

主要工作

在博士期间,我的主要研究方向是铁电薄膜中极化畴分布及演化的相场模拟,我的工作为一部分新型纳米电子器件的研发提供了理论支持。截止 2023 年 2 月,共发表 SCI 论文 33 篇,参与撰写专业书籍 1 章,总引用 900 余次, h 因子 18。毕业前,我已经在主导开发支持并行运算的相场模拟软件集合 **μPRO**, 并探索如何商业转化。

毕业后,我加入了博士导师陈龙庆教授于 2020 年创办的 **MuPRO LLC** 继续开发介观模拟软件。基于对我个人能力和模拟软件的自信和公司发展的考量,我们决定不引入投资,而直接依靠销售收入支持公司运营。经过三年,**MuPRO** 公司成功存活下来,**μPRO** 作为全球第一款综合性的相场模拟商业软件,现版本包括了铁电、磁学、介电击穿和有效性质计算模块,凝固、固态相变等模块仍在持续开发中。采购和试用的客户包括了清华大学、中国科学院、浙江大学、威斯康辛麦迪逊大学、三星等来自中国、美国、德国、韩国、日本的高校、企业,完成了数十万美元的销售额。

在 **MuPRO LLC**, 我是唯一的员工,需要处理模拟软件开发和商业化的所有相关工作,从开发针对超级计算机的并程序到开发针对个人电脑具备图形界面的跨平台软件,从硬件上搭建公司的两台开发和虚拟化机架式服务器到它们的维护管理,从编写公司各个网站到维护用户注册及许可证数据库,从设计产品宣传页到制作产品介绍视频,从国际贸易的销售供货到售后技术支持等等。通过三年的努力,我基本完成了公司设立初我们对产品开发的前期规划。

工作经历

2020/05 - 现在	模拟研究科学家, MuPRO LLC , 美国, 斯泰特克里奇 μPRO 计算材料介观模拟系列软件主要开发人员
2017 春, 2014 秋	助教 材料动力学 (本科)、材料热力学 (本科)

教育背景

2013 - 2020	材料科学与工程学院, 博士, 导师: 陈龙庆教授 宾夕法尼亚州立大学, 美国, GPA: 3.73/4.0 学位论文: Influence of defects on polarization distribution in ferroelectrics: a phase-field study, 2020/04/06 答辩
2009 - 2013	材料科学与工程学院, 学士, 优秀毕业生 上海交通大学, 中国, 核心成绩: 90.13/100, 排名: 6/140 学位论文: 富铝 AlAg 合金 GP 区的内耗研究, 2013/06/06 答辩

计算机技能

Fortran :主导开发了适用于超级计算机的相场模拟商业软件 **μPRO**

C :为 **μPRO** 跨平台桌面版开发了一系列 C 基础工具库

C++ :基于 VTK 和 Qt, 独立开发了 3D 数据可视化软件 **μViz**

跨平台 GUI :基于 Electronjs 和 Reactjs 开发了 **μPRO** 跨平台桌面版

Python :使用 pandas 分析数据, 使用 selenium 编写网络爬虫

Shell :独立开发了高通量计算任务生成工具 **htpStudio**

网页开发 :使用 Astrojs, Reactjs, Vuejs, AWS Lambda、SES、DynamoDB 等

其他 :Latex, Git, CMake, Jenkins, Blender, OpenGL 等

代表性工作

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- [1] **Xiaoxing Cheng**, Qiwu Shi, Eric Parsonnet, Natalya Fedorova, Ren-Ci Peng, Abel Fernandez, Alexander Qualls, Xiaoxi Huang, Xue Chang, Hongrui Zhang, David Pesquera, Sujit Das, Dmitri Nikonov, Ian Young, Long-Qing Chen, Lane W. Martin, Yen-Lin Huang, Jorge Íñiguez, and Ramamoorthy Ramesh. The role of lattice dynamics in ferroelectric switching. *Nature Communications*, 13(1):1110, March 2022, IF=17.694.
 - [2] **Xiaoxing Cheng**, Ren-Ci Pen, Bin Peng, Ziyao Zhou, Long-Qing Chen, and Ming Liu. Domain patterns and super-elasticity of freestanding BiFeO₃ membranes via phase-field simulations. *Acta Materialia*, 208:116689, April 2021, IF=9.209.
 - [3] **Xiaoxing Cheng**, Yen-Lin Huang, Lu Zheng, Peng Chen, Shang-Lin Hsu, Tiannan Yang, Xiaoyu Wu, Louis Ponet, Ramamoorthy Ramesh, Long-Qing Chen, Sergey Artyukhin, Ying-Hao Chu, and Keji Lai. Unexpected Giant Microwave Conductivity in a Nominally Silent BiFeO₃ Domain Wall. *Advanced Materials*, 32(9):1905132, 2020, IF=32.086.
 - [4] Linze Li, **Xiaoxing Cheng**, Thomas Blum, Huaixun Huyan, Yi Zhang, Colin Heikes, Xingxu Yan, Chaitanya Gadre, Toshihiro Aoki, Mingjie Xu, Lin Xie, Zijian Hong, Carolina Adamo, Darrell G. Schlom, Long-Qing Chen, and Xiaoqing Pan. Observation of Strong Polarization Enhancement in Ferroelectric Tunnel Junctions. *Nano Letters*, 19(10):6812–6818, October 2019, IF=12.262.
 - [5] Linze Li, **Xiaoxing Cheng**, Jacob R Jokisaari, Peng Gao, Jason Britson, Carolina Adamo, Colin Heikes, Darrell G Schlom, Long-Qing Chen, and Xiaoqing Pan. Defect-induced hedgehog polarization states in multiferroics. *Physical Review Letters*, 120(13):137602, 2018, IF=9.185.
 - [6] Zi Long Bai, **Xiao Xing Cheng**, Dong Fang Chen, David Wei Zhang, Long-Qing Chen, James F. Scott, Cheol Seong Hwang, and An Quan Jiang. Hierarchical Domain Structure and Extremely Large Wall Current in Epitaxial BiFeO₃ Thin Films. *Advanced Functional Materials*, 28(31):1801725, 2018, IF=19.924.

会议

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- [1] **Xiaoxing Cheng**, Jason Britson, and Long-Qing Chen. Grain boundary's influence on the spontaneous polarization configuration in PZT. In *Third International Symposium on Phase-field Method*, State College, PA, USA, August 2014.
 - [2] **Xiaoxing Cheng**, Jason Britson, and Long-Qing Chen. Influence of single coherent twin grain boundary on ferroelectric domain configuration in PZT system. In *Materials Science and Technology*, Pittsburgh, PA, USA, October 2014.
 - [3] **Xiaoxing Cheng** and Long-Qing Chen. Polarization around dislocation in SrTiO₃, the role of flexoelectricity, electrostriction and defect charges. In *Fundamental Physics of Ferroelectrics and Related Materials 2020*, Silver Spring, MD, USA, January 2020.

书籍、论文

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- [1] Igor Batraev, Saurabh Chaitanya, **Xiaoxing Cheng**, Dina V Dudina, Vijayan Krishnaraj, Ravinder Kumar, Yue Li, Weijie Lu, Alakesh Manna, José Miguel Molina Jordá, et al. *Metal Matrix Composites: Materials, Manufacturing and Engineering*, volume 3. Walter de Gruyter GmbH & Co KG, 2014.

- [2] B. Winchester, N. Balke, **Xiaoxing Cheng**, A. N. Morozovska, S. Kalinin, and L. Q. Chen. Electroelastic fields in artificially created vortex cores in epitaxial BiFeO₃ thin films. *Applied Physics Letters*, 107(5):052903, August 2015.
- [3] Jia-Mian Hu, Tiannan Yang, Kasra Momeni, **Xiaoxing Cheng**, Lei Chen, Shiming Lei, Shujun Zhang, Susan Trolier-McKinstry, Venkatraman Gopalan, Gregory P. Carman, Ce-Wen Nan, and Long-Qing Chen. Fast Magnetic Domain-Wall Motion in a Ring-Shaped Nanowire Driven by a Voltage. *Nano Letters*, 16(4):2341–2348, April 2016.
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- [7] Yongbiao Wang, Liming Peng, Yanzhou Ji, **Xiaoxing Cheng**, Cunlong Wang, Yujuan Wu, Yanan Fu, and Long-Qing Chen. Effect of cooling rates on the dendritic morphology transition of Mg–Gd alloy by in situ X-ray radiography. *Journal of Materials Science & Technology*, 34(7):1142–1148, 2018.
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- [10] Zi Long Bai, **Xiao Xing Cheng**, Dong Fang Chen, David Wei Zhang, Long-Qing Chen, James F. Scott, Cheol Seong Hwang, and An Quan Jiang. Hierarchical Domain Structure and Extremely Large Wall Current in Epitaxial BiFeO₃ Thin Films. *Advanced Functional Materials*, 28(31):1801725, 2018.
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