. **Yang Liu**, Jie Wei, Pierre-Eymeric Janolin, Ingrid C. Infante, Jens Kreisel, Xiaojie Lou, and Brahim Dkhil*, "*Prediction of giant elastocaloric strength and stress-mediated electrocaloric effect in $BaTiO_3$ single crystal*." ***Physical Review B*** *2014*, 90, 104107/1-6.
24. Zhengdong Luo, Dawei Zhang, **Yang Liu***, Di Zhou, Yonggang Yao, Chenqi Liu, Brahim Dkhil, Xiaobing Ren, and Xiaojie Lou*, "*Enhanced electrocaloric effect in lead-free $BaTi_{1-x}Sn_xO_3$ ceramics near room temperature*." ***Applied Physics Letters*** *2014*, 105, 102904/1-5.
25. **Yang Liu**, Jie Wei, Pierre-Eymeric Janolin, Ingrid C. Infante, Xiaojie Lou*, and Brahim Dkhil*, "*Giant room-temperature barocaloric effect and pressure-mediated electrocaloric effect in $BaTiO_3$ single crystal*." ***Applied Physics Letters*** *2014*, 104, 162904/1-5.
26. **Yang Liu***, Ingrid C. Infante, Xiaojie Lou, and Brahim Dkhil*, "*Giant electrocaloric effect in asymmetric ferroelectric tunnel junctions*." ***Applied Physics Letters*** *2014*, 104, 082901/1-5.
27. **Yang Liu***, Ingrid C. Infante, Xiaojie Lou, Doru C. Lupascu, and Brahim Dkhil, "*Giant mechanically-mediated electrocaloric effect in ultrathin ferroelectric capacitors at room temperature*." ***Applied Physics Letters*** *2014*, 104, 012907/1-5.
28. **Yang Liu***, Xiaojie Lou, Manuel Bibes, and Brahim Dkhil, "*Effect of a built-in electric field in asymmetric ferroelectric tunnel junctions*." ***Physical Review B*** *2013*, 88, 024106/1-8.
29. **Yang Liu***, Xingping Peng, Xiaojie Lou*, and Hu Zhou, "*Intrinsic electrocaloric effect in ultrathin ferroelectric capacitors*." ***Applied Physics Letters*** *2012*, 100, 192902/1-4.
30. **Yang Liu*** and Xingping Peng, "*Validity of nonlinear thermodynamic models in ferroelectric-paraelectric bilayers and superlattices*." ***Chinese Physics Letters*** *2012*, 29, 057701/1-4.
31. **Yang Liu*** and Xingping Peng, "*Space charge effect on the ferroelectricity in epitaxial ferroelectric-paraelectric superlattices*." ***Applied Physics Express*** *2012*, 5, 011501/1-3.

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32. **Yang Liu*** and Xingping Peng, "*Electrostatic coupling with interfacial free charge in ferroelectric-paraelectric bilayers and superlattices*." ***Physics Letters A*** *2011*, 375, 4091-4094.
33. **Yang Liu*** and Xingping Peng, "*Strain effects of the structural characteristics of ferroelectric transition in single-domain epitaxial $BiFeO_3$ films*." ***Chinese Physics Letters*** *2011*, 28, 067702/1-4.
34. Peng Wang, Lingmin Yao, Zhongbin Pan,* Songhan Shi, Jinhong Yu, Yao Zhou, **Yang Liu**, Jinjun Liu, Qingguo Chi, Jiwei Zhai, and Qing Wang*, "Ultrahigh energy storage performance of layered polymer nanocomposites over a broad temperature range." ***Advanced Materials*** *on line* https://doi.org/10.1002/adma.202103338
35. Zheng-Dong Luo*, Ming-Min Yang, Yang Liu, and Marin Alexe*, "*Emerging opportunities for 2D semiconductor/ferroelectric transistor-structure devices*." ***Advanced Materials*** *2021*, 33, 2005620.
36. Wenru Li†, Gang Tang†, Guangzu Zhang*, Hasnain Mehdi Jafri, Jun Zhou, Di Liu, **Yang Liu**, Jiesu Wang, Kuijuan Jin, Yongmin Hu, Haoshuang Gu, Zhao Wang, Jiawang Hong*, Houbing Huang*, Long-Qing Chen, Shenglin Jiang, and Qing Wang*, "*Improper molecular ferroelectrics with simultaneous ultrahigh pyroelectricity and figures of merit*." ***Science Advance*** *2021*, 7, eabe3068.
37. Li Li, Jingsai Cheng, Yunyun Cheng, Ting Han, **Yang Liu**, Yao Zhou, Guanghui Zhao, Yan Zhao, Chuanxi Xiong, Lijie Dong*, Qing Wang*, ***Advanced Materials*** *on line* https://onlinelibrary.wiley.com/doi/abs/10.1002/adma.202102392
38. Lulu Ren, He Li, Zongliang Xie, Ding Ai, Yao Zhou, **Yang Liu**, Siyu Zhang, Lijun Yang, Xuetong Zhao*, Zongren Peng, Ruijin Liao, Qing Wang*, ***Advanced Energy Materials*** *on line* https://onlinelibrary.wiley.com/doi/abs/10.1002/aenm.202101297
39. He Li†, Yao Zhou†, **Yang Liu**, Li Li, Yi Liu*, and Qing Wang*, "*Dielectric Polymers for High-Temperature Capacitive Energy Storage*." ***Chemical Society Reviews*** *on line*. https://doi.org/10.1039/D0CS00765J
40. He Li, Tiannan Yang, Yao Zhou, Ding Ai, Bin Yao, **Yang Liu**, Li Li, Long-Qing Chen, and Qing Wang*, "*Enabling high-energ-density high-eficiency ferroelectric polymer nanocomposites with rationally designed nanofillers*." ***Advanced Functional Materials*** *2020*, 31, 2006739.
41. Wenhan Xu, Zhubing Han, **Yang Liu**, Xin Chen, He Li, Lulu Ren, Qiming Zhang, and Qing Wang*, "*Composition dependence of microstructures and ferroelectric properties in poly(vinylidene fluoride-ter-trifluoroethylene-ter-chlorodifluoroethylene) terpolymers*." ***Macromolecules*** *2020*, 53, 3139-3147.
42. He Li, Lulu Ren, Ding Ai, Zhubing Han, **Yang Liu**, Bing Yao, and Qing Wang*, "*Ternary polymer nanocomposites with concurrently enhanced dielectric constant and breakdown strength for high-temperature electrostatic capacitors*." ***InfoMat*** *2020*, 2, 389-400.
43. Mei Li, Yunming Wang*, Zhaohan Yu, Yue Fu, Jiaqi Zheng, **Yang Liu**, Jingqiang Cui, Huamin Zhou, and Dequn Li, "*Self-powered infrared-responsive electronic skin employing piezoelectric nanofiber nanocomposites driven by microphase transition*." ***ACS Applied Materials & Interfaces*** *2020*, 12, 13165-13173.
44. Ran Su, Dawei Zhang, Ming Wu, Fatang Li*, **Yang Liu**, Zhipeng Wang, Congcong Xu, Xiaojie Lou, Qiang Yu*, and Yaodong Yang, "*Plasmonic-enhanced ferroelectric photovoltaic effect in 0-3 type $BaTiO_3$-Au ceramics*." ***Journal of Alloys and Compounds*** *2019*, 785, 584-589.
45. Guangzu Zhang, Lingxi Weng, Zhaoyao Hu, **Yang Liu**, Runxi Bao, Peng Zhao, Hao Feng, Nuo Yang, Ming-Yu Li, Sulin Zhang, Shenglin Jiang*, and Qing Wang*, "*Nanoconfinement-induced giant*

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*electrocaloric effect in ferroelectric polymer nanowire array integrated with aluminum oxide membrane to exhibit record cooling power density*." ***Advanced Materials*** *2019*, 31, 1806642.

46. Qi Li, Fang-Zhou Yao, **Yang Liu**, Guangzu Zhang, Hong Wang*, Qing Wang*, "*High-temperature dielectric materials for electrical energy storage*." ***Annual Review of Materials Research*** *2018*, 48, 219-243.
47. Houbing Huang*, Guangzu Zhang*, Xingqiao Ma, Deshan Liang, Jianjun Wang, **Yang Liu**, Qing Wang, Long-Qing Chen*, "*Size effects of electrocaloric cooling in ferroelectric nanowires*." ***Journal of the American Ceramic Society*** *2018*, 101, 1566-1575.
48. Weimin Xia*, Bing Chen, **Yang Liu**, Qing Wang, Zhicheng Zhang*, "*Low Young's moduli induced D-E loop dispersion and its effect on the energy discharging performance of PVDF and P(VDF-co-HFP) films*." ***AIP Advances*** *2018*, 8, 035211.
49. Meng Shen, Shenglin Jiang, Mingyu Li, **Yang Liu**, Huan Liu, Pin Liu, Baoyan Fan, Shiyong Qiu, Guangzu Zhang*, Qing Wang*, "*Giant electrocaloric effect of free-standing* $Pb_{0.85}La_{0.1}(Zr_{0.65}Ti_{0.35})O_3$ *thick films fabricated by the self-lift-off screen printing method*." ***Ceramics International*** *2018*, 44, 193-200.
50. Guangzu Zhang, Baoyan Fan, Peng Zhao, Zhaoyao Hu, **Yang Liu**, Feihua Liu, Shenglin Jiang, Sulin Zhang, Honglang Li, Qing Wang*, "*Ferroelectric polymer nanocomposites with complementary nanostructured fillers for electrocaloric cooling with high power density and great efficiency*." ***ACS Applied Energy Materials*** *2018*, 1, 1344-1354.
51. Weimin Xia*, Zhenji Zhou, **Yang Liu**, Qing Wang, Zhicheng Zhang*, "*Crystal phase transition dependence of the energy storage performance of poly (vinylidene fluoride) and poly (vinylidene fluoride-hexafluoropropene) copolymers*." ***Journal of Applied Polymer Science*** *2018*, 135, 46306.
52. Haibibu Aziguli, Xin Chen, **Yang Liu**, Guang Yang, Ping Yu*, Qing Wang*, "*Enhanced electrocaloric effect in lead-free organic and inorganic relaxor ferroelectric composites near room temperature*." ***Applied Physics Letters*** *2018*, 112, 193902.
53. Guangzu Zhang, Mo Chen, Baoyan Fan, Yang Liu, Mingyu Li, Shenglin Jiang, Houbing Huang, Huan Liu, Honglang Li, Qing Wang, "*High electrocaloric effect in hot-pressed PLZT ceramics with a wide operating temperature range*." ***Journal of the American Ceramic Society*** *2017*, 100, 4581-4589.
54. H. J. Harsan Ma*, J. Zhou, M. Yang, **Yang Liu**, S. W. Zeng, W. X. Zhou, L. C. Zhang, T. Venkatesan, Y. P. Feng, and Ariando*, "*Giant crystalline anisotropic magnetoresistance in nonmagnetic perovskite oxide heterostructures*." ***Physical Review B*** *2017*, 95, 155314/1-12.
55. Feihua Liu, Qi Li, Jin Cui, Zeyu Li, Guang Yang, **Yang Liu**, Lijie Dong, Chuanxi Xiong, Hong Wang, Qing Wang*, "*High-energy-density dielectric polymer nanocomposites with trilayered architecture*." ***Advanced Functional Materials*** *2017*, 27, 1606292.
56. Feihua Liu, Qi Li, Zeyu Li, **Yang Liu**, Lijie Dong, Chuanxi Xiong*, and Qing Wang*, "*Poly(methyl methacrylate)/boron nitride nanocomposites with enhanced energy density as high temperature dielectrics*." ***Composites Science and Technology*** *2017*, 142, 139-144.
57. Zhipeng Wang, Jianmin Song, Feng Gao, Ran Su, Dawei Zhang, **Yang Liu**, Congcong Xu, Xiaojie Lou, Yaodong Yang, "*Developing a ferroelectric nanohybrid for enhanced photocatalysis*." ***Chemical Communications*** *2017*, 53, 7596-7599.
58. Ran Su, Dawei Zhang, **Yang Liu**, Jiangbo Lu, Zhipeng Wang, Linglong Li, Jihong Bian, Ming Wu, Xiaojie Lou and Yaodong Yang, "*Novel lead-free ferroelectric film by ultra-small* $Ba_{0.8}Sr_{0.2}TiO_3$ *nanocubes assembled for a large electrocaloric effect*." ***Physical Chemistry Chemical Physics*** *2016*, 18, 29033-29040.

## PUBLICATIONS

59. Ran Su*, Zhengdong Luo, Dawei Zhang, **Yang Liu**, Zhipeng Wang, Junning Li, Jihong Bian, Yanxi Li, Xinghao Hu, Jinghui Gao, and Yaodong Yang*, "*High energy density performance of polymer nanocomposites induced by designed formation of $BaTiO_3$@sheet-like $TiO_2$ hybrid nanofillers*." ***Journal of Physical Chemistry C*** *2016*, 120, 11769-11776.
60. Jie Wei*, **Yang Liu**, Xiaofei Bai, Chen Li, Yalong Liu, Zhuo Xu, Raphael Haumount, Ingrid C. Infante, and Brahim Dkhil, "*Crystal structure, leakage conduction mechanism evolution and enhanced multiferroic properties in Y-doped $BiFeO_3$ ceramics*." ***Ceramics International*** *2016*, 6, 48779-48787.
61. Xiangjian Wang*, Gaoyang Gou, Dawei Wang, Haiyan Xiao, **Yang Liu**, Ming Zhang, Brahim Dkhil, Xiaobing Ren, and Xiaojie Lou*, "*Structural, electronic, and magnetic properties of metal-organic-framework perovskites $[AmH][Mn(HCOO)_3]$: a first-principle study*." ***RSC Advance*** *2016*, 6, 48779-48787.
62. Bobo Tian, J. L. Wang*, S. Fusil, **Yang Liu**, X. L. Zhao, S. Sun, S. Shen, T. Lin, J. L. Sun, C. D. Duan*, M. Bibes, A. Barthélémy, B. Dkhil, V. Garcia*, X. J. Meng, and J. H. Chu, "*Tunnel electroresistance through organic ferroelectrics*." ***Nature Communications*** *2016*, 7, 11502.
63. Xiaofei Bai, Jie Wei, Bobo Tian, **Yang Liu**, T. Reiss, N. Guiblin, P. Gemeiner, B. Dkhil, I. C. Infante, "*Size effect on optical and photocatalytic properties in $BiFeO_3$ nanoparticles*." ***Journal of Physical Chemistry C*** *2016*, 120, 3595-3601.
64. Yalong Liu, Jie Wei*, **Yang Liu**, Xiaofei Bai, Peng Shi, Shengchun Mao, Xueqian Zhang, Chen Li, and Brhaim Dkhil, "*Phase transition, leakage conduction mechanism evolution and enhanced ferroelectric properties in multiferroic Mn-doped $BiFeO_3$ thin films*." ***Journal of Materials Science Materials in Electronics*** *2016*, 27, 3095-3102.
65. Bobo Tian*, **Yang Liu**, Liufang Chen, Jianlu Wang, Shuo Sun, Hong Shen*, Jinglan Sun, Guoliang Yuan, Stéphane Fusil, Vincent Garcia, Brahim Dkhil*, Xiangjian Meng, and Junhao Chu, "*Space-charge effect on electroresistance in metal-ferroelectric-metal capacitors*." ***Scientific Reports*** *2015*, 5, 18297/1-9.
66. Bobo Tian, Liufang Chen, **Yang Liu**, Xiaofei Bai, Jianlu Wang, Shuo Sun, Guoliang Yuan, Jinglan Sun, Brahim Dkhil*, Xiangjian Meng*, and Junhao Chu, "*Homogenous ferroelectric switching in ultrathin film of polyvinylidene fluoride (PVDF) polymers*." ***Physical Review B: Rapid communications*** *2015*, 92, 060102(R)1-4.
67. Wenping Geng, **Yang Liu**, Xiaojie Lou*, Fuping Zhang, Qida Liu, Brahim Dkhil, Ming Zhang, Xiaobing Ren, Hongliang He, and Anquan Jiang*, "*Polarization fatigue in antiferroelectric $(Pb,La)(Zr,Ti)O_3$ thin films: the role of the effective strength of driving signal*." ***Ceramics International*** *2015*, 41, S289-S295.
68. Bobo Tian, Xiaofei Bai, **Yang Liu**, P. Gemeiner, X. L. Zhao, B. L. Liu, Y. H. Zou, X. D. Wang, H. Huang, J. L. Wang*, Sh. Sun, J. L. Sun, B. Dkhil*, X. J. Meng, and J. H. Chu "*β phase instability in Poly(vinylidene fluoride/trifluoroethylene) P(VDF-TrFE) thin films near β relaxation temperature*." ***Applied Physics Letters*** *2015*, 106, 092902/1-4.
69. Wenping Geng, Xiaojie Lou*, Jianghong Xu, Fuping Zhang, **Yang Liu**, Brahim Dkhil, Xiaobing Ren, Ming Zhang, and Hongliang He, "*Effective driving voltage on polarization fatigue in $(Pb,La)(Zr,Ti)O_3$ antiferroelectric thin films*." ***Ceramics International*** *2015*, 41, 109-114.

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70. Xiaojie Lou*, Hongjia Zhang, Zhengdong Luo, Fuping Zhang, **Yang Liu**, Qida Liu, Aiping Fang, Brahim Dkhil, Ming Zhang, Xiaobing Ren, and Hongliang He, "*Effect of polarization fatigue on the Rayleigh coefficients of ferroelectric lead zirconate titanate thin films: experimental evidence and implications*." ***Applied Physics Letters*** *2014*, 105, 102907/1-5.
71. Zhengdong Luo, Xiaojie Lou*, Fuping Zhang, **Yang Liu**, Dingding Chang, Chenqi Liu, Qida Liu, Brahim Dkhil, Ming Zhang, Xiaobing Ren, and Hongliang He, "*Rayleigh-like nonlinear dielectric response and its evolution during electrical fatigue in (Pb,La)(Zr,Ti)$O_3$ antiferroelectric thin film*." ***Applied Physics Letters*** *2014*, 104, 142904/1-5.
72. Ying-Long Wang*, Xing-Yuan Wang, **Yang Liu**, Bao-Ting Liu, and Guang-Sheng Fu*, "*The elimination of deviations of the mean-field Landau-type theory from the fancy size effect experiment in nanoscale ferroelectric $BaTiO_3$ capacitors*." ***Physics Letters A*** *2010*, 374, 4915-4918.

## ORAL PRESENTATIONS/POSTERS

- *Ferroelectric polymers: understanding and designing at the molecular level* (Invited), MRS Spring Meeting, US, 2021
- *Understanding and designing of ferroelectric polymers from a molecular perspective* (Invited), Ferroelectrics Young Investigator Series in ISAF-ISIF-PFM Joint Conference, Sydney, Australia, 2021.
- *Relaxor ferroelectric polymers: new molecular understanding and recent developments* (Invited), Electronic Materials and Applications (EMA), US, 2021.
- *Direct mapping of local polar distortion in relaxor ferroelectric polymers by using atomic force microscope infrared-spectroscopy* (Oral), APS March Meeting, US, 2021.
- *Structural insight into the interface effect in ferroelectric polymer nanocomposites* (Poster), APS March Meeting, US, 2021.
- *Structural insights into the local polar disorder in relaxor ferroelectric polymers* (Oral), Fundamental Physics of Ferroelectrics, US, 2021.
- *Ferroelectric polymers: formation of MPB-like behavior and origin of relaxor behavior* (Invited seminar), Physics Department and Institute of Nanoscience and Engineering, University of Arkansas, US, 2020.
- *Unveiling the origin of relaxor behavior in ferroelectric polymers* (Oral), MRS Fall meeting, Boston, US, 2020.
- *Revealing the morphotropic phase boundary in ferroelectric P(VDF-TrFE) copolymers* (Oral), Fundamental Physics of Ferroelectrics Workshop, Silver Spring, Maryland, US, 2020.
- *Discovery of the Morphotropic phase boundary in ferroelectric polymers* (Oral), MRS Fall meeting, Boston, US, 2019.
- *Giant inverse electrocaloirc effect in antiferroelectric La-doped Pb(ZrTi)$O_3$ thin films near room temperature* (Poster), Discussion Meeting entitled "Taking the temperature of phase transitions in cool materials", Royal Society, London, UK, 2016.
- *Ferroelectrics as solid state refrigerator: new insights* (Oral), E-MRS Spring Meeting, Lille, France, 2015
- *Coexistence of giant positive and negative electrocaloirc effect in antiferroelectric La-doped Pb(ZrTi)$O_3$ thin films near room temperature* (Poster), Ferroelectrics Workshop, Leysin, Switzerland, 2015.

## ORAL PRESENTATIONS/POSTERS

- *Giant negative electrocaloric effect in La-doped Pb(ZrTi)$O_3$ thin films near room temperature* (Oral), Chinese Materials Conference, Guiyang, China, 2015.
- *Giant room-temperature barocaloric effect and pressure-mediated electrocaloric effect in $BaTiO_3$ single crystal* (Poster), ISMTF 2014, Xiangtan, China, 2014.
- *Electrocaloric effect in ultrathin ferroelectric films* (Oral), ISAF-PFM, Penn State University, USA, 2014.
- *Bridging elastocaloric and electrocaloric effects by mechanical stress in ferroelectrics* (Oral), Domain Wall Workshop, Leysin, Switzerland, 2014.
- *Effect of a built-in electric field in asymmetric ferroelectric tunnel junctions* (Poster), ISAF-PFM, Prague, Czech, 2013.

## PARTICIPANT IN RESEARCH PROGRAM

- *Piezoenergetics Coupled Piezoelectric and Nanoenergetic Materials with Tailorable and Switchable Reactivity*, PI: Dr. Steven Son, Purdue University, Funding Agency: AFOSR MURI (FA9550-19-1-0008).
- *Skin-Inspired Mechanics of Liquid Metal - Elastomer Composites as Super Soft, Stretchable, and Tough Conductors*, PI: Sulin Zhang and Qing Wang, Penn State University, Funding Agency: NSF (Civil, Mechanical and Manufacturing Innovation-0754463/0644599).
- *High-performance dielectric capacitor at evaluated temperatures*, PI: Qing Wang, Penn State University, Funding Agency: ONR (N000141612082)

## PUBLICATIONS

- Q. Wang and **Y. Liu**, "*Piezoelectric polymers with the morphotropic compositions*". US. Patent Application No. 2018/4773 (2018).

## PROFESSIONAL AFFILIATION

Materials Research Society, American Physical Society, American Ceramic Society

## OTHER PROFESSIONAL ACTIVITIES

- Expert evaluator for Marie Curie fellowship;
- Reviewer for Czech Science Foundation;
- Reviewers for the textbook entitled "*Electrocaloric effect in ferroelectric metal oxides*" by Elsevier; the textbook entitled "*Physics principles of ferroelectrics*" by American Institute of Physics Publishing;
- Reviewers for *Science*, *Science Advance*, *Nature Communications*, *Advanced Materials*, *Advanced Functional Materials*, *Applied Physics Letters* etc