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个人简介：

刘亲壮, 1981 年 5 月出生, 理学博士，教授，博士生导师，安徽省领军人才特聘教授，安徽省高水平导师，安徽省学科方向带头人，学术骨干，相山学者，优秀教育工作者，安徽省百篇优秀硕士学位论文指导教师，美国田纳西大学访问学者。1999.9-2003.7 安徽大学物理系应用物理学专业学士；2003.9-2009.6 中国科学技术大学合肥微尺度物质科学国家实验室凝聚态物理专业博士；2009.7 - 至今 淮北师范大学物理与电子信息学院教师、副院长。

主要从事功能氧化物薄膜材料和外延异质结方面的研究，多年来一直专注新型宽带隙半导体锡酸盐薄膜的制备和性能研究，制备了高透明和高电导的新型透明导电锡酸盐薄膜，并通过掺杂、应力等调控手段，实现了锡酸盐薄膜材料带隙的大范围调控。先后主持国家自然科学基金项目 2 项，安徽省自然科学基金 2 项，安徽省优秀科研创新团队 1 项，安徽高校自然科学研究重大和重点项目各 1 项，安徽省优秀青年人才重点项目 1 项，淮北市科技人才培育计划项目 1 项，以及安徽省“协同创新中心”子课题 1 项，总经费 500 余万元。科研成果转化 3 项，费用 39 万元。先后在 *Appl. Phys. Lett., ACS Appl.Mater.Interfaces, Journal of Materials Chemistry C, Europhys. Lett.*等 SCI 检索刊物上发表学术论文 40 余篇，授权国家发明专利 4 项。2013 和 2016 年获安徽省第七届自然科学优秀论文三等奖，2012 年获校十一五“科研先进个人”称号，2014 年评为校“学术骨干”，2016 年评为校“优秀教育工作者”，2020 年获“相山学者”称号，2020 年“优秀研究生导师”。2022 年安徽省“高水平导师”。2024 年省领军人才特聘教授。

承担的科研和教学项目：

1. 主持功能薄膜与器件优秀科研创新团队项目，经费 200 万，项目编号：2024AH010027，2024.07-2027.06；
2. 主持国家自然科学基金面上项目 “锡酸盐 $ASnO_3$(A=Sr,Ba)薄膜能带原位应变调控及铁电场效应晶体管的制备研究”（项目编号：11974127），2020.01-2023.12；
3. 主持国家自然科学青年基金：钙钛矿结构 Sn 基透明导电膜及异质结的制备与物性研究，批准号：11004071，2010.01-2012.12；
4. 主持安徽省自然科学基金面上基金项目“钙钛矿锡酸盐薄膜结构和物性的应变调控研究”，（项目编号：2008085MA19），2020.01-2021.12；
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6. 主持安徽省高校自然科学基金重大项目（项目编号：KJ2019ZD40） “新型宽带隙半导体锡酸盐 $ASnO_3$(A=Sr,Ba)薄膜的禁带宽度调控研究”，2019.01-2021.12；
7. 主持安徽省高校自然科学研究重点项目：“钙钛矿结构 $BaSnO_3$ 及其掺杂薄膜的结构、电输运和磁性质研究”，项目编号：KJ2015A095，2015.01-2016.12；

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10. 主持淮北市人才培育项目“新型透明导电膜玻璃的研究和制备”，项目编号：20130304
11. 主持校级教研项目：材料物理课程教学改革与实践，项目批准号：jy14139。
12. 省级质量工程项目：材料物理一流本科人才示范引领基地，项目编号：2019rcsfjd043

代表论文：

1. Xiaoman Yang, Tong Zhou, Enda Hua, Zhongliao Wang, Zhongliang Liu, Haifeng Wang and **Qinzhuang Liu*(通讯)**, Composition Dependent Structure and Bandgaps in $Hf_xZr_{1-x}O_2$ Thin Films, *Applied Physics Letters*,124, 122902 (2024).
2. Tong Zhou, Xiaoman Yang, Jian Yuan and **Qinzhuang Liu*(通讯)**, Effect of substrate on structural and transport properties of $La_{0.05}Sr_{0.95}SnO_3$ and $La_{0.05}Ba_{0.95}SnO_3$ epitaxial films, *Journal of Alloys and Compounds*, 984, 173953(2024).
3. Haozhe Li, Kai Zhang, Xiu Li, Baiquan Liu, Lianbi Li, Zengxia Mei, Tongsheng Chen ,**Qinzhuang Liu*(通讯)** , Wenzhi Yu, Jian Yuan, Haoran Mub, Shenghuang Lin, Two-dimensional (2D) a-In_2Se_3/Ta_2NiSe_5 heterojunction photodetector with high sensitivity and fast response in a wide spectral range, *Materials & Design*, 227, 111799 (2023).
4. Haozhe Li, Jian Yuan, **Qinzhuang Liu*(通讯)**, Haoran Mu, Self-powered In_2Se_3/$PtSe_2$ photodetector with broadband and fast response, *Materials Letters*,344, 134425(2023).
5. Li Zhao, Haozhe Li, Kai Lv, Haifeng Wang, **Qinzhuang Liu*(通讯)**，Bandgap tuning, high electrical conductivity,and room-temperature ferromagnetism in La- and V-doped $SrSnO_3$ epitaxial films, *Applied Physics Letters,* 120, 153101 (2022).
6. Kaifeng Li, Li Zhao,Qiang Gao, Kai Lv, Lichang Yin，Haifeng Wang, **Qinzhuang Liu*(通讯)**，Strain effects in epitaxial La-doped $SrSnO_3$ films on lattice-matched PMN-PT substrates，*Journal of the American Ceramic Society*,105(2), 6284-6292, (2022).
7. Li Zhao, Kaifeng Li, Kai Lv, Jinfeng Zhang, Zhongliang Liu, Haifeng Wang, **Qinzhuang Liu*(通讯)**，Improved electrical and optical properties in epitaxial Cd_2SnO_4 films, *Journal of the American Ceramic Society,*105(2), 1220-1231, (2021).
8. Kaifeng Li,Qiang Gao, Li Zhao, Kai Lv, Lichang Yin, **Qinzhuang Liu*(通讯)**, Composition dependent mobility and bandgaps in $(La_{0.05}Ba_xSr_{0.95-x})SnO_3$ epitaxial films, *Applied Physics Letters*, 117(7):072101, (2020).
9. Kaifeng Li, Qiang Gao, Li Zhao, **Qinzhuang Liu*(通讯)**, Transparent and conductive Sm-doped $SrSnO_3$ epitaxial films, *Optical Materials*, 107, 110139, (2020).
10. Kaifeng Li，Qiang Gao，Li Zhao，**Qinzhuang Liu*(通讯)**, Electrical and Optical Properties of Nb-doped $SrSnO_3$ Epitaxial Films Deposited by Pulsed Laser Deposition, *Nanoscale Research Letters*, 15:164 (2020).
11. Qiang Gao，Kaifeng Li，Li Zhao，Kai Lv，Hong Li，Jinfeng Zhang，Wenhan Du，**Qinzhuang Liu*(通讯)**, Wide range bandgap modulation in strained $SrSnO_3$ epitaxial films, *Journal of Materials Chemistry C*, 8, 3545-3552, (2020).
12. Qiang Gao, Kaifeng Li, Li Zhao, Kaiyin Zhang, Hong Li, Jinfeng Zhang, and **Qinzhuang Liu*(通讯)**, Wide-Range Band-Gap Tuning and High Electrical Conductivity in La- and

Pb-Doped $SrSnO_3$ Epitaxial Films. *ACS Appl. Mater. Interfaces,* 11, 25605−25612 (2019).

13. Qiang Gao, Kaifeng Li, Kaiyin Zhang, Jinfeng Zhang, and **Qinzhuang Liu*(通讯)**, Structure and bandgap nonlinearity in $BaSn_{1-x}Ti_xO_3$ epitaxial films, *Applied Physics Letters,* 114, 081901 (2019).

14. Hong Li, Hongyan Lu, Shulong Liu, Qiang Li, **Qinzhuang Liu*(通讯)**, SiO_2 shell on ZnO nanoflake arrays for UV-durable superhydrophobicity on Al substrate, *Materials Research Bulletin*, 114, 85-89 (2019).

15. Qiang Gao, Hengli Chen, Kaifeng Li, and **Qinzhuang Liu*(通讯)**, Band Gap Engineering and Room-Temperature Ferromagnetism by Oxygen Vacancies in $SrSnO_3$ Epitaxial Films, *ACS Appl. Mater. Interfaces*, 32,27503-27509 (2018).

16. **Qinzhuang Liu**, Feng Jin, Bing Li, Lei Geng, Structure and band gap energy of $CaSnO_3$ epitaxial films on $LaAlO_3$ substrate, *Journal of Alloys and Compounds*, 717: 55-61 (2017).

17. **Qinzhuang Liu**, Feng Jin, Guanyin Gao, Wei Wang, Ta doped $SrSnO_3$ epitaxial films as transparent conductive oxide, *Journal of Alloys and Compounds* 717:62-68 (2017).

18. Hong Li, Hongyan Liu, Yushan Li and **Qinzhuang Liu*(通讯)**, One-step hydrothermal fabrication and optical properties of ZnO nanoplate, *Modern Physics Letters* B,31:1750205 (2017).

19. **Qinzhuang Liu**, Feng Jin, Guanyin Gao, Bing Li, Yongxing Zhang, Qiangchun Liu, Transparent and conductive Ta doped $BaSnO_3$ films epitaxially grown on MgO substrate, *Journal of Alloys and Compounds*, 684:125~131 (2016).

20. **Qinzhuang Liu**, Feng Jin, Jianming Dai, Bing Li, Lei Geng, Jianjun Liu, Effect of thickness on the electrical and optical properties of epitaxial $(La_{0.07}Ba_{0.93})SnO_3$ thin films, *Superlattices and Microstructures*, 96:205~211 (2016).

21. **Qinzhuang Liu**, Jianming Dai, Yang Zhang, Hong Li, Bing Li, Zhongliang Liu, Wei Wang, High electrical conductivity in oxygen deficient $BaSnO_3$ films，*Journal of Alloys and Compounds,* 655:389~394 (2016).

22. Bing Li, **Qinzhuang Liu*(通讯)**, Yongxing Zhang, Zhongliang Liu, Lei Geng, Highly conductive Nb doped $BaSnO_3$ thin films on MgO substrates by pulsed laser deposition, *Journal of Alloys and Compounds*, 680, 343-349 (2016).

23. **Qinzhuang Liu**, Jianming Dai, Hong Li, Bing Li, Yongxing Zhang, Kai Dai, San Chen, Optical and transport properties of Gd doped $BaSnO_3$ epitaxial films，*Journal of Alloys and Compounds,* 647:959~964 (2015).

24. **Qinzhuang Liu**, Bing Li, Hong Li, Kai Dai, Guangping Zhu, Wei Wang, Yongxing Zhang, Guanyin Gao, Jianming Dai, Composition dependence of structural and optical properties in epitaxial $Sr(Sn_{1-x}Ti_x)O_3$ films, *Japanese Journal of Applied Physics*, 54:031101 (2015).

25. **Qinzhuang Liu**, Hong Li, Bing Li, Wei Wang, Qiangchun Liu, Yongxing Zhang, Jianming Dai, Structure and band gap engineering of Fe-doped $SrSnO_3$ epitaxial films, *EPL*, 108:37003 (2014).

26. **Qinzhuang Liu**, Yunhua He, Hong Li, Bing Li, Guanyin Gao, Lele Fan, Jianming Dai, Room-temperature ferromagnetism in transparent Mn-doped $BaSnO_3$ epitaxial films, *Applied Physics Express*, 7:033006 (2014).

27. **Qinzhuang Liu**, Hong Li, Bing Li, Qiangchun Liu, Guangping Zhu, Kai Dai, Zhongliang Liu, Jianjun Liu, Jianming Dai, Rectifying property and magnetoresistance of manganite-stannate junctions, *Solid State Communications,*173:30~33 (2013).

28. **Qinzhuang Liu**, Hong Li, Lele Fan, Epitaxial $BiFe_{0.95}Mn_{0.05}O_3$ thin films on transparent $La_{0.07}Ba_{0.93}SnO_3$ electrodes, *Journal of Alloys and Compounds*, 581:479~483 (2013).

29. **Qinzhuang Liu**, Bing Li, Jianjun Liu, Hong Li, Zhongliang Liu, Kai Dai, Guangping Zhu, Peng Zhang, Feng Chen, Jianming Dai, Structure and band gap tuning of transparent $(Ba_{1-x}Sr_x)SnO_3$ thin films epitaxially grown on MgO substrates, *EPL*, 98:47010 (2012).

30. **Qinzhuang Liu**, Jianjun Liu, Bing Li, Hong Li, Guangping Zhu, Kai Dai, Zhongliang Liu, Peng Zhang, Jianming Dai, Composition dependent metal-semiconductor transition in transparent and conductive La-doped $BaSnO_3$ epitaxial films, *Applied Physics Letters*, 101:241901 (2012).

31. **Qinzhuang Liu**, Jianming Dai, Xiaobo Zhang, Guangping Zhu, Zhongliang Liu Guohua Ding, Perovskite-type transparent and conductive oxide films: Sb- and Nd-doped $SrSnO_3$, *Thin Solid Films,* 519:6059~6063 (2011).

32. **Qinzhuang Liu**, Jianming Dai, Zhongliang Liu, Xiaobo Zhang, Guangping Zhu, Guohua Ding, Electrical and optical properties of Sb-doped $BaSnO_3$ epitaxial films grown by pulsed laser deposition, *Journal of Physics D-Applied Physics*,43:455401 (2010).

33. **Qinzhuang Liu**, Haifeng Wang, Feng Chen, Wenbin Wu, Single-crystalline transparent and conductive oxide films with the perovskite structure:Sb-doped $SrSnO_3$, *Journal of Applied Physics,* 103:093709 (2008).

34. 发明专利：**刘亲壮** 李兵,具有钙钛矿结构的未掺杂透明导电氧化物薄膜，专利号:ZL201510177538.4，2017 年。

科研和教学获奖：

1. 2012 年校“科研先进个人”；
2. 2013 年校首届高校辅导员职业技能大赛三等奖
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