毛博 简历

个人基本情况

- **出生年月：** 1990 年 11 月
- **籍贯：** 湖北省黄冈市
- **民族：** 汉族
- **政治面貌：** 中国共产党
- **工作单位：** 上海交通大学材料科学与工程学院
- **职位：** 副教授、博士生导师
- **联系电话:** +86-15821460286
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教育背景

美国内华达大学里诺分校 2015/08-2020/05

机械工程 博士

导师：Professor Leon Liao and Professor Bin Li

上海交通大学 2011/09-2014/03

材料科学与工程 硕士

导师：孙宝德教授，储双杰教授级高级工程师

华中科技大学 2007/09-2011/06

材料科学与工程 学士

导师：肖建中教授

所获荣誉和奖励

工作时期：

2026 年：上海市技术发明一等奖

2025 年：中国有色工业协会科技进步一等奖

2023 年：小米青年学者

2022 年：国家自然科学基金优秀青年基金（海外）

2021 年：上海市领军人才

学生时期：

2019 年：中国国家优秀自费留学生奖学金

2019 年：美国国家自然科学基金研究生奖学金

2017 年：美国轧辊工业协会奖学金

2015 年：美国内华达大学里诺分校 Differential Fee Fellowship

2014 年：上海交通大学优秀毕业生

研究方向

- **先进结构材料：**钛合金、汽车高强钢
- **金属材料的先进加工技术：**激光冲击强化、高速轧制、超塑性成形等技术
- **金属材料增材制造：**熔体冲击液态金属增材制造，激光冲击固态增材制造
- **金属材料的塑性变形理论：**六方晶系金属的孪晶变形行为，应变诱导相变
- **材料力学性能：**摩擦和磨损，应力腐蚀、材料多尺度力学模拟

工作经历

❖ **美国内华达大学机械工程系**

研究科学家 (Research Scientist) 2020 年 6 月-2021 年 1 月

❖ **上海交通大学材料科学与工程学院**

助理研究员、硕士生导师 2021 年 3 月-2023 年 2 月

❖ **上海交通大学材料科学与工程学院**

副教授、博士生导师 2023 年 3 月-现在

科研项目

主持的科研项目

加入上海交通大学以来**（2021 年 3 月至今），**以**项目负责人身份**主持科研项目合同经费总额超过**2000 万元**，实际到款经费超过**1000 万元**，代表性项目列表如下

❖ 纵向项目（合计金额：516.37 万元）

(1) 国家自然科学基金优秀青年基金（海外）—激光冲击金属固态增材制造，资助金额：200 万元，2023-01-01 至 2025-12-31

(2) 国家自然科学基金青年项目 No. 52101046—基于熔体冲击凝固机制的液态金属增材制造高钒高速钢的显微组织演变机理，资助金额：30 万元，2022-01-01 至 2024-12-31 （已结题）

(3) 国家自然科学基金面上项目 No. 52571089 —TC4 钛合金电子束焊接接头的脉冲磁场辅助激光冲击强化机理研究，资助金额：50 万元，2026-01-01 至 2029-12-31

(4) 工信部 2030 新材料重大专项任务—高强高韧钛合金板材/筒体轧制变形机理和力学性能综合调控，资助金额：128.57 万元，2025-07-01 至 2028-06-30

(5) 科技部国家重点研发计划子课题 2022YFB3705603— 基于钢钛共线的钛合金宽厚板高效短流程制备关键技术研发，资助金额：52 万元，2022-11-01 至 2025-10-31

(6) 科技部国家重点研发计划子课题 2022YFB3705602— 钛合金返回料利用及短流程熔铸关键技术研发，资助金额：52 万元，2022-11-01 至 2025-10-31

❖ **横向项目（合计金额：543.41 万元）**

(7) 宝武特种冶金有限公司企业委托项目—TC4 和 TA10 钛合金的高效热轧机理研究，资助金额：192.55 万元，2022-05-01 至 2024-04-30（已结题）

(8) 宝武特种冶金有限公司企业委托项目— Ti900 钛合金熔铸技术及热加工工艺开发研究，资助金额：190 万元，2024-09-01 至 2026-12-31

(9) 宝武特种冶金有限公司企业委托项目— 海上浮动核电装置壳体用钛合金宽厚板宏量制备技术研究，资助金额：75.8 万元，2023-09-01 至 2024-12-31

(10) 宝山钢铁股份有限公司企业委托项目—原位自生增强复合低密度钢熔铸工艺技术开发，资助金额：45 万元，2024-01-01 至 2024-11-30 （已结题）

(11) 鞍山钢铁股份有限公司企业委托项目—高强钢抗离子辐照机理研究，资助金额：39.96 万元，2025-07-30 至 2027-07-30

❖ **校内项目（合计金额：220 万元）**

(12) 上海交通大学海外高层次人才启动项目—基于熔体冲击凝固机制的液态金属增材制造高钒高速钢的显微组织演变机理，资助金额：200 万元，2024-01-01 至 2026-12-30

(13) 上海交通大学“交大之星”医工交叉项目— 3D 打印多级连通孔洞拓扑结构支架负载 Clec11a 蛋白在软骨损伤治疗中的应用研究，资助金额：20 万元，2022-01-01 至 2024-12-30

❖ **担任主任的联合研究中心（合计金额：1200 万元）**

(14) 宝武碳业-上海交通大学材料学院先进炭材料联合研究中心，资助金额：600 万元，2024-01-01 至 2026-12-30

(15) 宝武特冶-上海交通大学材料学院先进钛合金联合研究中心，资助金额：600 万元，2025-01-01 至 2027-12-30

参与的科研项目

(1) 美国国家自然科学基金(NSF)- CMMI-1635088 Design of Twinning Induced Plasticity (TWIP) Magnesium，资助金额：46.8544 万美元，2016-08-01 至 2020-12-31

(2) 美国国家自然科学基金(NSF)- CMMI-1825739 Nanodiamond Particle Fabrication by Confined Laser Shock Detonation for Drug Delivery and Other Applications，资助金额：22.5 万美元， 2018-08-15 至 2022-7-31

(3) 美国国家自然科学基金(NSF)- CMMI-1826392 Photon-Enabled Atomic Drilling of Graphene for Supercapacitors，资助金额：27.0 万美元， 2018-09-01 至 2022-8-31

(4) 美国国家航空和航天局(NASA)- Development of Structural Metals with Superior Impact Resistance Using Laser Processing for Advanced NASA Applications ，资助金额：5.0 万美元， 2018-10-01 至 2019-6-30

代表性论文和著作

总结:发表学术论文 **50 余**篇，SCI 他引超过 ***1500*** 次, 论文谷歌学术 H 指数为 ***25***

Google 学术主页 ： https://scholar.google.com/citations?user=AOi7lcgAAAAJ&hl=en

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第一作者或通讯作者期刊论文

➢ *博士研究生期间的论文*

(1) **Bo Mao**, Arpith Siddaiah, Pradeep L. Menezes, and Yiliang Liao. "Surface texturing by indirect laser shock surface patterning for manipulated friction coefficient." ***Journal of Materials Processing Technology*** 257 (2018): 227-233. https://doi.org/10.1016/j.jmatprotec.2018.02.041

(2) **Bo Mao**, Yiliang Liao, and Bin Li. "Gradient twinning microstructure generated by laser shock peening in an AZ31B magnesium alloy." ***Applied Surface Science*** 457 (2018): 342-351. https://doi.org/10.1016/j.apsusc.2018.06.176.

(3) **Bo Mao**, Yiliang Liao, and Bin Li. "Abnormal twin-twin interaction in an Mg-3Al-1Zn magnesium alloy processed by laser shock peening." ***Scripta Materialia*** 165 (2019): 89-93. https://doi.org/10.1016/j.scriptamat.2019.02.028.

(4) **Bo Mao**, Arpith Siddaiah, Xing Zhang, Bin Li, Pradeep L. Menezes, and Yiliang Liao. "The influence of surface pre-twinning on the friction and wear performance of an AZ31B Mg alloy." ***Applied Surface Science*** 480 (2019): 998-1007. https://doi.org/10.1016/j.apsusc.2019.03.070.

(5) **Bo Mao**, Bin Li, Dong Lin, and Yiliang Liao. "Enhanced room temperature stretch formability of AZ31B magnesium alloy sheet by laser shock peening." ***Materials Science and Engineering: A*** 756 (2019): 219-225. https://doi.org/10.1016/j.msea.2019.04.054

(6) **Bo Mao** and Yiliang Liao. "Modeling of lüders elongation and work hardening behaviors of ferrite-pearlite dual phase steels under tension." ***Mechanics of Materials*** 129 (2019): 222-229. https://doi.org/10.1016/j.mechmat.2018.11.015

(7) **Bo Mao**, Xing Zhang, Pradeep L. Menezes, and Yiliang Liao. "Anisotropic microstructure evolution of an AZ31B magnesium alloy subjected to dry sliding and its effects on friction and wear performance." ***Materialia*** 8 (2019): 100444. https://doi.org/10.1016/j.mtla.2019.100444.

(8) **Bo Mao**, Arpith Siddaiah, Yiliang Liao, and Pradeep L. Menezes. "Laser Surface Texturing and Related Techniques for Enhancing Tribological Performance of Engineering Materials: A Review." ***Journal of Manufacturing Processes*** 53 (2020) 153:173. https://doi.org/10.1016/j.jmapro.2020.02.009.

(9) **Bo Mao**, Shuangjie Chu, and Shuyang Wang. "Effect of Grain Size on the Friction-Induced Martensitic Transformation and Tribological Properties of 304 Austenite Stainless Steel." ***Metals*** 10 (2020) 9:1246. https://doi.org/10.3390/met10091246.

➢ *加入上海交通大学以后的论文*

(10) 储双杰，**毛博***，胡广魁. "汽车用先进高强度冷轧双相钢的显微组织调控和强韧化机理." ***金属学报*** (2022): 58(4): 551-566. https://doi.org/10.11900/0412.1961.2022.00061

(11) Yujie Wang, Shuangjie Chu, **Bo Mao*,** Hui Xing, Jiao Zhang, and Baode Sun. "Microstructure, residual stress, and mechanical property evolution of a spray-formed vanadium-modified high-speed steel processed by post-heat treatment." ***Journal of Materials Research and Technology*** 18 (2022): 1521-1533. https://doi.org/10.1016/j.jmrt.2022.03.053

(12) Yujie Wang, **Bo Mao*,** Shuangjie Chu, Sai Chen, Hui Xing, Haiyan Zhao, Shuyang Wang, Yuqian Wang, Jiao Zhang, and Baode Sun. " Advanced manufacturing of high-speed steels: a critical review of the process design, microstructural evolution, and engineering performance." ***Journal of Materials Research and Technology*** 2023. https://doi.org/10.1016/j.jmrt.2023.04.269

(13) Yujie Wang, **Bo Mao*,** Shuangjie Chu, Lin He, Yuqian Wang, Hui Xing, Genqi Tian, Haiyan Zhao, Shuyang Wang, Jiao Zhang, and Baode Sun. "Revealing the oxidation mechanism of high vanadium high-speed steel using multi-scale characterization. "***Corrosion Science*** 2023 https://doi.org/10.1016/j.corsci.2023.111592

(14) 张启飞，储双杰，梁高飞，杨帅，王美晨，**毛博***，“EB 态 TA10 钛合金高温变形行为及热加工图”，***中国有色金属学报*** 2023 https://doi.org/10.11817/j.ysxb.1004.0609.2023-44516

(15) 赵海燕，储双杰，张启飞，**毛博***，“锻造工艺对航空用钛合金微观组织演变及力学性能的影响”，***塑性工程学报*** 2024

(16) 王美晨，储双杰，张启飞，赵海燕，**毛博***，“TC4 钛合金热轧过程中的组织演变和性能控制机理研究展望”，***塑性工程学报*** 2024, 31 (9): 1-22 https://doi.org/10.3969/j.issn.1007-2012.2024.09.001

(17) Sai Chen, Shuangjie Chu, and **Bo Mao***. "Iron-based metal matrix composite: a critical review on the microstructural design, fabrication processes, and mechanical properties." ***Acta Metallurgica Sinica (English Letters).*** 38(2024): 1-44. https://doi.org/10.1007/s40195-024-01758-1

(18) Qian Liu, Shuangjie Chu, Xing Zhang, Yuqian Wang, Haiyan Zhao, Bohao Zhou, Hao Wang, Genbin Wu, and **Bo Mao***. "Laser shock processing of titanium alloys: a critical review on the microstructure evolution and enhanced engineering performance." ***Journal of Materials Science & Technology*** (2024) https://doi.org/10.1016/j.jmst.2024.04.075

(19) Wenting Zhu, Shuangjie Chu, and **Bo Mao***. "Synergistic deformation mechanisms with austenite, ferrite and κ-carbide during flow behavior in a ferrite-based lightweight steel. " ***Metallurgical and Materials Transactions A* (2024)**. Volume 55, pages 4159–4174, (2024) https://doi.org/10.1007/s11661-024-07540-3

(20) Qifei Zhang, Shuangjie Chu, Meichen Wang, Gaofei Liang, Haiyan Zhao, and **Bo Mao***. "Interaction of microstructure evolution mechanism in Ti-0.3Mo-0.8Ni alloy with initial lamellar microstructure during isothermal compression below the β-transus." ***Materials Science and Engineering: A*** 916 (2024): 147385. https://doi.org/10.1016/j.msea.2024.147385

(21) Meichen Wang, Shuangjie Chu, Qifei Zhang, Gaofei Liang, Haiyan Zhao, Zhengfang Xu, Yaoping Xu, Xiaolong Zhu, Yaming Shi, and **Bo Mao***. "Study on the evolution patterns of the molten pool and inclusion movement in electron beam cold hearth melting process. " ***Metallurgical and Materials Transactions B*** (2024). https://doi.org/10.1007/s11663-024-03393-8

(22) Shuangjie Chu, Weiwei Huang, Gaofei Liang, Qingtong Meng, Xiangyu Zhou, and **Bo Mao***. "Research Trends in Isothermal Near-Net-Shape Forming Process of High-Performance Titanium Alloys." ***Materials*** 18.3 (2025): 578. https://doi.org/10.3390/ma18030578

(23) Qian Liu, Wanting Sun, Shuangjie Chu, Yuqian Wang, Bohao Zhou, Hao Wang, and **Bo Mao***. "Quasi-in-situ EBSD study of the thermal stability of gradient twinning microstructure of an AZ31B magnesium alloy processed by laser shock peening." ***Materials Characterization*** (2025): 114769. https://doi.org/10.1016/j.matchar.2025.114769

(24) Shuangjie Chu, Qian Liu, Bohao Zhou, Yanhui Wang, Guangkui Hu, and **Bo Mao***. "On the anomalous strain rate dependence of working hardening and fracture behavior of an ultra-high strength 1470 MPa dual phase steel." ***Materials Letters*** (2025): 114769. https://doi.org/10.1016/j.matlet.2025.138172

(25) Xu Wang, Qiang Zhang, Shuangjie Chu, Tong Qin, Qian Liu, Zhengzheng Li, Jun Wang, Jiayu Wan, and **Bo Mao***. "Fe/N Co-Doped Micro-Mesoporous Carbon Nanofibers as High-Performance Catalysts for Zinc-Bromine Flow Batteries." ***Progress in Natural Science: Materials International*** (2025)

(26) **Bo Mao***, Shuangjie Chu, Sai Chen, Xing Zhang, Yuqian Wang, Hui Xing, Genqi Tian, Jiao Zhang, Baode Sun. " On the mechanical behavior of additively manufactured AlSi10Mg processed by post heat treatment: the role of hierarchically heterogeneous microstructure." ***Journal of Alloys and Compounds*** (2025) https://doi.org/10.1016/j.jallcom.2025.182896

(27) Sai Chen, Shuangjie Chu, and **Bo Mao***. "Study on the interfacial structure of in-situ Al2O3 reinforced low-density iron-based metal matrix composite." ***Materials Letters*** (2025): 139493. https://doi.org/10.1016/j.matlet.2025.139493

(28) Qian Liu, Bohao Zhou, Xing Zhang, Yuqian Wang, Wanting Sun, Qifei Zhang, Yafei Wang, Gaofei Liang, Hao Wang, Shuangjie Chu, and **Bo Mao***. " Ultra-high-strain-rate deformation induced HCP-to-FCC phase transformation and its interaction with {11-22} twin in pure Ti." ***Materials Research Letters*** (2025). https://doi.org/10.1080/21663831.2025.2584206

(29) Yafei Wang, Shuangjie Chu, Xing Zhang, Wanting Sun, Qifei Zhang, Qian Liu, Soban Muddassir Dar, Jifeng Sun, Gaofei Liang, Haiyan Zhao, and **Bo Mao***. " In-situ investigation of the slip activities, deformation twinning, and cracking behavior of a bimodal Ti-6Al-3Nb-2Zr-1Mo alloy. "***Materials Science and Engineering: A*** (2025). https://doi.org/10.1016/j.msea.2025.149705

(30) Meichen Wang, Shuangjie Chu, Qifei Zhang, Gaofei Liang, Haiyan Zhao, Xinhua Min, Qingtong Meng, and **Bo Mao***. " Three-dimensional simulation and experimental validation of solidification behavior in large-scale vacuum arc remelted Ti-6Al-4V alloy ingots. " ***Metallurgical and Materials Transactions B*** (2026). https://doi.org/ 10.1007/s11663-026-03956-x

(31) Yafei Wang, Shuangjie Chu, Xing Zhang, Wanting Sun, Wei Sun, Qian Liu, Bohao Zhou, Sai Chen, Gaofei Liang, Haiyao Zhao, and **Bo Mao***. " States-of-the-arts of dynamic recrystallization behavior of Ti alloys and its implications on the thermo-mechanical processing: a critical review. " ***Review of Materials Research*** (2026). https://doi.org/ 10.1007/s11663-026-03956-x

(32) Qian Liu, Xing Zhang, Shuangjie Chu, Jiayi Huang, Bohao Zhou and **Bo Mao***. " Nanotwin-armored microtextured CP-Ti surfaces enabled by ultrahigh-strain-rate laser shock surface patterning for enhanced tribo-bio functionality. " ***Tribology International*** (2026). https://doi.org/ 10.1007/s11663-026-03956-x

(33) Sai Chen, Shuangjie Chu, Chuanhua Lin, and **Bo Mao***. "Hierarchical regulation of dynamic recrystallization in low-density iron-based composites by multiscale in-situ reinforcements during thermomechanical processing. " ***Materials & Design*** (2026). https://doi.org/10.1016/j.matdes.2026.115876

(34) Bohao Zhou, Qian Liu, Shuangjie Chu, Yafei Wang, Weiwei Huang, and **Bo Mao***. "Oxygen-mediated deformation mode and its impact on dynamic recrystallization in thermo-mechanical processing of titanium." ***Journal of Alloys and Compounds*** (2026).

非第一作者或通讯作者期刊论文

➢ *博士研究生期间的论文*

(35) Arpith Siddaiah, **Bo Mao**, Yiliang Liao, and Pradeep L. Menezes. "Surface characterization and tribological performance of laser shock peened steel surfaces." ***Surface and Coatings Technology*** 351 (2018): 188-197. https://doi.org/10.1016/j.surfcoat.2018.07.087.

(36) Xing Zhang, Christopher J. Yocom, **Bo Mao**, and Yiliang Liao. "Microstructure evolution during selective laser melting of metallic materials: A review." ***Journal of Laser Applications*** 31, no. 3 (2019): 031201. https://doi.org/10.2351/1.5085206.

(37) Xing Zhang, **Bo Mao**, Arpith Siddaiah, Pradeep L. Menezes, and Yiliang Liao. "Direct laser shock surface patterning of an AZ31B magnesium alloy: Microstructure evolution and friction performance." ***Journal of Materials Processing Technology*** 275 (2020): 116333. https://doi.org/10.1016/j.jmatprotec.2019.116333.

(38) Arpith Siddaiah, **Bo Mao**, Yiliang Liao, and Pradeep L. Menezes. "Effect of Laser Shock Peening on the Wear–Corrosion Synergistic Behavior of an AZ31B Magnesium Alloy." ***Journal of Tribology*** 142, no. 4 (2020). https://doi.org/10.1115/1.4045500.

(39) Xing Zhang, **Bo Mao**, Yiliang Liao, and Yufeng Zheng. "Selective laser melting of graphene oxide–reinforced Ti–48Al–2Cr–2Nb: Improved manufacturability and mechanical strength." ***Journal of Materials Research*** 35.15 (2020): 1998-2005. http://doi.org/10.1557/jmr.2020.63

(40) Arpith Siddaiah, **Bo Mao**, Kasar K. Ashish, Yiliang Liao, and Pradeep L. Menezes. "Influence of laser shock peening on the surface energy and tribocorrosion properties of an AZ31B Mg alloy." ***Wear*** 462 (2020): 203490. https://doi.org/10.1016/j.wear.2020.203490.

(41) Yipeng Gao, Jia-Hong Ke, **Bo Mao**, Yiliang Liao, Yufeng Zheng, and Larry K. Aagesen. "Twinning path determined by broken symmetry: A revisit to deformation twinning in hexagonal close-packed titanium and zirconium." ***Physical Review Materials***. 4, no. 7 (2020): 070601. https://doi.org/10.1103/PhysRevMaterials.4.070601

➢ *加入上海交通大学以后的论文*

(42) Xing Zhang, **Bo Mao**, Leslie Mushongera, Julia Kundin, and Yiliang Liao. "Laser powder bed fusion of titanium aluminides: An investigation on site-specific microstructure evolution mechanism." ***Materials & Design*** 201 (2021): 109501. https://doi.org/10.1016/j.matdes.2021.109501

(43) Xing Zhang, Haofan Sun, **Bo Mao**, Rui Dai, Houlong Zhuang, Yiliang Liao, and Qiong Nian. "Nanosecond laser shock detonation of nanodiamonds: from laser-matter interaction to graphite-to-diamond phase transition." ***International Journal of Extreme Manufacturing*** 4, no. 1 (2021): 015401. https://doi.org/10.1088/2631-7990/ac37f1

(44) Genqi Tian, **Bo Mao**, Yuantao Xu, Liming Fu, Zuogui Zhang, Yanfeng Wang, and Aidang Shan. "Investigation on gradual degradation of mechanical property and microstructure in 9% Cr heat-resistant steels via interrupted creep test." ***Journal of Materials Science*** (2023): https://doi.org/1-20.s10853-023-08296-8

(45) Fazlay Rubbi, Xing Zhang, Fatemeh Delzendehrooy, **Bo Mao**, Qiong Nian, Charalabos C. Doumanidis, and Yiliang Liao. "Chemical etching enhanced nanosecond pulsed laser micromachining: An experimental and numerical investigation." ***Journal of Manufacturing Processes*** 108 (2023): 384-394. https://doi.org/10.1016/j.jmapro.2023.11.017

(46) Alessandro Ralls, **Bo Mao**, and Pradeep Menezes. "Tribological Performance of Laser Shock Peened Cold Spray Additive Manufactured 316L Stainless Steel." ***Journal of Tribology*** (2023): 1-28. https://doi.org/10.1115/1.4062102

(47) Ya Zhang, Yue Wu, Yang Tang, Jianbo Ma, **Bo Mao**, Yanling Xue, Hui Xing, Jiao Zhang, and Baode Sun. "In situ study on the oscillation of mobile droplets and force analysis during the directional solidification of Al-Bi alloy." ***Journal of Materials Science & Technology*** 177 (2024): 1-9. https://doi.org/10.1016/j.jmst.2023.06.059

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(51) Shuangjie Chu, Wenting Zhu, **Bo Mao**, and Guangkui Hu. "High strain rate deformation behavior of QP1180 advanced high-strength steel for automobiles." ***Materials Science and Engineering: A*** (2024): 147735. https://doi.org/10.1016/j.msea.2024.147735

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(53) Yicheng Wang, Qihang Hu, Zhihong Yao, Bo Mao, Gangxian Zhu, Jiaqiang Li, and Xing Zhang. "Engineering heterostructures via layer-wise in-situ alloying in additive manufacturing: Compositional and architectural design in heterogeneous 316 L stainless steel for strength-ductility synergy." ***Journal of Materials Processing Technology*** (2025): 118998. https://doi.org/10.1016/j.jmatprotec.2025.118998

会议论文

(54) **Bo Mao** and Yiliang Liao. "Understanding the Laser-Matter Interaction and Plasma Dynamics in Nanosecond Pulsed Laser Shock Processing: A First Principle Study." ***In ASME 2019 14th International Manufacturing Science and Engineering Conference. American Society of Mechanical Engineers Digital Collection.*** https://doi.org/10.1115/MSEC2019-2848.

(55) **Bo Mao**, Yiliang Liao, and Bin Li. "Twinning Behavior in Magnesium Alloys Processed by Laser Shock Peening." ***In ASME 2019 14th International Manufacturing Science and Engineering Conference. American Society of Mechanical Engineers Digital Collection***. https://doi.org/10.1115/MSEC2019-2850.

(56) **Bo Mao**, Arpith Siddaiah, Pradeep L. Menezes, and Yiliang Liao. "A Novel Laser Shock Surface Patterning Process Toward Tribological Applications." ***In ASME 2019 14th International Manufacturing Science and Engineering Conference. American Society of Mechanical Engineers Digital Collection.*** https://doi.org/10.1115/MSEC2019-2849.

(57) **Bo Mao**, Xing Zhang, Yiliang Liao, and Bin Li. "Improving Room Temperature-Stretch Formability of Magnesium Alloys by Laser Shock Peening." ***In ASME 2019 14th International Manufacturing Science and Engineering Conference. American Society of Mechanical Engineers Digital Collection.*** https://doi.org/10.1115/MSEC2019-2910.

(58) Xing Zhang, **Bo Mao**, Rebecca Histed, and Yiliang Liao. "Modeling for Chemical-Etching Enhanced Pulsed Laser Ablation." ***In ASME 2019 14th International Manufacturing Science and Engineering Conference. American Society of Mechanical Engineers Digital Collection.*** https://doi.org/10.1115/MSEC2019-2844

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授权和公开的发明专利

钛合金方向

- **本人作为第一发明人：**

(1) **毛博**，高振葵，储双杰，王亚飞，周博皓，刘倩；一种基于有限元模拟的双相钛合金热加工变形预测方法；授权，ZL202511042089.2；专利申请日：2025.07.28；专利授权日：2025.09.19.

(2) **毛博**，王亚飞，储双杰，刘倩，周博皓；基于机器学习的钛合金动态再结晶组织形态的分析方法、系统及介质；授权，ZL202511041808.9；专利申请日：2025.07.28；专利授权日：2025.09.19.

(3) **毛博**，周博皓，储双杰，刘倩，王亚飞，；一种基于深度学习的钛合金显微组织识别方法、系统及介质；授权，ZL202511066517.5；专利申请日：2025.07.31；专利授权日：2025.09.26.

(4) **毛博**，王亚飞，储双杰，刘倩，张启飞；一种利用感应加热抑制钛合金热轧过程中 C 翘的方法；公开号：CN120460497A；专利申请日：2025.05.15；专利公开日：2025.08.12.

(5) **毛博**，王亚飞，储双杰，梁高飞，肖桂林，赵海燕，张启飞，孙继锋；一种抑制钛合金轧制过程产生边部裂纹的轧制方法；公开号：CN120286497A；专利申请日：2025.03.17；专利公开日：2025.07.11.

(6) **毛博**，王亚飞，刘倩，储双杰，黄巍巍；一种钛合金新能源电池壳热冲压成形方法及其产品与应用；申请号：CN202511726625.0；专利申请日：2025.11.24；专利公开日：2025.12.23.

(7) **毛博**，王美晨，储双杰，牛辰睿，黄巍巍，刘倩，王亚飞，周博皓，孙玮；一种电子束冷床炉熔炼中夹杂物的迁移分布分析方法、存储介质及设备；申请号：CN202610064247.2；专利申请日：2026.01.19；专利公开日：2026.02.17.

(8) **毛博**，王美晨，储双杰，牛辰睿；一种真空自耗电弧熔炼过程铸锭的多尺度模拟方法，预审通过，申请号：202610296897.X

(9) **毛博**，黄巍巍，储双杰，孙玮，周博皓，刘倩，王美晨，王亚飞；一种钛合金超塑成形的优化方法、系统及存储介质；申请号：CN202511914622.X；专利申请日：2025.12.18；专利，公开日：2026.01.16.

(10) **毛博**，周博皓，储双杰，黄巍巍，刘倩，王亚飞；一种高损伤容限的高氧钛合金及其制备方法；申请号：CN202610043933.1；专利申请日：2026.01.14；专利公开日：2026.02.13.

(11) **毛博**，孙玮，储双杰，刘倩，王亚飞，周博皓，黄巍巍；一种钛合金轧制过程的工艺参数动态优化调节系统；授权 ZL202610031699.0；专利申请日：2026.01.12；专利授权日：2026.03.13.

(12) **毛博**，孙玮，储双杰，周博皓，王亚飞，刘倩，王美晨，黄巍巍；一种基于条件生成对抗网络的钛合金显微组织预测方法、系统及存储介质；申请号：CN202511903291.X；申请日：2025.12.17；专利公开日：2026.01.13.

(13) **毛博**，牛辰睿，一种大规格钛合金 VAR 锭的合金元素偏析预测方法，1 月 12 日提交预审

(14) **毛博**，刘倩，王亚飞，储双杰，周博皓；一种利用激光冲击强化提升焊接接头耐应力腐蚀性的方法；申请号：CN202511701148.2；申请日：2025.11.19；专利公开日：2026.02.13.

(15) **毛博**，高振葵，储双杰，王亚飞，周博皓，刘倩，孙玮；一种适于高表面质量钛合金薄板的冷轧轧辊处理方法；授权 ZL202610064015.7；专利申请日：2026.01.19；专利授权日 2026.03.18.

(16) **毛博**，陈赛，储双杰；一种钛合金锻造过程中在线取样检测系统及方法；申请号：CN202511365583.2；专利申请日：2025.09.23；专利公开日：2025.12.12.

- **企业代表作为第一发明人：**

(17) 储双杰，**毛博**，王亚飞，梁高飞，孙继峰，赵海燕，张启飞，肖桂林；一种基于异步热轧工艺抑制钛合金板材 C 型翘曲的制备方法；授权 ZL202511317636.3；专利申请日：2025.09.16；专利授权日：2025.12.16.

(18) 储双杰，**毛博**，王美晨，梁高飞，赵海燕，许正芳，史亚鸣；采用 TC4 合金 EB 锭制备极薄带材的方法；授权 ZL202310784383.5；专利申请日：2023.06.29；专利授权日：2025.11.21.

(19) 储双杰，**毛博**，王美晨，闵新华，孟庆通，梁高飞，计波；一种钛合金真空冶炼铸锭零缩孔的热封顶工艺优化方法，

(20) 储双杰，**毛博**，陆琪，黄巍巍，孟庆通，梁高飞；一种精确控制航空发动机钛合金机匣的超塑成形方法；授权 ZL，202511262498.3；专利申请日：2025.09.05；专利授权日 2025.11.18；

(21) 储双杰，**毛博**，黄巍巍，孟庆通，梁高飞，计波；一种 TC4 钛合金超塑性成形过程中的尺寸精度和表面质量控制方法；公开 CN120901198A；专利申请日：2025.07.31；专利公开日：2025.11.07.

(22) 储双杰，张启飞，**毛博**，史亚鸣，刘昆，梁高飞，赵海燕，王美晨，许正芳；一种采用 TA10 钛合金 EB 锭制备细匀等轴组织板材的方法；授权 ZL202310925787.1；专利申请日：2023.07.26；专利授权日：2025.08.12.

(23) 储双杰，孟庆通，黄巍巍，周翔宇，梁高飞，李哲，**毛博**；一种 TC4 钛合金航空发动机整体叶盘的等温近净成形方法；授权 ZL202411783664.X；专利申请日：2024.12.06；专利授权日：2025.05.02.

(24) 储双杰，黄巍巍，朱峰，孟庆通，**毛博**，李艳影，杜子木，梁高飞；一种大型航空发动机风扇整体叶盘用大规格 TC4 钛合金棒材及其制备方法；授权 ZL202411783663.5；专利申请日：2024.12.06；专利授权日：2025.05.02.

(25) 储双杰，黄巍巍，孟庆通，周翔宇，梁高飞，朱峰，李艳影，**毛博**；一种高效短流程 TC4 钛合金风扇整体叶盘锻件超塑成形方法；授权 ZL202411783666.9；专利申请日：2024.12.06；专利授权日：2025.05.02.

(26) 储双杰，史亚鸣，姜浩，**毛博**，张启飞，肖桂林，刘昆，张晓锋；一种超大规格尺寸钛合金宽厚板热处理方法；公开号 CN118291901A；专利申请日：2024.04.25；专利公开日：2024.07.05.

(27) 储双杰，计波，赵海燕，史亚鸣，梁高飞，许正芳，**毛博**，王美晨；一种 TC4 钛合金宽厚板及其制备方法；授权 ZL202310946266.4；专利申请日：2023.07.31；专利授权日：2025.12.16.

(28) 储双杰，姜浩，刘昆，梁高飞，尹正培，史亚鸣，肖永江，**毛博**；一种 TC4 钛合金块状返回料的电子束冷床炉熔炼扁锭工艺;公开号 CN118109696A；专利申请日：2024.02.20；专利 公开日：2024.05.31.

(29) 储双杰，张启飞，**毛博**，史亚鸣，刘昆，梁高飞，赵海燕，王美晨，许正芳；两相钛合金板材热处理时富氧 α 层厚度的预测方法；公开号 CN118033078A；专利申请日：2024.02.01；专利公开日：2024.05.14.

(30) 储双杰，张启飞，**毛博**，史亚鸣，刘昆，梁高飞，赵海燕，王美晨，许正芳；准原位监控两相钛合金轧制时组织演变的方法；授权 ZL202311407195.7；专利申请日：2023.10.27；专利授权日：2025.10.14.

(31) 储双杰，王美晨，梁高飞，**毛博**，张启飞，赵海燕，涂德芳，许正芳，孙继锋；一种低成本高强度的两相钛合金及其制造方法；公开号 CN120174232A；专利申请日：2025.05.13；专利，公开日：2025.08.29.

激光冲击和增材制造方向

(32) **毛博**，刘倩，储双杰，王亚飞；一种基于激光冲击的增材方法；公开号：ZL202411931771.2；专利申请日：2024.12.26；专利授权日：2025.12.26.

(33) **毛博**，刘倩，储双杰，王亚飞；具有梯度纳米孪晶的钛材料及其制备方法；公开号：CN119876808A；专利申请日：2025.01.20；专利公开日：2025.04.25.

(34) **毛博**，刘倩，储双杰，王亚飞；一种基于激光冲击的表面处理方法；公开号：CN119824211A；专利申请日：2025.01.07；专利公开日：2025.04.15.

(35) **毛博**，周博皓，储双杰，刘倩；基于激光冲击强化的高强度无取向硅钢及制备方法和应用；公开号：CN120683348A；专利申请日：2025.07.31；专利公开日：2025.09.23.

(36) 刘倩，**毛博**，周博皓，储双杰，王亚飞；利用高温冲击变形诱导 FCC 相提升钛合金强韧性匹配的方法；公开号：CN120719236A；专利申请日：2025.07.11；专利公开日：2025.09.30.

钢铁材料方向

(37) **毛博**，王玉杰，张佼，孙宝德，东青，邢辉；一种低碳低合金钢的制造装置及方法；中国发明专利；授权 ZL202210365805.0；申请日：2022.04.07；专利授权日：2023.04.04.

(38) 王玉杰，**毛博**，张佼，孙宝德，东青，杨江波，一种细化高碳高合金钢碳化物的方法；中国发明专利；授权 ZL202210485310.1；专利申请日：2022.05.06；专利授权日：2023.05.09.

(39) 王玉杰，**毛博**，张佼，东青，孙宝德，姜海涛，孙志龙；一种成分梯度变化的合金复合层及其制备方法；中国发明专利授权 ZL202210364403.9；专利申请日：2022.04.07；专利授权日：2024.01.19.

(40) 王玉杰，**毛博**，张佼，姜海涛，东青，孙宝德；一种高熔点合金液流喷射式制造装置，实用新型；授权 ZL202321366789.3；专利申请日：2023.05.31；专利授权日：公告日：2023.11.10.

(41) 王玉杰，**毛博**，张佼，姜海涛，东青，孙宝德；一种高碳合金钢中 MC 碳化物的测定方法，CN116577330A；专利申请日：2023.05.26；专利公开日：2023.08.11.

(42) 王玉杰，**毛博**，张佼，东青，孙宝德，姜海涛，孙志龙；一种成分梯度变化的合金复合层及其制备方法；中国发明专利授权 ZL202210364403.9；专利申请日：2022.04.07；专利授权日：2022.07.22

(43) 王玉杰，**毛博**，张佼，东青，孙宝德，孙志龙；一种喷射机构和异质渐变层制造装备；中国新型实用专利，授权 ZL202220839550.2；专利申请日：2022.04.07；专利授权日：2022.07.26.

(44) 储双杰，朱雯婷，**毛博**，陈赛，胡广魁，林传华；黄才根；一种 Fe-Al 系高强高塑铁素体低密度钢及其制备方法；公开号：CN118326278A；专利申请日：2023.11.29；专利公开日：2024.07.12.

(45) 储双杰，陈赛，**毛博**，朱雯婷，胡广魁，林传华，黄才根；原位自生 Al_2O_3 增强的低密度钢基复合材料及其制备方法；公开号：CN119571201A；专利申请日：2024.11.11； 专利公开日：2025.03.07.

(46) 储双杰，陈赛，**毛博**，朱雯婷，胡广魁，林传华，黄才根；原位自生 Al_2O_3 增强的低密度铁基复合材料及其制备方法； 公开号：CN119571202A；专利申请日：2024.11.11；专利公开日：2025.03.07.

(47) Yujie Wang，**Bo Mao**，Jiao Zhang，Baode Sun，etal.，Carbide refining method of high-carbon high-alloy steel，International，Application，No.PCT/CN2023/104782；International Filing Date: June 30, 2023；International Publication Date: November 9, 2023.

教学工作

在美国内华达大学里诺分校独立承担教学的课程

(1) 研究生课程 ME 532 Advanced Manufacturing, 2020 年春季，独立承担 32 个学时的教学任务

在美国内华达大学里诺分校担任助教的课程

(1) 本科生课程 ME 310 System Analysis and Design, 2015 年秋季，2016 年春季

(2) 本科生课程 ME 491 Advanced Mechanics, 2015 年秋季

(3) 本科生课程 ME 354 Introduction to Manufacturing, 2017 年秋季，2018 年秋季，2019 年夏季

在中国上海交通大学教授的课程

(1) 研究生课程 MSE8611 现代材料表面工程与技术，2024 年、2025 年秋季，32 学时。

上海交通大学材料学院**第一门**全英文校企合作双一流课程

学生指导情况

在美国内华达大学担任研究科学家期间协助指导的**学生：**

(1) Alessandro M. Ralls, Ph.D. student，毕业去向：***Senior Engineer at Blue Origin Enterprises***

(2) Md Hafizur Rahman, Ph.D. student，毕业去向：***Assistant Professor at Illinois State University***

(3) Rebecca Histed, M.S. student，毕业去向：***Senior Engineer at Panasonic Energy Corporation of North America***

(4) Zachary Premack, Undergraduate student，毕业去向：以色列国陆军战士

在上海交通大学担任博士生导师期间指导的**学生**：

(1) 刘倩（2023 级博士研究生）

(2) 王亚飞（2024 级博士研究生）

(3) 孙玮（2025 级博士研究生）

(4) 周春桃（2026 级博士研究生）

(5) 高振葵（2024 级硕士研究生）

(6) 邵云静（2025 级硕士研究生）

(7) 黄嘉懿（2021 级本科生），毕业去向：美国霍普金斯大学攻读研究生

(8) 洪志远（2021 级本科生），毕业去向：上海交通大学攻读研究生

在上海交通大学协助指导的**学生**：

(9) 陈赛（2021 级博士研究生）

(10) 王美晨（2022 级博士研究生）

(11) 周博皓（2023 级博士研究生）

(12) 黄巍巍（2024 级博士研究生）

(13) 洪志远（2025 级博士研究生）

在上海交通大学合作的**博士后研究员**：

(1) Soban Muddassir（东南大学博士，2024 年 12 月入站-）

(2) 丁一凡（中国科学院物理研究所博士，2025 年 9 月入站-）

(3) 朱雯婷（东北大学博士，2022 年 10 月-2024 年 10 月在站学习），出站去向：天津科技大学机械学院讲师

(4) 张启飞（燕山大学博士，2023 年 2 月-2025 年 3 月在站学习），出站去向：宝武特冶钛金主任研究员

(5) 张强（中国科学院大学博士，2023 年 9 月-2025 年 9 月在站学习），出站去向：中北大学副教授

国际学术会议报告

总结:作为报告人，在北美制造科学与工程年会 (NAMRI/SME)，材料科学与技术年会 (MS&T)，以及国际航空材料大会 (AeroMat)等国际会议上一共作报告 ***15*** 次：

(1) **Mao B**, Liao Y. Modeling of the Flow Behavior of Dual Phase Steels. 2017 ***Institute Roll Design Association Annual Conference***. Reno, NV, 2017. **(大会特邀报告)**

(2) **Mao B**, Siddaiah A, Menezes PL, Liao. A Novel Laser Shock Surface Patterning Process towards Tribology Applications. ***2018 Materials Science and Technology Conference & Exhibition***. Columbus, OH, 2018.

(3) **Mao B**, Liao Y, Li B. Laser Shock Processing of AZ31B Magnesium Alloy: The Generation of Gradient Twinning Microstructure. ***2018 Materials Science and Technology Conference & Exhibition***. Columbus, OH, 2018.

(4) **Mao B**, Liao Y, Modeling of Lüders Elongation and Work Hardening Behaviors of Ferrite-Pearlite Dual Phase Steels under tension. ***AeroMat 30th Conference and Exposition***. Reno, NV, 2019.

(5) **Mao B**, Li B, Liao Y. Enhanced Room Temperature Stretch Formability of AZ31B Magnesium Alloy Sheet by Laser Shock Peening. ***AeroMat 30th Conference and Exposition***. Reno, NV, 2019.

(6) **Mao B**, Liao Y, Li B. Twinning Behavior in Magnesium Alloys Processed by Laser Shock Peening. ***AeroMat 30th Conference and Exposition***. Reno, NV, 2019.

(7) **Mao B**, Siddaiah A, Menezes PL, Liao. A Novel Laser Shock Surface Patterning Process toward Tribological Applications. ***AeroMat 30th Conference and Exposition***. Reno, NV, 2019.

(8) **Mao B**, Liao Y. Understanding the Laser-Matter Interaction and Plasma Dynamics in Nanosecond Pulsed Laser Shock Processing: A First Principle Study. ***14th International Manufacturing Science & Engineering Conference***. Erie, PA, USA. 2019.

(9) **Mao B**, Siddaiah A, Menezes PL, Liao. A Novel Laser Shock Surface Patterning Process Toward Tribological Applications. ***14th International Manufacturing Science & Engineering Conference***. Erie, PA, USA. 2019.

(10) **Mao B**, Liao Y, Li B. Twinning Behavior in Magnesium Alloys Processed by Laser Shock Peening. ***14th International Manufacturing Science & Engineering Conference***. Erie, PA, USA. 2019.

(11) **Mao B**, Li B, Liao Y. Improving Room Temperature-Stretch Formability of Magnesium Alloys by Laser Shock Peening. ***14th International Manufacturing Science & Engineering Conference***. Erie, PA, USA. 2019

(12) **Mao B**, Li B, Liao Y. Ultra-high Strain Rate Processing of Magnesium Alloys: Microstructure Evolution and Enhanced Mechanical Properties. ***2019 Materials Science and Technology Conference & Exhibition.*** Portland, OR, USA. 2019.

(13) **Mao B**, Siddaiah A, Zhang X, Menezes PL, Liao. Improving the Tribological Performance of Magnesium Alloys by Laser Shock Peening. ***2019 Materials Science and Technology Conference & Exhibition***. Portland, OR, USA. 2019

(14) **Mao B**, Shuangjie Chu, Qian Liu, and Qifei Zhang. Laser shock processing of titanium alloys: microstructure evolution and enhanced engineering performance. ***2024 Materials Science and Technology Conference & Exhibition***. Pittsburgh, PA, USA. 2024

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- 中国材料研究学会钛合金分会第一届理事会 **理事**
- 国家自然科学基金委员会青年、面上项目 **评审专家**
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- 中国激光加工学会 **会员**
- 担任 30 余个 SCI 期刊的**审稿人**，包括：
  - Proceedings of the National Academy of Sciences
  - Acta Materialia
  - International Journal of Plasticity
  - Scripta Materialia
  - Materials Research Letters

- Journal of Materials Science & Technology
- International Journal of Extreme Manufacturing
- Journal of Manufacturing Processes
- Material Science and Engineering: A
- Materials Characterization
- Advanced Engineering Materials