简　　历

个人概况：

姓名：	朱强	性别：	男
出生年月：	1960 年 3 月	籍贯：	辽宁省抚顺市
毕业院校：	德国爱尔兰根-纽伦堡大学	学位：	工学博士（Dr.-Ing.）
专业：	材料科学与工程	联系电话：	13811482782
现在单位：	北京有色金属研究总院	现任职位：	首席专家（全院 4 位）
	北京市金属先进成形制造工程技术中心	现任职务：	主任

教育背景：

1990 - 1994	德国爱尔兰根-纽伦堡大学（University of Erlangen-Nuremberg	材料科学与工程 Materials Sci&Eng	工学博士 Dr.-Ing.）
1982 - 1986	北京钢铁学院（现北京科技大学）	高温合金学	硕士
1978 - 1982	北京钢铁学院（现北京科技大学）	高温合金学	学士

工作经历：

2010 – 今： 北京有色金属研究总院， 副总工程师后转为首席专家
国家金属基复合材料工程技术研究中心，副主任
北京市金属先进成形制造工程技术中心，首任主任（2014 年起）

教学：2012-2015 年 4 次（4x40 学时）研究生课程“金属材料构件的失效分析及其应用”。指导博士后 1 名、博士生 11 名和硕士 2 名。

科研：金属材料的控制凝固理论研究和成形技术研发。重点是通过温度场和成分场控制理论和技术研究，发现得到细小和球状晶粒颗粒组织的内在规律，实现组织的控制，为后续半固态、金属粉末注射成形以及 3D 打印成形技术的实现创造组织保障。研究颗粒组织材料在成形过程中的多相流动内在规律，发展多相流模型和计算机模拟技术，优化成形工艺，实现半固态、金属粉末注射成形以及 3D 打印技术。

管理：有研总院怀柔院（中央研究院）运行体系研究和设置；总院与英国等国际合作；先进成形领域规划、技术开发指导和市场孵化等；国家工程中心研究生教育和员工培训等。全面负责北京市金属先进成形工程技术研究中心的运营和管理。

主要业绩：1、组建了先进控制成形团队（目前近 40 人包括高端外国专家 1 人、外国教授兼职博导 1 人以及博士、硕士、技术工人和研究学生）；2、获批“北京市金属先进成形制造工程技术研究中心”；3、完成国家“863”、科技支撑和国际合作以及国家软科学研究计划项目“国内外产业技术研发组织模式比较研究”课题研究（纵向经费 1842 万元、企业研发及技术服务 505 万元，技术转让 800 万元）；4、发表文章 45 篇、专利 24 项；5、成功举办 5 届国际半固态技术研讨会，2016 年第五届研讨会有 200 余位代表参加；6、在我们的推动下，半固态成形技术已被列为国家十三五重大基础材料研发项目之一。

2014 - 今: 北京市金属先进成形制造工程技术研究中心，主任
组建和发展了半固态成形、激光增材制造、特种铸造、金属粉末注射成型、计算机模拟和辅助设计以及失效分析六个领域。

2003 – 2010： Cummins Turbo Technologies Ltd (英国)， 首席冶金与材料工程师
全球涡轮增压器材料的选择和零部件制备技术的研发。带领研发团队先后成功研发涡轮制备工艺和压叶轮铝合金锻造工艺及半固态压铸工艺，为公司节省数十亿美元和提高产品寿命近 10 倍，先后代表涡轮增压技术分公司向总公司 president 和 CEO 汇报。先后于 2004 年和 2006 年两次获得公司唯一的 Steve Power 科技进步奖和 2009 年北美半固态/挤压铸造科技进步大奖。半固态压叶轮技术受邀在国际上最权威的两年一次的国际半固态大会上作大会（2010）特邀报告（Invited Key Note Lecture）。

1995 – 2003: University of Sheffield and University of Cambridge (英国), 研究员
金属材料热变形行为和组织变化研究。重点研究了基于热变形过程中温度场和形变场不均匀性及其对组织变化的影响进行在线监测和控制技术。温度场、应变场及金属和模具交互作用产生

的不均匀性产生耦合作用，会对金属变形过程中的位错以及随后的恢复与再结晶行为产生影响，从而影响产品的品质。结合自动控制、机械工程及冶金材料技术多学科交叉，全球首次发展了“Hybrid Modelling”并成功应用于热加工过程的在线监测和控制。成果在金属材料领域最高水平 Acta Mat 上发表，被评价为“为热加工过程模拟和控制提供了一个崭新的技术”。研究成果受邀在加拿大铝业和德国西门子公司以及爱尔兰根大学等进行学术交流。发表论文近 40 篇，在国际铝合金最具影响力的第七届国际铝合金、2002 国际冶金学家年会和第六届国际材料等大会上作特邀报告。

1990 – 1995： University of Erlangen-Nuremberg（德国），研究助理
进行铝合金蠕变和热变形研究。提出铝合金可分为两种共性热变形行为：Class M 和 Class A。这两种合金类型在热加工的开始阶段和大变形量阶段分别具有其独特的特性。这种特性由其内在的位错运动形式和亚组织形态所决定。根据位错的本质特征，建立物理方程（Composite Model），进行计算机模拟，得到了广泛的关注和应用，分别受邀在加拿大 Concordia 大学和意大利 Ancona 大学做学术报告和交流。

1989 – 1990： Ecole des Mine de Nancy (法国)， 客座研究员
进行镍基高温合金定向凝固过程中合金元素 Cr、Al、Ti 等和微量元素 Mg 的偏析与分布规律，首次揭示了镁对碳化物的球化机制，为高温合金持久寿命的提高提供了理论依据。

1982 – 1989： 北京科技大学，学生辅导员，讲师，高温合金实验室主任
专注于高温合金的冶炼、铸造、热变形及热处理理论和技术研究，是深入研究微量元素镁对高温合金蠕变行为作用机理的开创者，先后获得中国金属学会最佳论文奖和国家发明专利。进行了我国首批炼油厂燃气轮机涡轮盘高温合金材料和热成形技术的研制的相关工作。

社会兼职：

- “千人计划”工程与材料专业委员会材料组组长。
- 国家科技部十二五重点专项《高品质特殊钢及高温合金》总体专家组专家。
- 人才、科研项目和科技奖项评审专家（或组长）：国家“千人计划”创新（企业）、创业、青年和外专计划评审专家（2015 年外专千人评审巡视组组长）。广东外专、深圳“孔雀计划”、人社部留学人员创新创业项目、浙江“千人”、江苏省高层次创新创业人才项目、福建省高层次人才项目以及绍兴、宁波等地方人才项目。科技部科技项目、自然基金、科技进步奖等评审专家。国务院学位委员会博士论文质量审查专家等。
- 1999 年获中国国家教育部参加庆祝中华人民共和国成立五十周年与祖国同庆-海外优秀留学人员春晖计划回国报效系列活动证书，受邀参加 50 周年国庆观礼。2009 年回国参加 60 周年国庆观礼活动，受邀参加国庆招待会。
- 曾先后受到江泽民、胡锦涛、温家宝、习近平、李克强等国家领导人接见。
- 数十次担任学术会议组委会或学术委员会成员或主席。近期有：Co-Organizer of 14th Intern Conf on Semi Solid Processing of Alloys and Composites(Oct 2016, USA), Session Chair of Aluminum at MS$T 2016（Oct 2016, USA）, Member of Organizing Committee of High Tech Die Casting 2016 (June 2016, Italy)，Co-Organizer of 4th Intern Symp on Frontier in Materials Sciences and Engineering (July 2016, UK)，“中国制造 2025 系列-高端制造与新材料”大会主席（2016 年 9 月沈阳），“千人计划”2016 材料年会主席（2016 年 10 月，杭州）等。
- 《稀有金属》、 《Rare Metals》杂志编委

获奖情况：

- Journal of Alloys and Compounds 649(2015) 204-210 文章“Microstructural evolution and thixoformability of semi-solid aluminum 319s alloy during re-melting”被 Advances in Engineering （AIE）评选为“对科学与工程有卓越贡献的关键文章”，并予以特别报道。
- 2004 年获康明斯技术创新奖“Resolution of HX82 Impeller Slinger Boss LCF”
- 2006 年获康明斯技术创新奖“Semi-Solid Moulding of Impellers”

- 2009 年获北美国际半固态/挤压铸造大奖“Semi-Solid Processed Turbocharger Impellers”
- 1988 年获中国金属学会优秀论文奖 “Phase interface segregation of magnesium in a nick el-base superalloy”

代表性文章专利：

[1] X. Hu, Q. Zhu, X. Lu, F. Zhang, D. Li, S.P. Midson. Microstructural evolution and thixoformability of semi-solid aluminum 319s alloy during re-melting. Journal of Alloys and Compounds, 2015:649, p204-210.

[2] 杨福宝，李丹，章林，景艳红，李大全，朱强．热等静压及后续热处理对高温合金 MIM418 涡轮合金组织与性能的影响．材料热处理学报．36（2015），p129-135.

[3] K. Du, Q. Zhu, D. Li, F. Zhang. Study of formation mechanism of incipient melting in thixo-cast Al–Si–Cu–Mg alloys. Materials Characterization, 2015:106, p134-140.

[4] Q. Zhu, S. P. Midson, C. Ming, Helen V. Atkinson. Casting and Heat Treatment of Turbocharger Impellers Thixocast from Alloy 201. Solid State Phenomena. 2013: 192-193, p556-561.

[5] Q. Zhu and S. P. Midson. Semi-solid moulding: a competition to cast and machine from forging in making automotive complex components. Transaction of Nonferrous Metals, 2010:20, p1042-1047.

[6] Q. Zhu. Semi-Solid Moulding: A New Way of Making Impellers. HTI: The Latest Turbotecharger News, 2008:9, p7-8.

[7] Q. Zhu, C. M. Sellars, H. K. D. H. Bhadeshia. Quantitative metallography of deformed grains. Materials Science and Technology, 2007:23, p757-766.

[8] Q. Zhu, M. F. Abbod, J. Talamantes-Silva, etc. Hybrid modelling of aluminium magnesium alloys during thermomechanical processing in terms of physically-based, neuro-fuzzy and finite element models. Acta Materialia, 2003: 51(17), p5051-5062.

[9] Q. Zhu, C. M. Sellars. Evolution of Microbands in High Purity Aluminium-3% Magnesium during Hot Deformation Testing in Tension-Compression, Scripta Mat, 2001:45, p41-48.

[10] W. Blum, Q. Zhu, R. Merkel, H. J. McQueen. Dynamic restoration mechanisms in hot torsion of Al-5Mg and Al. Zeitschrift für Metallkunde, 1996, Vol:87, p14.

[11] Q. Zhu, D. Wang, H. Ge, G. Chen. Phase interface segregation of magnesium in a nickel-base superalloy. IN 100, Acta Metallurgica Sin. (Eng. Ed.), 1989, Vol:2A, p408.

代表性专利

1. 朱强，景艳红，李大全，和优锋，张帆．半固态压叶轮模具和成形方法: PCT/CN2015/000848.
2. 张帆，陈颂，李大全，和优锋，朱强．一种用于半固态压铸成形的冷室压铸机开口式料筒: CN201520987384.0.
3. 杨福宝，李大全，张帆，朱强．粉末注射成形中空涡轮的合金选择及制备方法: CN104711456. 2015-06-17.
4. 和优锋,李大全，朱强，张帆，许小静．一种半固态压叶轮近成形生产方法: CN104668501. 2015-06-03.
5. 朱强，李大全，和优锋，张帆，许小静．一种涡轮增压器压叶轮半固态压铸成形方法: CN201410737850.X.
6. Q. Zhu, J. Andrew. METHOD AND APPARATUS FOR MANUFACTURING TURBINE OR COMPRESSOR WHEELS: US 8464777. 2013-06-18.
7. 朱强，安德鲁・菲利普・杰克森．用于制造涡轮机或压缩机轮的方法和设备: ZL200680033293. 2014-08-13.
8. 陈国良，王迪，朱强，张顺南，朱耀肖．提高高合金化铸造合金性能的新方法: ZL86108748. 1992-04-22.

指导或正在指导的学生：

指导博士后 1 名：

1. 张帆，铝-硅-铜-镁合金半固态成形理论与技术研究，2012-2014。

博士生 12 名：

1. Sean Winwood (University of Sheffield,UK),Forming mechanism and determination of defects in cast turbine and compressor wheels.2007-2010.
2. 胡小刚（北科大联合培养），半固态成形过程中多相流理论与模拟技术研究。2011-2015
3. 梁小康（硕、博连读），热平衡状态下铝-硅-铜合金控制凝固理论与应用研究。2011-2016
4. 郜俊震（北科大联合培养硕、博连读），基于高温性能的新型高强铝合金研究。2012-2017
5. 卢宏兴（硕、博连读），半固态成形过程中缺陷形成机理与控制研究。2012-2017
6. 杜　康（硕、博连读），不同组织状态下热处理过程中缺陷与沉淀相形成机制。2012-2017
7. 曲文英，多相组织材料流动机理与模拟技术研究。2013-2018
8. 杨志宇（北科大联合培养硕、博连读），合金成分对铝合金热导热性能影响机理与应用。2013-18
9. 罗　敏（硕、博连读），结构-功能一体化铝合金新材料与应用研究。2013-2018
10. 李龙飞（北科大联合培养硕、博连读），稀土元素对铸造铝合金影响机理研究及应用。2014-19
11. 李　江（北科大联合培养硕、博连读），论文题目待定。2015-2020
12. 谢忠南，论文题目待定。2015-2020

硕士生 5 名：

1. 束国刚（北科大与陈国良院士合带），微量元素在铸造高温合金中作用机理研究。1984-1988。
2. V. Demuth（德国与 Blum 教授合带），Hot deformation mechanisms of Class M and Class A aluminium alloys, 1991-1993
3. R. Merkel（德国与 Blum 教授合带），Dislocation behavior during hot deformation of Al-Mg alloys,1992-1994.
4. 冶　平，半固态压叶轮 C-超缺陷探测技术研究。2012-2015
5. 陈　颂，铝合金半固态成形过程模拟与模具设计技术研究。2013-2016

学生辅导员：

82 级材料科学与工程系本科学生辅导员，3 个班 98 名学生。

学生班主任：

84 级材料科学与工程系研究生班主任，1 个班 16 名学生。

所有文章专利：

Book（书）

1. 谢建新, 朱强. 1999. 材料组织性能与先进制备加工技术. 北京: 化学工业出版社.

Journal Article（杂志文章）

1. 朱强, 陈国良, 王迪, 张顺南, 朱耀宵. 铸造高温合金中凝固过程中镁的偏析行为. 材料科学进展, 1988(2), p1.
2. 朱强, 王迪, 陈国良.镍-铬-钴高温合金中微量元素镁分布规律的研究. 北京钢铁学院学报, 1988, Vol: 10(1), p12.
3. 朱强, 王迪, 葛红林, 陈国良. 镁在铸造高温合金 IN100 相界的偏析. 金属学报, 1989, Vol: 25(3), p185.
4. Q. Zhu, D. Wang, H. Ge, G. Chen. Phase interface segregation of magnesium in a nickel-base superalloy. IN 100, Acta Metallurgica Sin. (Eng. Ed.), 1989, Vol: 2A, p408.
5. H. Ge, W. V. Youdlis, G. Chen, Q. Zhu. Interfacial segregation of magnesium in nickel base superalloy: Carbide morphology and properties Mater. Sci. & Tech, 1989, Vol: 5, p985.
6. M. Meier, Q. Zhu, W. Blum. Demonstration of the quantitative differences between class M and

class A deformation behaviors within the composite model. Zeitschrift für Metallkunde,1993, Vol: 84(4), p263.
7. W. Blum, Q. Zhu, R. Merkel, H. J. McQueen. Geometric dynamic recrystallization in hot torsion of AlMgMn. Mater. Sci. and Eng. A, 1996, Vol: 209, p23.
8. W. Blum, Q. Zhu, R. Merkel, H. J. McQueen. Dynamic restoration mechanisms in hot torsion of Al-5Mg and Al. Zeitschrift für Metallkunde, 1996, Vol: 87, p14.
9. 朱强. 铝合金的热塑性形变行为. 材料研究学报, 1997: Vol 11, p24.
10. Q Zhu, H. J. McQueen, W. Blum. Comparison of Substructures in High Temperature Deformed Al-alloys by Polarised Optical Scanning and Transmission Electron Microscopes. High Temperature Materials and Processes, 1998, Vol: 17, p289-297.
11. G. J. Baxter, T. Furu, Q. Zhu, J. A. Whiteman, C. M. Sellars. Influence of Transient Strain-Rate Deformation Conditions on the Deformed Microstructure of Aluminium Alloy A1-1%Mg. Acta Mater, 1999: 47, p2367-2376.
12. C. M. Sellars, Q. Zhu. Microstructural Modelling of Aluminium Alloys during Thermomechanical Processing. Materials Science and Engineering A, 2000: 280, p1-7.
13. Q. Zhu, C. M. Sellars. Microstructural Evolution of Aluminium-Magnesium Alloys during Thermomechanical Processing. Materials Science Forum, 2000: 331-337, p409-420.
14. Q. Zhu, C. M. Sellars. Evolution of Microbands in High Purity Aluminium-3% Magnesium during Hot Deformation Testing in Tension-Compression, Scripta Mat, 2001: 45, p41-48.
15. Q. Zhu, B. P. Wynne, J. H. Beynon, C. M. Sellars. Texture evolution of AA5052 during monotonic and reversed hot deformation and subsequent recrystallization. Materials Science Forum, 2002: 408-412, p1489-1494.
16. M. F. Abbod, D. A. Linkens, Q. Zhu. Semi-Physical Modelling of Internal States for Aluminium Alloys. Materials Science & Engineering A, 2002: 333, p397-408.
17. Q. Zhu, M. F. Abbod, J. Talamantes-Silva, C. M. Sellars, D. A. Linkens, J. H. Beynon. Hybrid modelling of aluminium magnesium alloys during thermomechanical processing in terms of physically-based, neuro-fuzzy and finite element models. Acta Materialia, 2003: 51(17), p5051-5062.
18. M. F. Abbod, C. M. Sellars, D. A. Linkens, Q. Zhu, M. Mahfouf. Validation and generalisation of hybrid models for flow stress andrecrystallisation behaviour of aluminium–magnesium alloys. Materials Science and Engineering A, 2005: 395, 35–46.
19. R. Carmona, Q. Zhu, C. M. Sellars, J. H. Beynon. Controlling mechanisms of deformation of AA5052 aluminium alloy at small strains under hot working conditions. Materials Science and Engineering A, 2005: 393, p157-163.
20. M. F. Abbod, Q. Zhu, D. A. Linkens, C. M. Sellars, M. Mahfouf. Hybrid models for aluminium alloy properties prediction. Control Engineering Practice, 2006: 14, p537–546.
21. M. F. Abbod, Q. Zhu, D. A. Linkens, C. M. Sellars, M. Mahfouf. Construction and validation of complex hybrid neuro-fuzzy models for Al-Mg materials properties prediction. Journal of Control Engineering Practice, 2006:14(5), p537-546.
22. Q. Zhu, C. M. Sellars, H. K. D. H. Bhadeshia. Quantitative metallography of deformed grains. Materials Science and Technology, 2007: 23, 757-766.
23. S. Das, M. F. Abbod, Q. Zhu, E. J. Palmiere, I. C. Howard, D. A. Linkens. A combined neuro fuzzy-cellular automata based material model for finite element simulation of plane strain compression. Computational Materials Science Journal, 2007: 40, 366-375.
24. Q. Zhu. Semi-Solid Moulding: A New Way of Making Impellers. HTI: The Latest Turbotecharger News, 2008: 9, p7-8.
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