



快速导航

研究员

副研究员

客座教授

工程师

助理研究员

博士后

行政助理

高级助理

当前所在位置: 首页 > 研究队伍 > 副研究员

张明晓 副研究员

时间: 2012-11-06

字体大小: **AAA**

张明晓, 中科院磁性材料与器件重点实验室, 磁性相变材料团队, 博士, 副研究员, 硕士生导师。

招生方向: 材料物理与化学、材料加工工程、材料学、材料与化工

研究方向: 稀土磁性材料的应用基础研究及产业化推广

课题组科研项目经费充足, 学术氛围浓厚, 学生发展前景广阔。

本人每年拟招收学术和专业硕士研究生共3名, 欢迎热爱科研的有志青年报考!

邮箱: mxzhang@nimte.ac.cn

电话: 0574-86685142

2002年至2009年, 在山东大学材料科学与工程学院学习, 先后获得工学学士和硕士学位。2013年, 毕业于中国科学院宁波材料技术与工程研究所, 获工学博士学位。2013年至2015年, 在中国科学院宁波材料技术与工程研究所/中科院上海硅酸盐研究所从事博士后研究, 出站后留宁波材料所工作。长期从事稀土磁性材料的探索、复合材料制备和成型以及相关性能调控研究。先后主持国家自然科学基金、浙江省自然科学基金、中国博士后科学基金、宁波市自然科学基金等项目。在国际磁学与磁性材料大会、中国稀土学会学术交流会、全国磁热效应材料和磁制冷技术学术研讨会等学术会议上作口头报告/墙报10余次(其中邀请报告3次)。在Acta Mater., Scripta Mater., J. Alloys. Comp., J. Magn. Magn. Mater. 等杂志上发表SCI论文近40篇, 申请/授权发明专利10余项, 获得宁波市科技进步奖1项, 2019年入选“宁波市领军和拔尖人才培养工程”。至今, 协助团队负责人指导数名硕博研究生, 其中已毕业5名。

主持或主要参与项目:

1. 国家自然科学基金面上项目, 52071328, La-Fe-Si/Fe磁制冷复合材料的塑性变形和各向异性导热研究, 2021/01-2024/12, 58万, 在研, 负责人
2. 宁波市自然科学基金重点项目, 202003N4028, 利用磁弹耦合原位表征技术研究磁热材料在微纳尺度下的相变行为, 2020/07-2023/06, 20万, 在研, 负责人
3. 宁波市“科技创新2025”重大专项, 2020Z063, 稀土磁制冷材料的可控凝固、塑性成型及磁热效应研究, 2020/06-2023/05, 300万, 在研, 参与/第二负责人
4. 国家重点研发计划课题, 稀土磁制冷材料的高通量制备和关键成型技术研究, 2017YFB0702703, 337.5万, 2017/07-2021/06, 在研, 参与
5. 国家自然科学基金面上项目, 51771218, 低滞后巨弹热磁性形状记忆合金的设计研究, 2018/01-2021/12, 60万, 在研, 参与
6. 国家自然科学基金青年科学基金项目, 51601208, 1:5型钕钴基取向多晶合金的各向异性磁热效应研究, 2017/01-2019/12, 20万, 结题, 负责人

7. 浙江省自然科学基金一般（面上）项目，LY16E010002，La-Fe-Si 磁制冷材料的快速成相机理与巨磁热效应研究，2016/01-2018/12，8万，结题，负责人
8. 中国博士后科学基金面上项目，2013M541553，晶态/非晶态磁制冷复合材料的热压制备及性能研究，2013/07-2014/09，5万，结题，负责人
9. 横店集团东磁股份有限公司，梯度型LaFeSi基室温制冷材料的研发，2016/01-2017/10，50万，结题，负责人

#### 近期论文与专利:

1. Xiang Lu, Yifei Zhang, Fengqing Wang, Mingxiao Zhang\*, Jian Liu\*, On the Microstructural Evolution and Accelerated Magnetocaloric Phase Formation in La-Fe-Si Alloys by Hot Forging Deformation, *Acta Materialia* 221 (2021)117334.
2. Jinyang Li, Yanfeng Liu, Xiang Lu, Yifei Zhang, Jianping Guo, Mingxiao Zhang\*, Jian Liu\*, Enhanced refrigeration capacity in Ho<sub>1-x</sub>Dy<sub>x</sub>B<sub>2</sub> compounds around liquid hydrogen temperature, *Journal of Alloys and Compounds* 864(2021)158757.
3. Yanfeng Liu, Xiaoqian Fu, Qian Yu, Mingxiao Zhang, Jian Liu\*, Significant reduction of phase-transition hysteresis for magnetocaloric (La<sub>1-x</sub>Ce<sub>x</sub>)<sub>2</sub>Fe<sub>11</sub>Si<sub>2</sub>H<sub>y</sub> alloys by microstructural manipulation, *Acta Materialia* 207(2021)116687.
4. Kun Wang, Yi Ouyang, Yi Shen, Yifei Zhang, Mingxiao Zhang\*, Jian Liu\*, High-throughput characterization of the diabatic temperature change for magnetocaloric materials, *Journal of Materials Science* 56(2021)2332-2340.
5. Yanyan Shao, Yanfeng Liu, Kun Wang, Mingxiao Zhang, Jian Liu\*, Impact of interface structure on functionality in hot-pressed La-Fe-Si/Fe magnetocaloric composites, *Acta Materialia* 195(2020)163-171.
6. Mingxiao Zhang\*, Kun Wang, Jian Liu, Lei Liu, Aru Yan, Rotating magnetocaloric effect and thermal transport properties in sintered Nd<sub>0.8</sub>Pr<sub>0.2</sub>Co<sub>5</sub> alloy, *Journal of Rare Earths* 38(2020)606-611.
7. Yi Ouyang, Mingxiao Zhang, Aru Yan, Wen Wang, Francois Guillou, Jian Liu\*, Plastically deformed La-Fe-Si: Microstructural evolution, magnetocaloric effect and anisotropic thermal conductivity, *Acta Materialia* 187(2020)1-11.
8. Mingxiao Zhang, Yi Ouyang, Yifei Zhang, Jian Liu\*, LaFe<sub>11</sub>Co<sub>0.8</sub>Si<sub>1.2</sub>/Al magnetocaloric composites prepared by hot pressing, *Journal of Alloys and Compounds* 823(2020)153846.
9. Kun Wang, Mingxiao Zhang\*, Yi Ouyang, Jian Liu, Hu. Zhang, Enhancement of rotating magnetocaloric effect by Fe substitution in NdCo<sub>5-x</sub>Fe<sub>x</sub> alloys, *Intermetallics* 118(2020)106676.
10. Fengyu Kong, Mingxiao Zhang, Anding Wang \*, Chain-Tsuan Liu\*, Mechanism of synergistic alloying effects on glass-forming ability of magnetic metallic glasses, *Intermetallics* 123 (2020) 106833
11. Yi Ouyang, Heng Zhang, Mingxiao Zhang, Jian Liu\*, Guoxin Yu, Zhenyu Liu, Simultaneous achievement of enhanced thermal conductivity and large magnetic entropy change in La-Fe-Si-H /Sn composites by optimizing interface contacts and hot pressing parameters, *Journal of Alloys and Compounds* 804(2019)49-56.
12. Kun Wang, Mingxiao Zhang\*, Jian Liu, Hubin Luo, Jie Sun, Crystal structure, spin reorientation, and rotating magnetocaloric properties of NdCo<sub>5-x</sub>Si<sub>x</sub> compounds, *Journal of Applied Physics* 125(2019)243901.
13. Yi Ouyang, Mingxiao Zhang, Jun Li, Aru Yan, Jian Liu\*, A high throughput study of magnetocaloric materials: Gradient solidification applied to La-Fe-Si, *Intermetallics* 108(2019)100-108.
14. Jian Yang, Yanyan Shao, Mingxiao Zhang\*, Yanfeng Liu, Aru Yan, Jian Liu\*, The influence of Ce on microstructure, phase formation and magnetocaloric properties in off-stoichiometric La<sub>2-x</sub>Ce<sub>x</sub>Fe<sub>11</sub>Si<sub>2</sub> alloys, *Intermetallics* 103(2018)97-100.
15. Yanyan Shao, Binfeng Lu, Mingxiao Zhang, Jian Liu\*, An X-ray absorption spectroscopy study of La-Fe-Si-(H) magnetocaloric alloys, *Acta Materialia* 150(2018)206-212.
16. Wen Sun, Jian Liu\*, Dewei Zhao, Mingxiao Zhang, Directional solidification and elastocaloric effect in a Ni<sub>45</sub>Mn<sub>44</sub>Sn<sub>11</sub> magnetic shape memory alloy, *Journal of Physics D: Applied Physics* 50(2017)444001.
17. Heng Zhang, Mingxiao Zhang, Yanyan Shao, Lihui Zhu\*, Jian Liu\*, Microstructure and magnetocaloric properties of non-stoichiometric La<sub>1.5</sub>Fe<sub>12.2-x</sub>Co<sub>0.8</sub>Si<sub>6</sub> alloys, *Journal of Alloys and Compounds* 720(2017)432-436
18. Dewei Zhao, Jian Liu\*, Xian Chen, Wen Sun, Yang Li, Mingxiao Zhang, Yanyan Shao, Heng Zhang, Aru Yan, Giant caloric effect of low hysteresis metamagnetic shape memory alloys with exceptional cyclic functionality, *Acta Materialia* 133(2017)217-223.
19. Yanyan Shao, Jian Liu\*, Mingxiao Zhang, Aru Yan, Konstantin P. Skokov, Dmitriy Yu Karpenkov, Oliver Gutfleisch, High-performance solid-state cooling materials: Balancing magnetocaloric and non-magnetic properties in dual

- I phase La-Fe-Si, Acta Materialia 125(2017)506-512.
20. Jian Liu\*, Chun He, Mingxiao Zhang, Aru Yan, A systematic study of the microstructure, phase formation and magnetocaloric properties in off-stoichiometric La-Fe-Si alloys, Acta Materialia 118(2016)44-53.
21. Heng Zhang, Jian Liu\*, Mingxiao Zhang\*, Yanyan Shao, Yang Li, Aru Yan, LaFe<sub>11.6</sub>Si<sub>1.4</sub>Hf/Sn magnetocaloric composites by hot pressing, Scripta Materialia 120(2016) 58-61.
22. Yanyan Shao, Mingxiao Zhang, Hubin Luo, Aru Yan, Jian Liu\*, Enhanced thermal conductivity in off-stoichiometric La-(Fe,Co)-Si magnetocaloric alloys, Applied Physics Letters 107(2015)152403.
23. Mingxiao Zhang, Zhongtian Zhang, Chun He, Yanyan Shao, Jian Liu\*, Aru Yan, Microstructure and magnetocaloric properties of LaFe<sub>11.8-x</sub>CoxSi<sub>1.2</sub> strip-cast flakes, IEEE Transactions on Magnetics (11), 51 (2015) 2502404.
24. M.X. Zhang, J. Liu\*, Y. Zhang, J.D. Dong, A.R. Yan, K.P. Skokov, O. Gutfleisch, Large entropy change, adiabatic temperature change, and small hysteresis in La(Fe,Mn)<sub>11.6</sub>Si<sub>1.4</sub> strip-cast flakes, Journal of Magnetism and Magnetic Materials 377 (2015) 90-94.
25. Mingxiao Zhang\*, Jiawei Li, Fanli Kong, Jian Liu\*, Magnetic properties and magnetocaloric effect of FeCrNbYB metallic glasses with high glass-forming ability, Intermetallics 59 (2015) 18-22.
26. He Chun, Zhang Ming-Xiao, Shao Yan-Yan, Dong Jing-Du, Yan A-Ru, Liu Jian\*, Anomalous microstructure and magnetocaloric properties in off-stoichiometric La-Fe-Si and its hydride, Chin. Phys. B 24, 7(2015) 077503.
27. Zhongtian Zhang, Chun He, Mingxiao Zhang, Jian Liu\*, Influence of extra La and annealing temperature on microstructure and magnetocaloric properties of La-Fe-Co-Si alloys, Physica B 476 (2015)167-170.
28. Jingdu Dong, Mingxiao Zhang, Jian Liu\*, Pengna Zhang, Aru Yan, Magnetic properties and magnetocaloric effect of Hf-Ta-Fe-(Co) alloys, Physica B 476(2015)171-174.
29. J. Liu\*, M.X. Zhang, Y.Y. Shao, A.R. Yan, LaFe<sub>11.6</sub>Si<sub>1.4</sub>/Cu magnetocaloric composites prepared by hot pressing, IEEE Transactions on Magnetics (11) 51(2015)2501502.
30. Mingxiao Zhang, Jian Liu\*, Chun He, Aru Yan, Novel microstructure and large magnetocaloric effect in La<sub>2</sub>Fe<sub>11</sub>Si<sub>2</sub> magnetic refrigerant, Materials Letters 134(2014)87-90.
31. Y.Y. Shao, M.X. Zhang, Y. Zhang, A. R. Yan, J. Liu\*, Effect of annealing on the structure and magnetic entropy change of Mn<sub>1.1</sub>Fe<sub>0.9</sub>P<sub>0.8</sub>Ge<sub>0.2</sub> ribbons, Journal of Magnetism and Magnetic Materials 362(2014)90-92.

#### 授权专利:

1. 张明晓, 刘剑, 张恒, 闫阿儒, 一种稀土—铁—硅基磁制冷复合材料及其制备方法, ZL 201710849594.7
2. 张明晓, 刘剑, 张一飞, 闫阿儒, 孙永阳, 王占洲, 一种镧铁硅基磁制冷材料及其制备方法, ZL 201810827135.3
3. 刘剑, 沈琪, 孙文, 魏志阳, 张明晓, 闫阿儒, 一种具有线性超弹性的Pd-In-Fe类弹热制冷材料的制备方法, ZL 201811164007.1
4. 刘剑, 欧阳亦, 张明晓, 闫阿儒, 一种LaFeSi基磁制冷材料的高通量制备方法, ZL 201811163998.1
5. 刘剑, 张恒, 张明晓, 邵艳艳, 闫阿儒, LaFeSi基磁制冷复合材料及其制备方法与应用, ZL 201510975703.0
6. 邵艳艳, 张明晓, 刘剑, 闫阿儒, 高导热的室温磁制冷内生复合材料、其制备方法及应用, ZL 201510078240.8
7. 刘剑, 何春, 张中天, 张明晓, 闫阿儒, LaFeSi基磁制冷材料及其制备方法, ZL 201510096196.3
8. 张明晓, 刘剑, 一种铁基非晶合金及其制备方法, ZL 201410346147.6

#### 申请专利:

1. 刘剑, 欧阳亦, 王坤, 张明晓, 一种磁热效应高通量表征系统及表征方法, 202010573046.8
2. 王坤, 张明晓, 刘剑, 欧阳亦, 闫阿儒, 一种具有旋转磁热效应的钨钴基磁制冷材料及其制备方法, 201910221946.3

#### 科技奖项:

2020年度宁波市科学技术进步奖三等奖, 强磁弹耦合材料的组织设计和相变制冷, 刘剑, 孙文, 张明晓, 邵艳艳, 赵德伟



中科院宁波材料所磁性材料与器件重点实验室 ? 2007-2013 版权所有 浙江省宁波市镇海区中官西路1219号 邮编: 315201  
联系电话: 0574-86685030