Dr. Ji-Cheng (JC) Zhao

Dean of the College of Engineering, University of Connecticut (UConn)
261 Glenbrook Road, Unit 3237, Room 338, Storrs, CT 06269
860-486-2011, jczhao@uconn.edu

Google Scholar: https://scholar.google.com/citations?user=YYDgMjoAAAAJ&hl=en

Experience:

8/2024-Present: Dean of the College of Engineering, University of Connecticut, Storrs, CT.

2019-2024: Department Chair and Clark Distinguished Chair Professor (2023-2024) (Minta Martin Professor of Engineering (2019-2023), Department of Materials Science and Engineering, University of Maryland, College Park, MD.

2017-2019: Professor and Associate Chair for Research, Department of Materials Science and Engineering, The Ohio State University, Columbus, OH.

2014-2017: Program Director, US Department of Energy (DOE) Advanced Research Projects Agency–Energy (ARPA-E), Washington, DC (1/2014–8/2017).

2010-2013: Professor, Department of Materials Science and Engineering, The Ohio State University, Columbus, OH.

2008-2010: Associate Professor, Department of Materials Science and Engineering, The Ohio State University, Columbus, OH.

1995-2007: Senior Materials Scientist & Project/Team Leader, GE Research Center, General Electric Company (GE), Niskayuna/Schenectady, NY.

1991-1995: Research Assistant and Teaching Assistant (Ph.D. student), Lehigh University, Bethlehem, PA.

1988-1991: Professor Assistant, Department of Materials Science and Engineering, Central South University, Hunan, China.

Education:

Lehigh University, Bethlehem, PA
Ph.D. in Materials Science and Engineering, October 1995

Central South University, Hunan, China
M.S. in Materials Science and Engineering, June 1988
B.S. in Materials Science and Engineering, June 1985

Research:

- ***Combinatorial/High-Throughput Materials Research and Materials Property Microscopy***
  - Invented a diffusion-multiple approach for accelerated discovery of new materials. The methodology was featured on the front covers of *Advanced Engineering Materials* (March 2001) and *MRS Bulletin* (April 2002), in a "News and Views" item of *Nature* (by R.W. Cahn: https://dx.doi.org/10.1038/35070692), and in a cover story of *Chemical and Engineering News* (August 27, 2001: https://pubs.acs.org/cen/coverstory/7935/7935combinatorial2.html). A news item of *MRS Bulletin* "Research/Researchers" (https://doi.org/10.1557/mrs2001.132, p. 495) stated "Zhao's method provides a significant step forward by allowing simultaneous determination of structural properties such as plastic hardness, toughness, and elastic modulus – critical features in materials science applications."… "This technique may offer significant potential for practical advances … not only would this technique allow faster concept-to-market turnaround in structural materials design, it should also permit more informed "fine-tuning" of complex materials composition."…"This technique may also generate contributions

in the realm of fundamental scientific interest. In particular, the rapid, in situ property measures may provide feedback very useful for modeling of complex materials."

- Co-developed (with Prof. David Cahill) a set of ultrafast-laser based micron-resolution materials property microscopy tools for thermal conductivity, coefficient of thermal expansion (CTE), and heat capacity [https://doi.org/10.1038/nmat1114, https://doi.org/10.1063/1.2988111, https://doi.org/10.1063/1.4815867].
- Developed a dual-anneal diffusion-multiple (DADM) approach for high-throughput determination of intermediate-temperature phase diagrams and for effective study of phase precipitation [https://dx.doi.org/10.1016/j.actamat.2014.12.027]. The methodology can be employed to generate amazing diversity of microstructures [https://rdcu.be/b5U3J] for discovery of new alloys and to validate precipitation model predictions.
- Developed a method to measure single-crystal elastic constants from polycrystalline samples using ultrafast laser generated surface acoustic wave velocity measurements. The method will provide easy measurement of elastic constants of solid solutions without making single crystals [http://rdcu.be/ryL6].
- Developed a forward-simulation analysis (FSA) for reliable extraction of both *impurity* (*dilute)* and interdiffusion coefficients from regular diffusion couple concentration profiles [http://doi.org/10.1016/j.intermet.2012.11.012]. Accurate extraction of impurity diffusion coefficients is significant [https://doi.org/10.1016/j.scriptamat.2016.09.040] since it is impractical to rely on the laborious tracer experiments to obtain the thousands of missing impurity diffusion coefficients which are the foundation of reliable diffusion (mobility) databases for simulation of materials processes.
- Developed an elegant liquid-solid diffusion couple (LSDC) design that allows reliable and efficient determination of impurity and interdiffusion coefficients for challenging systems with low eutectic temperatures and/or limited solubility such as Ca diffusion in Mg (no data was ever obtained before) [https://doi.org/10.1016/j.scriptamat.2016.09.008]; and applied both LSDCs and diffusion multiples to obtain the most reliable and comprehensive experimental measurements of diffusion of 10 elements (Al, Ca, Ce, Gd, Li, Mn, Nd, Sn, Y and Zn) in Mg and established the best database in the world (https://doi.org/10.1016/j.actamat.2020.09.079).
- Co-developed (with John Allison) a novel high-throughput method to measure interfacial energy – an essential but difficult to measure parameter for understanding and modeling nucleation and growth of precipitates [https://doi.org/10.1016/j.mtla.2018.10.003].
- Participated at the development (invented by Prof. Liangbing Hu) of a new ultrafast high-temperature sintering (UHS) method that enables synthesis of ceramics and metals in seconds from elemental powders or chemical precursors. The methodology was featured on the **cover** of ***Science*** (May 1, 2020) [https://science.sciencemag.org/content/368/6490] and also featured in 9 news outlets including *Yahoo! News*, *C&EN*, *ScienceDaily*, *EurekaAlert*, *Phys.org*, *Ceramics.org*, *Nanotechnology Now*, and *The Independent*. UHS synthesis is also applicable to a wide range of metals including very high-melting point alloys [https://doi.org/10.1002/advs.202004229] and cermets (ceramic-metal composites) [https://doi.org/10.1016/j.matt.2021.11.008].
- Co-invented (with Prof. Liangbing Hu as the lead inventor and Prof. Yiguang Ju as a co-inventor) a uniform, ultrahigh-temperature, stable plasma (USP) that can be easily set up at a lab using a low electrical voltage such as 50 volts and can reach 8,000 K – hotter than the surface of the Sun. The USP technology can substantially facilitate the synthesis of materials and chemicals. The invention was featured in an article in *Nature* (https://rdcu.be/dslih; https://youtu.be/xEAYulyOZq4), and news stories in *Chemistry World* and *Nature Synthesis*. A spinoff company has been formed to scale up and commercialize the technology (https://www.usplasma.com/).

- ***Computational Thermodynamics & Kinetics for Design of Advanced Alloys***
  - Introduced thermodynamic software (Thermo-Calc) to GE Research in 1996 and spent several years to make it one of the key computational alloy design tools at GE; worked with several organizations to measure phase diagrams and perform thermodynamic modeling to improve thermodynamic databases for Ni-base superalloys and Nb silicide composites.
  - Developed a robust 1-parameter-only Z-Z-Z model to mathematically describe diffusion coefficients and atomic mobilities of binary solid solutions [https://doi.org/10.1016/j.actamat.2021.117077] as well as simplified models for ternary and multicomponent systems [https://doi.org/10.1016/j.scriptamat.2021.114227] which will substantially reduce the number of fitting parameters for binary and multicomponent diffusion (mobility) databases for kinetic modeling in materials science.
  - Studied composition-structure-property relationships in Ni-based superalloys and Nb silicide in-situ composites under the support of both GE and US Air Force.
  - Led several bond-coat development projects at GE Research and developed new coatings.
  - Co-invented high-temperature alloy superalloy GTD262 which is now widely used in GE electricity generation gas turbines (both new makes and replacement parts for existing fleets as a complete replacement of a GE workforce alloy GTD222). The computational design of GTD262, which was developed in four years from concept to production, was cited as one of the two successful ICME alloy design examples in a National Research Council report "*Application of Lightweighting Technology to Military Aircraft, Vessels, and Vehicles*" [http://www.nap.edu/read/13277/chapter/7#118; p. 118-119].
  - Co-invented technologies leading to 49 issued U.S. patents and 18 additional U.S. patent applications on various new materials, processes and energy storage and conversion systems.
  - Co-developed (with Wolfgang Windl) a general model for both thermal and electrical conductivity of metallic systems based on a new and physically correct interpretation of the scattering processes using calculated orbital and element-resolved density-of-states values from DFT and experimental data – the model enables incorporation of thermal and electrical conductivity into the CALPHAD framework [https://doi.org/10.1016/j.actamat.2016.12.047].
- ***Hydrogen Storage Materials and Boron Chemistry***
  - Served as leader of the GE hydrogen storage team in developing new hydrogen storage materials and innovative hydrogen and energy storage systems; obtained 6 U.S. patents on hydrogen/energy storage materials and devices.
  - Served as one of the US experts in the International Energy Agency (IEA) hydrogen storage Task 17 and Task 22, and as a member of Coordination Council of the DOE Metal Hydride Center of Excellence (MHCoE).
  - Co-developed (with Sheldon Shore) new synthesis methods for $Mg(BH_4)_2$, NH_3BH_3, $NH_2B_2H_5$, $[H_2B(NH_3)_2][BH_4]$, NaB_3H_8, $NH_4B_3H_8$, $[H_2B(NH_3)_2][BH_4]$ and several other compounds and examined their suitability for hydrogen storage.
  - Revealed (with Sheldon Shore) the dominant role of dihydrogen bonds in the formation of $[H_2B(NH_3)_2][BH_4]$ in the reaction of NH_3 with $THF{\cdot}BH_3$, and solved a mechanistic "puzzle" in boron chemistry [https://doi.org/10.1021/ja203648w; http://doi.org/10.1021/ar400099g].
  - Identified (with Chris Wolverton and Sheldon Shore) the structure of AlB_4H_{11}, one of the very rare inorganic amorphous chain polymer compounds through a highly collaborative study combining state-of-the-art computation with careful experimental measurements [https://doi.org/10.1039/C2SC21100A]; synthesized another rare inorganic chain compound $NH_3BH_2NH_2BH_3$ – an inorganic analogue of butane [https://doi.org/10.1021/ja104938v].

ARPA-E Program Creation and Management:

- Initiated and developed a $32 million ($25M regular + $7M SBIR) ARPA-E GENSETS Program (https://arpa-e.energy.gov/?q=arpa-e-programs/gensets) – *GENerators for Small*

Electrical and Thermal Systems – to fund the development of transformative generators with kW scale of electrical output, high efficiency, long life, low cost, and low emissions. Such transformative generator technologies will lay the foundation for widespread deployment of residential and commercial combined heat and power (CHP) that provides distributed generation of electricity from piped-in natural gas at a residence or a commercial site complemented by use of exhaust heat for local heating and cooling. If adopted widely by U.S. residential and commercial sectors, GENSETS CHP systems could lead to substantial annual primary energy savings and CO_2 emissions reductions.

- Initiated (together with Ron Faibish and Alex Larzelere) and helped launch (with Rachel Slaybaugh) the ARPA-E MEITNER (Modeling Enhanced Innovations Trailblazing Nuclear Energy Reinvigoration) program to fund innovative designs of advanced nuclear power plants and computational validation of these designs that can achieve safe, secure, and economical nuclear power production. [https://arpa-e.energy.gov/events/safe-secure-megawatt-size-nuclear-power-workshop; https://www.youtube.com/watch?v=-jERkHhw2Ec; https://arpa-e.energy.gov/technologies/programs/meitner].
- Managed other ARPA-E projects totaling about $30 million such as the REACT (Rare Earth Alternatives in Critical Technologies – initiated by Mark Johnson) permanent magnet projects and other teams and projects under the OPEN programs and the IDEAS program span a wide range of technologies including structural materials, solar materials and manufacturing processes, and magnetocaloric materials.

Awards and Recognitions:

- Member of the National Academy of Engineering (NAE), Class of 2023. Citation: *For contributions to computational alloy design, integrated computational materials engineering, and high-throughput methods leading to impactful industrial products*. https://mse.umd.edu/news/story/jc-zhao-elected-to-national-academy-of-engineering-nae
- Clark Distinguished Chair Professor (2023-2024): https://eng.umd.edu/news/story/clark-school-names-zhao-chopra-as-clark-distinguished-chairs
- Fellow of TMS (The Minerals, Metals and Materials Society), Class of 2023. Citation: *For contributions to high-throughput research and diffusion studies in metals and early implementation of computational alloy design in turbine industry leading to high-impact alloy deployment*. https://mse.umd.edu/news/story/jc-zhao-named-tms-fellow
- 2023 J. Willard Gibbs Phase Equilibria Award from ASM International. Citation: *For developing highly efficient methods that employ combinatorial principles, and successfully applying them to the determination of phase diagrams, diffusion coefficients, and physical properties in alloy systems*. https://mse.umd.edu/news/story/jc-zhao-receives-j-willard-gibbs-phase-equilibria-award
- Fellow of the National Academy of Inventors (NAI), Class of 2022 https://today.umd.edu/maryland-engineers-named-to-national-academy-of-inventors
- Fellow of AAAS (American Association for the Advancement of Science), Class of 2022 https://today.umd.edu/seven-faculty-researchers-named-aaas-fellows
- Humboldt Research Award, Alexander von Humboldt Foundation (Stiftung), 2022 https://www.mpie.de/4775573/ji-cheng-zhao-humboldt-award
- 2021 William Hume-Rothery Award from TMS – "*This award is presented annually to recognize a scientific leader for exceptional scholarly contributions to the science of alloys*." A 3-day symposium was held in his honor on March 15-17, 2021 during the 150th TMS Annual Meeting. Citation: *For development of groundbreaking methodologies for systematic measurements of phase-based properties for the understanding of a very large number of alloy systems*. https://mse.umd.edu/news/story/mse-chair-jc-zhao-receives-prestigious-william-humerothery-award

- Fellow of MRS, Class of 2019. Citation: *For pioneering research on high-throughput measurement in the field of structural materials through the invention and application of the diffusion-multiple approach and co-invention of ultrafast laser materials–property microscopy tools.*
- The invention of ultrafast laser materials property microscopy by the Zhao-Cahill team was recognized as one of the eight finalists for the 2018 *Berthold Leibinger Innovationspreis*, the highest remunerated international prizes dedicated to laser technology innovations [https://optics.org/news/9/7/37].
- Member of the Subcommittee on the Materials Genome Initiative of the White House Office of Science and Technology Policy (OSTP) (2014 to 2017).
- Lumley Interdisciplinary Research Award (with Prof. Sheldon Shore), College of Engineering, The Ohio State University, April, 2013.
- Selected by NAE as one of 30 outstanding young engineers from U.S. with 30 outstanding engineers from China to participate at the 1st China-America Frontiers of Engineering Symposium in Beijing and Changsha, October 17-21, 2009.
- Selected by NAE as one of eighty-two brightest young engineers to attend the NAE 2008 Frontiers of Engineering Symposium, 2008. https://www.naefrontiers.org/16987/Creative-Young-Engineers-Selected-to-Participate-in-NAEs-2008-Frontiers-of-Engineering-Symposium-
- Fellow of ASM International, Class of 2003. Citation: *For development of a new combinatorial approach enabling rapid determination of composition-structure-property relationships in high-temperature structural alloys.*
- Albert W. Hull Award from GE Global Research (the highest individual achievement award at GE Research for a young scientist – one or two per year for the entire Research Center across all disciplines), 2001. Citation: *For his leadership skills in advancing innovative, state-of-the-art development methodologies that aim to decrease cycle time for materials discovery while increasing robustness of the work. He also was recognized for his expertise and leadership regarding the critical nature of coatings and high temperature materials, and for his enormous energy and perseverance in solving real business challenges*.
- Alfred H. Geisler Memorial Award from ASM International (Eastern New York Chapter, https://connect.asminternational.org/asmeasternny/awards), 2001 [Winners include two former university presidents and 9 NAE members].

Professional Services:

a) Editorships:

- Associate Editor, *Journal of Materials Informatics* (2021-Present)
- Associate Editor, *Journal of Phase Equilibria and Diffusion* (Springer) (2002-Present).
- Editorial Board of *Intermetallics* (Elsevier) (2014-Present)
- Advisory Board of *Rare Metals* (Springer) (2012-Present).
- Advisory Board of *Progress in Natural Science: Materials International* (Elsevier) (2011-present).
- Advisory Board of *Advanced Engineering Materials* (Wiley-VCH) (2005-Present).
- Volume Co-Organizer of *MRS Bulletin* 2006 themes. https://doi.org/10.1557/mrs2005.21
- Guest Editor, September 2003 issue of *MRS Bulletin* on Ultrahigh Temperature Materials for Jet Engines (https://doi.org/10.1557/mrs2003.189).
- Guest Editor, April 2002 issue of *MRS Bulletin* on Combinatorial Materials Science (https://doi.org/10.1557/mrs2002.96).

b) Reviewer for:
Nature, Science, Nature Materials, Nature Communications, Scientific Reports, Journal of American Chemical Society, Energy and Environmental Science, npj Computational Materials, Acta Materialia, Materials Today, Scripta Materialia, MRS Bulletin, Materials & Design, Metallurgical and Materials Transactions, Journal of the American Ceramic Society, Journal of Physical Chemistry, Energies, Journal of Solid State Chemistry, Intermetallics, Dalton Transactions, Oxidation of Metals, Advanced Engineering Materials, Journal of Materials Research, Journal of Materials Science, Journal of Electronic Materials, International Journal of Hydrogen Energy, Journal of Alloys and Compounds, International Journal of Materials Research (Zeitschrift für Metallkunde), Integrating Materials and Manufacturing Innovation, Materials Science and Engineering A, Science and Technology of Advanced Materials, Modelling and Simulation in Materials Science and Engineering, Journal of Combinatorial Chemistry, CALPHAD, Materials Characterization, Surface and Coating Technology, Steel Research International, Journal of Phase Equilibria and Diffusion, and Industrial & Engineering Chemistry Research.

c) Membership in Professional Committees:
- The Government Engagement Working Group of the Engineering Research Visioning Alliance (ERVA) – an NSF-funded partnership that identifies future engineering research directions to impact national research priorities (2021-2023). https://www.ervacommunity.org/working-group/government-engagement/
- MRS Awards Committee (Subcommittee) (2022-2023)
- Board of Trustees of ASM International (2019-2022 term)
- Chair of the ASM Board of Trustees' Digital Task Force (2021-2022)
- Member of the ASM Board of Trustees' Finance Committee (2021-2023)
- Member of the Selection Committee for ASM Awards (2020-2023)
- Chair (2017-2019) and member (2012-Present) of the ASM Materials Properties Database Committee (MPDC).
- Advisor to JOM (Journal of the Minerals, Metals and Materials Society) from the TMS Advanced Characterization, Testing and Simulation Committee (2009-2010).
- Member of the TMS Alloy Phases Committee, TMS (1998-2008 & 2011-Present).
- Member of the TMS Integrated Computational Materials Engineering (ICME) Committee, TMS (2011-present).
- Member of the TMS Advanced Characterization, Testing and Simulation Committee (2008-2013).
- Member of the MRS Program Development Subcommittee (2008-2011).
- Member of the Coordination Council of the DOE Metal Hydride Center of Excellence (MHCoE) (2008-2010).
- Member of the MRS Industrial Meeting Participation Task Force (2006-2007).
- Member of the U.S. expert representatives on the International Energy Agency (IEA) Task 17 and Task 22 on hydrogen storage (2006-2011).
- Member of the Book Review Board, *MRS Bulletin*, MRS (2003-2008).
- Member of the TMS High Temperature Alloys Committee (2001–Present).
- Member of the ASM Thermodynamics and Phase Equilibria Committee (2000-2006).

Organizer of Professional Conferences:
- Co-Organizer, Symposium on *Thermodynamics and Kinetics of Alloys*, 2024 TMS Annual Meeting, March 3-9, 2024: Orlando, FL (upcoming).
- Co-Organizer, Symposium on *Thermodynamics and Kinetics of Alloys*, 2023 TMS Annual Meeting, March 19-23, 2023: San Diego, CA.

- Co-Organizer, Symposium on *Materials Design Approaches and Experiences V*, 2020 TMS Annual Meeting, February 23-27, 2020: San Diego, CA.
- Co-Chair (with Peter Gumbsch and Dennis Dimiduk), *Gordon Research Conference on Physical Metallurgy*, 2017: https://www.grc.org/programs.aspx?id=13797.
- Co-Organizer, Symposium on Phase Stability, Diffusion Kinetics, and Their Applications (PSDK-XII), Materials Science & Technology 2017 (MS&T'17), Pittsburgh, October 8-12, 2017 (ACerS, AIST, ASM & TMS).
- Co-Organizer, Symposium on Phase Stability, Diffusion Kinetics, and Their Applications (PSDK-XI), Materials Science & Technology 2016 (MS&T'16), Salt Lake City, October 23-27, 2016 (ACerS, AIST, ASM & TMS).
- Co-Organizer, Symposium on *Materials Design Approaches and Experiences IV*, 2016 TMS Annual Meeting, February 14-18, 2016: Nashville, TN.
- Vice-Chair, Gordon Research Conference on Physical Metallurgy, Biddeford, Maine, July 19-24, 2015.
- Executive Committee Member and Symposium Co-Coordinator, THERMEC 2013 (International Conference on Processing & Manufacturing of Advanced Materials), Las Vegas, December 2-6, 2013 (Co-sponsored by TMS, ASM and 12 other societies).
- Member of the International Scientific Committee of the First Asian Conference on Aluminum Alloys (ACAA-2013), Beijing, China, October 13-17, 2013.
- Lead Organizer of an International Conference on "*Harnessing the Materials Genome: Accelerated Materials Development via Computational and Experimental Tools*", Vail, Colorado (with Mark Asta, Peter Gumbsch and Boyun Huang), September 30 to October 4th, 2012. https://www.eurekalert.org/pub_releases/2012-06/eci-htm062712.php
- Lead Organizer, TMS Symposium on Materials Design Approaches and Experiences III, TMS Annual Meeting, Orlando, FL, March 12-15, 2012.
- Co-Organizer, Joining and Sustaining of Superalloys Symposium at Materials Science and Technology 2011 (MS&T'11), Columbus, OH, October 16-20, 2011.
- Co-Chair (one of four) for the MRS 2009 Fall Meeting with 51 symposia that attracted ~6,200 attendees and about 400 exhibitors. https://doi.org/10.1557/mrs2009.13
- Co-Organizer, Symposium X, MRS Fall 2009 Meeting.
- Co-Organizer, Symposium on High-Density Hydrogen Storage for Automotive Applications: Materials and Methods at the Materials Science and Technology Conference (M&ST'07), September 16-20, 2007 (ACerS, AIST, ASM & TMS).
- Organizing Committee Member, International Symposium of Metal-Hydrogen Systems [MH2006], October 1-6, 2006 in Lahaina, Maui, Hawaii.
- Lead Organizer, Symposium on Hydrogen Storage Technologies at the MRS Fall Meeting 2006.
- Advisory Committee Member, The 1st and 2nd International Conferences on Diffusion in Solids and Liquids (DSL-2005 and DSL-2006), Aveiro, Portugal.
- Co-Organizer, TMS Symposium on *Materials Design Approaches and Experiences II*, 2006 TMS Annual Meeting, March 12-16, 2006, San Antonio, Texas.
- Lead Organizer, TMS symposium on *Materials Design Approaches and Experiences*, 2001 TMS Fall Meeting, November 4-8, 2001, Indianapolis, IN.

Publications:

a) Edited Books and Journal Issues:

1. J.-C. Zhao (editor), *Methods for Phase Diagram Determination*, Elsevier (Amsterdam, 2007), ISBN-13: 978-0-08-044629-5, 511 pp. https://www.sciencedirect.com/science/book/9780080446295

2. J.-C. Zhao, I.M. Robertson and S.-I. Orimo (editors), *Hydrogen Storage Technologies* (Materials Research Society (MRS) Symposium Proceedings 971E), MRS (Warrendale, PA, 2007).
3. J.-C. Zhao, M. Fahrmann and T.M. Pollock (editors), *Materials Design Approaches and Experiences*, TMS (Warrendale, PA, 2001), ISBN: 0-87339-503-4, 396 pp.
4. U. Kattner, C.E. Campbell, Y. Sohn, and J.-C. Zhao (Special issue editors), December 2022 issue of the *Journal of Phase Equilibria and Diffusion* in memory of John E. Morral. https://link.springer.com/journal/11669/volumes-and-issues/43-6
5. J.-C. Zhao, Q. Chen, and Y. Du (Special issue editors), December 2021 issue of the *Journal of Phase Equilibria and Diffusion* in memory of Professor Zhanpeng Jin, December 2021. https://link.springer.com/journal/11669/volumes-and-issues/42-6
6. J.-C. Zhao, Q. Chen, and Y. Du (Special issue editors), October 2018 issue of the *Journal of Phase Equilibria and Diffusion* celebrating the 80th birthday of Professor Zhanpeng Jin, October 2018. https://link.springer.com/journal/11669/volumes-and-issues/39-5
7. M.C. Gao, J.-C. Zhao, and John Morral (Special issue editors): August 2017 special issue of *Journal of Phase Equilibria and Diffusion* on The Thermodynamics and Kinetics of High-Entropy Alloys. https://link.springer.com/journal/11669/volumes-and-issues/38-4
8. J. Simmons and J.-C. Zhao (topic organizers): March issue and July issue of *JOM* on Large Dataset Generation, Integration and Simulation in Materials Science, March and July 2011.
9. J.-C. Zhao, Y. Du, and Q. Chen (Special issue editors), October issue of the *Journal of Phase Equilibria and Diffusion* honoring the 70th birthday of Professor Zhanpeng Jin, October 2009. https://link.springer.com/journal/11669/volumes-and-issues/30-5
10. J.-C. Zhao and J.H. Westbrook (Guest Editors), September 2003 issue of *MRS Bulletin* on Ultrahigh Temperature Materials for Jet Engines. https://link.springer.com/journal/43577/volumes-and-issues/28-9
11. E.J. Amis, X.-D. Xiang, and J.-C. Zhao (Guest Editors), April 2002 issue of *MRS Bulletin* on Combinatorial Materials Science. https://link.springer.com/journal/43577/volumes-and-issues/27-4

b) Book Chapters

12. Gokul Vishwanathan, Julian Sculley, David Tew, and Ji-Cheng Zhao, "A Review of Residential Scale Natural Gas Powered Micro-Combined Heat and Power Engine Systems", Chapter 14 in *Natural Gas Engines*, K.K. Srinivasan, A.K. Agarwal, S.R. Krishnan, and V. Mulone, ed., Springer, 2019, pp. 381-419. https://doi.org/10.1007/978-981-13-3307-1_14
13. J.-C. Zhao, "The Role of Phase Transformation Kinetics in Phase Diagram Determination and Assessment", Chapter 2 in *Methods for Phase Diagram Determination*, J.-C. Zhao, ed., Elsevier (Amsterdam, 2007), p. 22-50.
14. J.-C. Zhao, "Phase Diagram Determination Using Diffusion Multiples", Chapter 7 in *Methods for Phase Diagram Determination*, J.-C. Zhao, ed., Elsevier (Amsterdam, 2007), p. 246-272.
15. J.-C. Zhao and J.H. Westbrook, "Miscellaneous Topics on Phase Diagrams", Chapter 16 in *Methods for Phase Diagram Determination*, J.-C. Zhao, ed., Elsevier (Amsterdam, 2007), p. 483-494.
16. J.-C. Zhao, L.A. Peluso, L.N. Brewer, and M.R. Jackson, "Diffusion Multiples for High Efficiency Alloy Design", Chapter 16 in *High Throughput Analysis: A Tool for Combinatorial Materials Science*, edited by R.A. Potyrailo and E.J. Amis (Kluwer Academic / Plenum Publishers, NY, 2003), p. 349-375.

c) Peer Reviewed Journal Articles

17. Hui Sun, Chuangye Wang, Shun-Li Shang, Allison M. Beese, Ji-Cheng Zhao, and Zi-Kui Liu, "Thermodynamic Modeling of the Fe-Nb and Fe-Nb-Ni Systems Supported by First-

Principles Calculations and Diffusion-Multiple Measurements", *Acta Materialia*, vol. 268, 119747, 2024. https://doi.org/10.1016/j.actamat.2024.119747

18. Karoline Elerbrock Borowski, Vitória de Melo Silveira, Nabil Chaia, Chuangye Wang, Ji-Cheng Zhao, Carlos Angelo Nunes, Gilberto Carvalho Coelho, "Diffusion Coefficients and Atomic Mobilities in the BCC Phase of the Al–Nb–V System", *CALPHAD*, vol. 85, 102699 2024. https://doi.org/10.1016/j.calphad.2024.102699
19. Hua Xie, Victor K. Champagne III, Wei Zhong, Bryson Clifford, Shufeng Liu, Liangbing Hu, Ji-Cheng Zhao, David R. Clarke, "Design, Fabrication, and Screening of Environmental-Thermal Barrier Coatings Prepared by Ultrafast High Temperature Sintering", *Advanced Functional Materials*, vol. 33, 2309978, 2023. https://doi.org/10.1002/adfm.202309978
20. Chuangye Wang, Wei Zhong, Ji-Cheng Zhao, "Solubility Data of Eight Common Alloying Elements in Magnesium", *Journal of Phase Equilibria and Diffusion*, vol. 44, pp. 679-686, 2023. https://doi.org/10.1007/s11669-023-01077-5 (https://rdcu.be/dsFKy)
21. Hua Xie, Ning Liu, Qian Zhang, Hongtao Zhong, Liqun Guo, Xinpeng Zhao, Daozheng Li, Shufeng Liu, Zhennan Huang, Aditya Dilip Lele, Alexandra H. Brozena, Xizheng Wang, Keqi Song, Sophia Chen, Yan Yao, Miaofang Chi, Wei Xiong, Jiancun Rao, Minhua Zhao, Mikhail N. Shneider, Jian Luo, Ji-Cheng Zhao,* Yiguang Ju,* Liangbing Hu*, "A Stable Atmospheric-Pressure Plasma for Extreme-Temperature Synthesis", ***Nature***, vol. 623, pp. 964-971, 2023. https://doi.org/10.1038/s41586-023-06694-1 (https://rdcu.be/dslih). Nature YouTube news: https://youtu.be/xEAYulyOZq4
22. Chuangye Wang, Wei Zhong, Jess Garnett, Ji-Cheng Zhao, "High-Throughput Evaluation of Hardening Coefficients of Eight Alloying Elements in Magnesium", *Advanced Engineering Materials*, vol. 25, 2300847, 2023. https://doi.org/10.1002/adem.202300847
23. Noah Kohlhorst, Kevin Faraone, Roger Miller, Govindarajan Muralidharan, George Ulrich, and Ji-Cheng Zhao, "A Technique for the Quantitative Characterization of Weld Microstructure and Application to Mo Welds", *Metallurgical and Materials Transactions B*, vol. 54, pp. 1434-1448, 2023. https://doi.org/10.1007/s11663-023-02771-y
24. Michael Marshall, Meysam Akbari, Ji-Cheng Zhao, Kevin Hoopes, "Design of an Additively Manufactured Recuperator with 800 °C Inlet Temperature for sCO_2 Power Cycle", *Journal of Engineering for Gas Turbines and Power*, vol. 145, 021012, 2023. https://doi.org/10.1115/1.4055723
25. Wei Zhong and Ji-Cheng Zhao, "Vacancy Wind Factor of Diffusion of 13 Binary Metallic Solid Solutions", *Journal of Phase Equilibria and Diffusion*, vol. 43, pp. 629-633, 2022. https://doi.org/10.1007/s11669-022-01013-z
26. Yaxian Wang, Zhangqi Chen, Wolfgang Windl, and Ji-Cheng Zhao, "Nonlinear Arrhenius Behavior of Self-Diffusion in β-Ti and Mo", *Physical Review Materials*, vol. 6, 063402, 2022. https://doi.org/10.1103/PhysRevMaterials.6.063402
27. Chuangye Wang, Wei Zhong, Ji-Cheng Zhao, "Insights on Phase Formation from Thermodynamic Calculations and Machine Learning of 2436 Experimentally Measured High Entropy Alloys", *Journal of Alloys and Compounds*, vol. 915, 165173, 2022. https://doi.org/10.1016/j.jallcom.2022.165173
28. Girfan Shamsutdinov, Peng Zhao, Sreenivas Bhattiprolu, Ji-Cheng Zhao, and Boris Nadgorny, "Magnetization–Structure–Composition Phase Diagram Mapping in Co-Fe-Ni Alloys using Diffusion Multiples and Scanning Hall Probe Microscopy", *Scientific Reports*, vol. 12, 1957, 2022. https://doi.org/10.1038/s41598-022-05121-1
29. Miao Guo, Qi Dong, Hua Xie, Chengwei Wang, Yunhao Zhao, Xizheng Wang, Wei Zhong, Zhihan Li, Ruiliu Wang, Shuaiming He, Wei Xiong, Ji-Cheng Zhao, Liangbing Hu, "Ultrafast High-Temperature Sintering to Avoid Metal Loss Toward High-Performance and Scalable Cermets", *Matter*, vol. 5, pp. 594-604, 2022. https://doi.org/10.1016/j.matt.2021.11.008

30. Wei Zhong, Ji-Cheng Zhao, "Recommendations for Simplified and Robust Assessments of Atomic Mobilities and Diffusion Coefficients of Ternary and Multicomponent Solid Solutions", *Scripta Materialia*, vol. 207, 114227, 2022. https://doi.org/10.1016/j.scriptamat.2021.114227
31. Wei Zhong, Qiaofu Zhang, Ji-Cheng Zhao, "A Simple Yet General Model of Binary Diffusion Coefficients Emerged from a Comprehensive Assessment of 18 Binary Systems", *Acta Materialia*, vol. 215, 117077, 2021. https://doi.org/10.1016/j.actamat.2021.117077
32. Wendao Li, Longfei Li, Stoichko Antonov, Changdong Wei, Ji-Cheng Zhao, Qiang Feng, "High-Throughput Exploration of Alloying Effects on the Microstructural Stability and Properties of Multi-component CoNi-base Superalloys", *Journal of Alloys and Compounds*, vol. 881, 160618, 2021. https://doi.org/10.1016/j.jallcom.2021.160618
33. Noah Kohlhorst, Angshuman Kapil, Zhangqi Chen, Anupam Vivek, Taeseon Lee, J.-C. Zhao, and Glenn Daehn, "Microstructure and Fracture Toughness of an Aluminum-Steel Impact Weld and Effect of Thermal Exposure", *Metallurgical and Materials Transactions A.*, vol. 52, pp. 2795-2810, 2021. https://doi.org/10.1007/s11661-021-06269-7
34. Wendao Li, Longfei Li, Changdong Wei, Ji-Cheng Zhao, Qiang Feng, "Effects of Ni, Cr and W on the Microstructural Stability of Multicomponent Co-Ni-base Superalloys Studied Using CALPHAD and Diffusion-Multiple Approaches", *Journal of Materials Science and Technology*, vol. 80, pp. 139-149, 2021. https://doi.org/10.1016/j.jmst.2020.10.080
35. Chengwei Wang, Wei Zhong, Weiwei Ping, Zhiwei Lin, Ruiliu Wang, Jiaqi Dai, Miao Gou, Wei Xiong, Ji-Cheng Zhao, Liangbing Hu, "Rapid Synthesis and Sintering of Metals from Powders", *Advanced Science*, vol. 8, 2004229, 2021. https://doi.org/10.1002/advs.202004229
36. Wei Zhong and Ji-Cheng Zhao, "A Comprehensive Diffusion Mobility Database Comprising 23 Elements for Magnesium Alloys", *Acta Materialia*, vol. 201, 191-208, 2020. https://doi.org/10.1016/j.actamat.2020.09.079
37. Christopher M. Eastman Jr., Qiaofu Zhang, and Ji-Cheng Zhao, "Diffusion Coefficients and Phase Equilibria of the Cu-Zn Binary System Studied Using Diffusion Couples", *Journal of Phase Equilibria and Diffusion*, vol. 41, pp. 642-653, 2020. https://doi.org/10.1007/s11669-020-00831-3 (Editor's Choice Award of JPED 2020).
38. Ji-Cheng Zhao, "High-Throughput and Systematic Study of Phase Transformations and Metastability using Dual-Anneal Diffusion Multiples", *Metallurgical and Materials Transactions A.*, vol. 51, pp. 5006-5022, 2020. https://doi.org/10.1007/s11661-020-05915-w or https://rdcu.be/b5U3J
39. Wei Zhong and Ji-Cheng Zhao, "First Measurement of Diffusion Coefficients of Lithium in Magnesium", *Materialia*, vol. 11, art. 100674, 2020. https://doi.org/10.1016/j.mtla.2020.100674
40. Chengwei Wang, Weiwei Ping, Qiang Bai, Huachen Cui, Ryan Hensleigh, Ruiliu Wang, Alexandra H. Brozena, Zhenpeng Xu, Jiaqi Dai, Yong Pei, Chaolun Zheng, Glenn Pastel, Jinlong Gao, Xizheng Wang, Howard Wang, Ji-Cheng Zhao, Bao Yang, Xiaoyu (Rayne) Zheng, Jian Luo, Yifei Mo, Bruce Dunn, Liangbing Hu, "A General Method to Synthesize and Sinter Bulk Ceramics in Seconds", ***Science***, vol. 368, pp. 521-526, 2020. https://doi.org/10.1126/science.aaz7681 (Featured on the **cover of *Science*** (May 1, 2020): https://science.sciencemag.org/content/368/6490)
41. Noah Kohlhorst, Govindarajan Muralidharan, Roger G. Miller, and Ji-Cheng Zhao, "On the Quantitative Characterization of Weld Microstructures", *Scripta Materialia*, vol. 182, pp. 62-67, 2020. https://doi.org/10.1016/j.scriptamat.2020.02.026
42. M.S. Hooshmand, W. Zhong, J.-C. Zhao, W. Windl, M. Ghazisaeidi, "Data on the comprehensive first-principles diffusion study of the aluminum-magnesium system", *Data in Brief*, vol. 30, 105381, 2020. https://doi.org/10.1016/j.dib.2020.105381

43. Wei Zhong, Mohammad Shahriar Hooshmand, Maryam Ghazisaeidi, Wolfgang Windl, and Ji-Cheng Zhao, "An Integrated Experimental and Computational Study of Diffusion and Atomic Mobility of the Aluminum-Magnesium System", *Acta Materialia*, vol. 189, pp. 214-231, 2020 https://doi.org/10.1016/j.actamat.2019.12.054
44. Christopher M. Eastman Jr. and Ji-Cheng Zhao, "Phase Equilibria and Diffusion in the Ni-Cr-Pt System at 1200 °C", *Journal of Phase Equilibria and Diffusion*, vol. 40, pp. 542-552, 2019. https://doi.org/10.1007/s11669-019-00753-9; https://rdcu.be/bOCZZ
45. Wei Zhong and Ji-Cheng Zhao, "Measurements of Diffusion Coefficients of Ce, Gd and Mn in Mg", *Materialia*, vol. 7, 100353, 2019. https://doi.org/10.1016/j.mtla.2019.100353
46. Zhangqi Chen, Qiaofu Zhang, and Ji-Cheng Zhao, "pydiffusion: A Python Library for Diffusion Simulation and Data Analysis", *Journal of Open Research Software*, vol. 7, 13, 2019. https://doi.org/10.5334/jors.255
47. J. de Pablo, N.E. Jackson, M.A. Webb, L.-Q. Chen, J. Moore, D. Morgan, T. Pollock, D. Schlom, E. Toberer, J. Analytis, I. Dabo, D. DeLongchamp, G.A. Fiete, G. Grason, G. Hautier, Y. Mo, K. Rajan, E. Reed, E. Rodriguez, V. Stevanovic, J. Suntivich, K. Thornton, and J.-C. Zhao, "New frontiers for the materials genome initiative", *npj Computational Materials*, vol. 5, 41, 2019. https://doi.org/10.1038/s41524-019-0173-4
48. Paul D. Garman, Jared M. Johnson, Vishank Talesara, Hao Yang, Xinpeng Du, Junjie Pan, Dan Zhang, Jianfeng Yu, Eusebio Cabrera, Ying-Chieh Yen, Jose Castro, Wu Lu, Ji-Cheng Zhao, Jinwoo Hwang, and L. James Lee, "Dual Silicon Oxycarbide Accelerated Growth of Well-Ordered Graphitic Networks for Electronic and Thermal Applications", *Advanced Materials Technologies*, vol. 4, 1800324, 2019. https://doi.org/10.1002/admt.201800324
49. Lilong Zhu, Zhangqi Chen, Wei Zhong, Changdong Wei, Gemei Cai, Liang Jiang, Zhanpeng Jin, and Ji-Cheng Zhao, "Measurement of Diffusion Coefficients in the BCC Phase of the Ti-Sn and Zr-Sn Binary Systems", *Metallurgical and Materials Transactions A*, vol. 50, pp. 1409-1420, 2019. https://doi.org/10.1007/s11661-018-05107-7 or https://rdcu.be/bfNcg
50. Qiaofu Zhang, Surendra K. Makineni, John Allison, and Ji-Cheng Zhao, "Effective Evaluation of Interfacial Energy by Matching Precipitate Sizes Measured Along a Composition Gradient with Kampmann-Wagner Numerical (KWN) Modeling", *Scripta Materialia*, vol. 160, pp. 70–74, 2019. https://doi.org/10.1016/j.scriptamat.2018.09.048
51. Changdong Wei and Ji-Cheng Zhao, "Gradient Temperature Heat Treatment for Efficient Study of Phase Precipitation in a High-Temperature Fe-Cr-Mo Ferritic Steel", *Materialia*, vol. 3, pp. 31-40, 2018. https://doi.org/10.1016/j.mtla.2018.10.003
52. Zhangqi Chen and Ji-Cheng Zhao, "Recommendation for Reliable Evaluation of Diffusion Coefficients from Diffusion Profiles with Steep Concentration Gradients", *Materialia*, vol. 2, pp. 63–69, 2018. https://doi.org/10.1016/j.mtla.2018.06.011
53. Greta Lindwall, Kil-Won Moon, Zhangqi Chen, Michael Mengason, Maureen E. Williams, Justin Gorham, Ji-Cheng Zhao, and Carelyn E. Campbell, "Diffusion in the Ti-Al-V System", *Journal of Phase Equilibria and Diffusion*, vol. 39, pp. 731–746, 2018. https://doi.org/10.1007/s11669-018-0673-9
54. Brian T. Lejeune, Xinpeng Du, Radhika Barua, Ji-Cheng Zhao, Laura H. Lewis, "Anisotropic Thermal Conductivity of Magnetocaloric $AlFe_2B_2$", *Materialia*, vol. 1, pp. 150-154, 2018. https://doi.org/10.1016/j.mtla.2018.05.011
55. Gokul Vishwanathan, Julian Sculley, Adam Fischer, and Ji-Cheng Zhao, "Techno-Economic Analysis of High-Efficiency Natural-Gas Generators for Residential Combined Heat and Power", *Applied Energy*, vol. 226, pp. 1064-1075, 2018. https://doi.org/10.1016/j.apenergy.2018.06.013
56. Zhangqi Chen, Zi-Kui Liu, and Ji-Cheng Zhao, "Determination of Interdiffusion and Impurity Diffusion Coefficients in Seven Ti and Zr Binary Systems Using Diffusion

Multiples", *Metallurgical and Materials Transactions A*, vol. 49, pp. 3108–3116, 2018. https://doi.org/10.1007/s11661-018-4645-9
57. Xinpeng Du and Ji-Cheng Zhao, "First Measurement of the Full Elastic Constants of Ni-Based Superalloy René 88DT", *Scripta Materialia*, vol. 152, pp. 24-26, 2018. https://doi.org/10.1016/j.scriptamat.2018.03.044
58. Cassie Marker, Shun-Li Shang, Ji-Cheng Zhao, and Zi-Kui Liu, "Thermodynamic Description of the Ti-Mo-Nb-Ta-Zr System Implicated for Phase Stability of Ti Bio-Implant Materials", *CALPHAD*, vol. 61, pp. 72-84, 2018. https://doi.org/10.1016/j.calphad.2018.02.004
59. Lilong Zhu, Changdong Wei, Liang Jiang, Zhanpeng Jin, and Ji-Cheng Zhao, "Experimental Determination of the Phase Diagrams of the Co-Ni-X (X = W, Mo, Nb, Ta) Ternary Systems Using Diffusion Multiples", *Intermetallics*, vol. 93, pp. 20-29 (2018). https://doi.org/10.1016/j.intermet.2017.11.005
60. Cassie Marker, Shun-Li Shang, Ji-Cheng Zhao, and Zi-Kui Liu, "Effects of Alloying Elements on the Elastic Properties of BCC Ti-X Alloys from First-Principles Calculations", *Computational Materials Science*, vol. 142, pp. 215-266 (2018). https://doi.org/10.1016/j.commatsci.2017.10.016
61. Wei Zhong and Ji-Cheng Zhao, "First Reliable Diffusion Coefficients for Mg-Y and Additional Reliable Diffusion Coefficients for Mg-Sn and Mg-Zn", *Metallurgical and Materials Transactions A*, vol. 48A, pp. 5778-5782 (2017). https://doi.org/10.1007/s11661-017-4378-1
62. Cassie Marker, Shun-Li Shang, Ji-Cheng Zhao, and Zi-Kui Liu, "Elastic Knowledge Base of BCC Ti Alloys from First-Principles Calculations and CALPHAD-based Modeling", *Computational Materials Science*, vol. 140, pp. 212-139 (2017). https://doi.org/10.1016/j.commatsci.2017.08.037
63. Vinay S. Chauhan, M. Faisal Riyad, Xinpeng Du, Changdong Wei, Ji-Cheng Zhao, B. Tyburska-Püschel, and Marat Khafizov, "Thermal Conductivity Degradation and Microstructural Damage Characterization by Low Dose Irradiation using Laser based Techniques", *Metallurgical and Materials Transactions E*, vol. 4, pp. 61–69 (2017). https://doi.org/10.1007/s40553-017-0107-3
64. Xinpeng Du and Ji-Cheng Zhao, "Facile Measurement of Single-Crystal Elastic Constants from Polycrystalline Samples", *npj Computational Materials*, vol. 3, pp. 17-1–17-8 (2017). http://doi.org/10.1038/s41524-017-0019-x or https://rdcu.be/ryL6 (Open access)
65. Changdong Wei, Nikolas Antolin, Oscar D. Restrepo, Wolfgang Windl, and Ji-Cheng Zhao, "A General Model for the Thermal and Electrical Conductivity of Binary Metallic Systems", *Acta Materialia*, vol. 126, pp. 272-279 (2017). http://doi.org/10.1016/j.actamat.2016.12.047
66. Lilong Zhu, Qiaofu Zhang, Zhangqi Chen, Changdong Wei, Gemei Cai, Liang Jiang, Zhanpeng Jin, and Ji-Cheng Zhao, "Measurement of Interdiffusion and Impurity Diffusion Coefficients in the BCC Phase of the Ti-X (X = Cr, Hf, Mo, Nb, V, Zr) Binary Systems using Diffusion Multiples", *Journal of Materials Science*, vol. 52, pp. 3255-3268 (2017). http://doi.org/10.1007/s10853-016-0614-0
67. Qiaofu Zhang, Zhangqi Chen, Wei Zhong, and Ji-Cheng Zhao. "Accurate and Efficient Measurement of Impurity (Dilute) Diffusion Coefficients without Isotope Tracer Experiments", *Scripta Materialia*, vol. 128, pp. 32-35 (2017). https://doi.org/10.1016/j.scriptamat.2016.09.040.
68. Wei Zhong and Ji-Cheng Zhao, "First Experimental Measurement of Calcium Diffusion in Magnesium Using Novel Liquid-Solid Diffusion Couples and Forward-Simulation Analysis", *Scripta Materialia*, vol. 127, pp. 92–96 (2017). https://doi.org/10.1016/j.scriptamat.2016.09.008.

69. Lilong Zhu, Changdong Wei, Haiying Qi, Liang Jiang, Zhanpeng Jin, and Ji-Cheng Zhao, "Experimental Investigation of Phase Equilibria in the Cobalt-Rich Part of the Co-Al-X (X = W, Mo, Nb, Ni, Ta) Ternary Systems using Diffusion Multiples", *Journal of Alloys and Compounds*, vol. 691, pp. 110-118 (2017). https://doi.org/10.1016/j.jallcom.2016.08.210.
70. Yi Li, Bin He, Joseph P. Heremans, and Ji-Cheng Zhao. "High-Temperature Oxidation Behavior of Thermoelectric SnSe", *Journal of Alloys and Compounds*, vol. 669, pp. 224-231 (2016). https://doi.org/10.1016/j.jallcom.2016.01.258.
71. Siwei Cao and Ji-Cheng Zhao, "Determination of the Fe-Cr-Mo Phase Diagram at Intermediate Temperatures using Dual-Anneal Diffusion Multiples", *Journal of Phase Equilibria and Diffusion*, vol. 37, pp. 25-38 (2016). https://doi.org/10.1007/s11669-015-0423-1 with Erratum (pp. 39-43). (Winner of 2016 JPED Editor Choice Award)
72. Huizhen Li, Nana Ma, Wenjuan Meng, Judith Gallucci, Yongqing Qiu, Shujun Li, Qianyi Zhao, Jie Zhang, Ji-Cheng Zhao, and Xuenian Chen, "Formation Mechanisms, Structure, Solution Behavior and Reactivity of Aminodiborane", *Journal of American Chemical Society*, vol. 137, pp. 12406-12414 (2015). https://doi.org/10.1021/jacs.5b08033.
73. L.L. Zhu, H.Y. Qi, L. Jiang, Z.P. Jin, J.-C. Zhao, "Experimental Determination of the Ni-Cr-Ru Phase Diagram and Thermodynamic Reassessments of the Cr-Ru and Ni-Cr-Ru Systems", *Intermetallics*, vol. 64, pp. 86-95 (2015). https://doi.org/10.1016/j.intermet.2015.04.011.
74. Siwei Cao and Ji-Cheng Zhao, "Application of Dual-Anneal Diffusion Multiples to the Effective Study of Phase Diagrams and Phase Transformations in the Fe-Cr-Ni System", *Acta Materialia*, vol. 88, p. 196-206 (2015). https://doi.org/10.1016/j.actamat.2014.12.027.
75. Solange Vivès, Philippe Bellanger, Stéphane Gorsse, Changdong Wei, Qiaofu Zhang, and Ji-Cheng Zhao, "Combinatorial Approach Based on Interdiffusion Experiments for the Design of Thermoelectrics: Application to the $Mg_2(Si,Sn)$ Alloys", *Chemistry of Materials*, vol. 26, p. 4334-4337 (2014). http://doi.org/10.1021/cm502413t.
76. Xuenian Chen, Yi-Hsin Liu, Anne-Marie Alexander, Judith Gallucci, Hima K. Lingam, Cong Wang, Son-Jong Hwang, Umit S. Ozkan, Sheldon G. Shore, and Ji-Cheng Zhao, "Relationship Between Structure and Thermal Decomposition: Desolvation and Dehydrogenation of Solvated Magnesium Salts of Dodecahydrododecaborate", *Chemistry – A European Journal*, vol. 20, p. 7325–7333 (2014). http://doi.org/10.1002/chem.201303842.
77. Qiaofu Zhang and Ji-Cheng Zhao, "Impurity and interdiffusion coefficients of the Cr-X (X = Co, Fe, Mo, Nb, Ni, Pd, Pt, Ta) binary systems", *Journal of Alloys and Compounds*, vol. 604, p. 142-150 (2014). http://doi.org/10.1016/j.jallcom.2014.03.092.
78. Ji-Cheng Zhao, "A Perspective on the Materials Genome Initiative", *Chinese Journal of Nature* (In Chinese), vol. 36, p. 89-104 (2014). http://doi.org/10.3969/j.issn.0253-9608.2014.02.001.
79. X.D. Zhang, L.B. Liu, J.-C. Zhao, J.L. Wang, F. Zheng, and Z.P. Jin, "High-Efficiency Combinatorial Approach as an Effective Tool for Accelerating Metallic Biomaterials Research and Discovery", *Materials Science and Engineering C*, vol. 39, p. 273-280 (2014) http://doi.org/10.1016/j.msec.2014.02.039.
80. L.-N.N. Nforbi, A. Talekar, K.H. Lau, R. Chellapa, W.-M. Chien, D. Chandra, H. Hagemann, Y. Filinchuk, J.-C. Zhao, and Andre Levchenko, "Vapor Pressure Measurements of $Mg(BH_4)_2$ using Knudsen Torsion Effusion Thermographic Method," *International Journal of Hydrogen Energy*, vol. 39, p. 2175–2186 (2014). http://doi.org/10.1016/j.ijhydene.2013.11.071.
81. Ji-Cheng Zhao, "High-Throughput Experimental Tools for the Materials Genome Initiative", *Chinese Science Bulletin*, 59 (15), 1652-1661 (2014) [English version] & 58 (35), 3647-3655 (2013) [Chinese version]. http://doi.org/10.1007/s11434-014-0120-1.

82. Julie E. Barkman, Paul Carpenter, Ji-Cheng Zhao, and John J. Donovan, "Electron Microprobe Quantitative Mapping vs. Defocused Beam Analysis", *Microscopy and Microanalysis*, 19 (S2), 848-849 (2013).
83. Dongyao Li, Peng Zhao, Ji-Cheng Zhao, and David G. Cahill, "Generation and Detection of GHz Surface Acoustic Waves Using an Elastomeric Phase-Shift Mask," *Journal of Applied Physics*, vol. 114, art. 143102 (2013). http://doi.org/10.1063/1.4824101
84. Xuenian Chen, Ji-Cheng Zhao, and Sheldon G. Shore, "The Roles of Dihydrogen Bonds in Amine Borane Chemistry", *Accounts of Chemical Research*, 46, 2666–2675 (2013). http://doi.org/10.1021/ar400099g.
85. Changdong Wei, Xuan Zheng, David G. Cahill, and Ji-Cheng Zhao, "Invited Article: Micron Resolution Spatially-Resolved Measurement of Heat Capacity Using Dual-Frequency Time-Domain Thermoreflectance", *Review of Scientific Instruments*, 84, 071301 (2013) (Front-cover featured article – July 2013 issue). http://doi.org/10.1063/1.4815867.
86. Peng Zhao, Ji-Cheng Zhao, and Richard Weaver, "Dynamic Surface Acoustic Response to a Thermal Expansion Source on an Anisotropic Half Space", *Journal of the Acoustical Society of America*, vol. 133, p. 2634-2640 (2013). http://doi.org/10.1121/1.4799019.
87. Zhenguo Huang, Hima K. Lingam, Xuenian Chen, Spencer Porter, Aijun Du, Patrick M. Woodard, Sheldon G. Shore, and Ji-Cheng Zhao, "Synthesis, Structural Analysis, and Thermal Decomposition Studies of $[(NH_3)_2BH_2]B_3H_8$", *RSC Advances*, vol. 3, p. 7460-7465 (2013). http://doi.org/10.1039/C3RA22836C.
88. Ji-Cheng Zhao, Yunhui Xu, and Uwe Hartmann, "Measurement of an Iso-Curie Temperature Line of a Co-Cr-Mo Solid Solution by Magnetic Force Microscopy Imaging on a Diffusion Multiple", *Advanced Engineering Materials*, vol. 15, p. 321-324 (2013). http://doi.org/10.1002/adem.201200229.
89. Qiaofu Zhang and Ji-Cheng Zhao, "Extracting Interdiffusion Coefficients from Binary Diffusion Couples using Traditional Methods and a Forward-Simulation Method", *Intermetallics*, vol. 34, p. 132-141 (2013). http://doi.org/10.1016/j.intermet.2012.11.012
90. Zhenguo Huang, Mitch Eagles, Spencer Porter, Beau Billet, Robert L. Corey, Mark S. Conradi and Ji-Cheng Zhao, "Thermolysis and Solid State NMR Studies of NaB_3H_8, $NH_3B_3H_7$ and $NH_4B_3H_8$", *Dalton Transactions*, vol. 42, p. 701-708 (2013).
91. Xuenian Chen, Yongsheng Zhang, Yongli Wang, Douglas Knight, Wei Zhou, Teshome B. Yisgedu, Zhenguo Huang, Hima K. Lingam, Beau Billet, Terrence J. Udovic, Gilbert M. Brown, Sheldon G. Shore, Christopher Wolverton, and Ji-Cheng Zhao, "Structure Determination of an Amorphous Compound AlB_4H_{11}", *Chemical Science*, vol. 3, p. 3183-3191 (2012). https://doi.org/10.1039/C2SC21100A
92. Xuenian Chen, Xiaoguang Bao, Beau Billet, Sheldon G. Shore, and Ji-Cheng Zhao "Large-Scale and Facile Preparation of Pure Ammonia Borane through Displacement Reactions", *Chemistry – A European Journal*, vol. 18, p. 11994-11999 (2012).
93. Xuenian Chen, Judith Gallucci, Charles Campana, Zhenguo Huang, Hima Kumar Lingam, Sheldon G. Shore, and Ji-Cheng Zhao, "Anti and Gauche Conformers of an Inorganic Butane Analogue, $NH_3BH_2NH_2BH_3$", *Chemical Communications*, vol. 48, p. 7943-7945 (2012). https://doi.org/10.1039/C2CC33621A
94. Naveen Kanthamneni, Sadhana Sharma, Samantha A. Meenach, Beau Billet, Ji-Cheng Zhao, Eric M. Bachelder, and Kristy M. Ainslie, "Enhanced Stability of Horse Radish Peroxidase Encapsulated in Acetalated Dextran Microparticles Stored Outside Cold Chain Conditions", *International Journal of Pharmaceutics*, vol. 431, p. 101-110 (2012).
95. Ji-Cheng Zhao, Xuan Zheng, and David G. Cahill, "Thermal Conductivity Mapping of the Ni-Al System and the Beta-NiAl Phase in the Ni-Al-Cr System", *Scripta Materialia*, vol. 66, p. 935-938 (2012). https://doi.org/10.1016/j.scriptamat.2012.02.035

96. Hima K. Lingman, Xuenian Chen, Ji-Cheng Zhao, and Sheldon G. Shore, "A Convenient Synthesis and a NMR Study of the Diammoniate of Diborane", *Chemistry – A European Journal*, vol. 18, p. 3490-3492 (2012).
97. Teshome B. Yisgedu, Zhenguo Huang, Xuenian Chen, Hima K. Lingam, Graham King, Aaron Highley, Sean Maharrey, Patrick M. Woodward, Richard Behrens, Sheldon G. Shore, and Ji-Cheng Zhao, "The Structural Characterization of $(NH_4)_2B_{10}H_{10}$ and Thermal Decomposition Studies of $(NH_4)_2B_{10}H_{10}$ and $(NH_4)_2B_{12}H_{12}$", *International Journal of Hydrogen Energy*, vol. 37, p. 4267-4273 (2012).
98. X. Chen, X. Bao, J.-C. Zhao, and S.G. Shore, "Experimental and Computational Study of the Formation Mechanism of the Diammoniate of Diborane: The Role of Dihydrogen Bonds", *Journal of American Chemical Society*, vol. 133, p. 14172-14175 (2011). https://doi.org/10.1021/ja203648w.
99. T.B. Yisgedu, X. Chen, H.K. Lingam, Z. Huang, S. Maharrey, R. Behrens, S.G. Shore, and J.-C. Zhao, "Synthesis, Structural Characterization, and Thermal Decomposition Study of $Mg(H_2O)_6B_{10}H_{10}•4H_2O$", *Journal of Physical Chemistry C.*, vol. 115, p. 11793-11802 (2011).
100. Z. Huang, X. Chen, T. Yisgedu, J.-C. Zhao, and S.G. Shore, "High-Capacity Hydrogen Release through Hydrolysis of NaB_3H_8", *International Journal of Hydrogen Energy*, vol. 36, p. 7038-7042 (2011).
101. Z. Huang, X. Chen, T. Yisgedu, E.A. Meyer, S.G. Shore, and J.-C. Zhao, "Ammonium Octahydrotriborate ($NH_4B_3H_8$): New Synthesis, Structure and Hydrogen Storage Properties", *Inorganic Chemistry,* vol. 58, p. 3738-3742 (2011).
102. D.T. Shane, L.H. Rayhel, Z. Huang, J.-C. Zhao, X. Tang, V. Stavila, M.S. Conradi, "A Comprehensive NMR Study of Magnesium Borohydride", *Journal of Physical Chemistry C.*, vol. 115, p. 3172-3177 (2011).
103. J.-C. Zhao, X. Zheng, and D.G. Cahill, "High-Throughput Measurements of Materials Properties", *JOM*, vol. 63, No. 3, p. 40-44 (2011). https://doi.org/10.1007/s11837-011-0044-z
104. Z. Huang, G. King, X. Chen, J. Hoy, T. Yisgedu, H.K. Lingam, S.G. Shore, P.M. Woodward, and J.-C. Zhao, "A Simple and Efficient Way to Synthesize Unsolvated Sodium Octahydrotriborate", *Inorganic Chemistry*, vol. 49, p. 8185-8187 (2010).
105. X. Chen, J.-C. Zhao, and S.G. Shore, "Facile Synthesis of Aminodiborane and Inorganic Butane Analogue $NH_3BH_2NH_2BH_3$", *Journal of American Chemical Society,* vol. 132, p. 10658-10659 (2010). https://doi.org/10.1021/ja104938v
106. H.K. Lingam, X. Chen, T. Yisgedu, Z. Huang, J.-C. Zhao, and S.G. Shore, "Redetermination of Di-μ-hydrido-hexahydrido-tetrakis(tetrahydrofuran)-dialuminium(III)magnesium(II)", *Acta Crystallographica E*, vol. E66, p. m575 (2010).
107. Z. Huang, J. Gallucci, X. Chen, T. Yisgedu, H.K. Lingam, S.G. Shore, and J.-C. Zhao, "$Li_2B_{12}H_{12}•7NH_3$: A New Ammine Complex for Ammonia Storage or Indirect Hydrogen Storage", *Journal of Materials Chemistry*, vol. 20, p. 2743-2745 (2010).
108. R.J. Thompson, J.-C. Zhao, and K.J. Hemker, "Effect of Ternary Elements on Martensitic Transformation in β-NiAl", *Intermetallics*, vol. 18, p. 796-802 (2010).
109. D.G. Cahill, X. Zheng, and J.-C. Zhao, "Spatially Resolved Measurements of Thermal Stresses by Picosecond Time-Domain Probe Beam Deflection", *Journal of Thermal Stresses*, vol. 33, p. 9-14 (2010). https://doi.org/10.1080/01495730903408690
110. X. Zheng, D.G. Cahill, and J.-C. Zhao, "Effect of MeV Ion Irradiation on the Coefficient of Thermal Expansion of Fe-Ni Invar Alloys: a Combinatorial Study", *Acta Materialia*, vol. 58, p. 1236-1241 (2010).
111. X. Chen, H. K. Lingam, Z. Huang, T. Yisgedu, J.-C. Zhao, S.G. Shore, "Thermal Decomposition Behavior of Hydrated Magnesium Dodecahydrododecaborates", *Journal of Physical Chemistry Letters*, vol. 1, p. 201-204 (2010).

112. T.B. Yisgedu, X. Chen, H.K. Lingam, Z. Huang, E.A. Meyers, S.G. Shore, and J. -C. Zhao, "Intermolecular Dihydrogen and Hydrogen Bonding Interactions in Ammonium Closo-decahydro-decaborate Sesquihydrate", *Acta Crystallographica C*, vol. 66, p. m1-m3 (2010).
113. J.-C. Zhao, "A Mnemonic Scheme for Thermodynamics", *MRS Bulletin*, vol. 33, p. 92-94 (2009). https://doi.org/10.1557/mrs2009.26
114. G.L. Soloveichik, Y. Gao, J. Rijssenbeek, M. Andrus, R.C. Bowman, Jr., S.-J. Hwang, and J.-C. Zhao, "Magnesium Borohydride as a Hydrogen Storage Material: Properties of Unsolvated $Mg(BH_4)_2$", *International Journal of Hydrogen Energy*, vol. 34, p. 916-928 (2009).
115. G.L. Soloveichik, M. Andrus, Y. Gao, S. Kniajanski, and J.-C. Zhao, "Magnesium Borohydride as a Hydrogen Storage Material: Synthesis of Unsolvated $Mg(BH_4)_2$", *International Journal of Hydrogen Energy*, vol. 34, p. 2144-2152 (2009).
116. J.-C. Zhao, D.A. Knight, G.M. Brown, C. Kim, S.-J. Hwang, J.W. Reiter, R.C. Bowman Jr., J.A. Zan, and J.G. Kulleck, "Study of Aluminoborane Compound AlB_4H_{11} for Hydrogen Storage", *Journal of Physical Chemistry C.*, vol. 113, p. 2-11 (2009).
117. D.R. Snoeyenbos, D.A. Wark, and J.-C. Zhao, "Constructing Ternary Phase Diagrams Directly from EPMA Compositional Maps", *Microscopy and Microanalysis*, vol. 14, p. 1276-1277 (2008).
118. X. Zheng, D.G. Cahill, R. Weaver, and J.-C. Zhao, "Micron-Scale Measurements of the Coefficient of Thermal Expansion by Time-Domain Probe Beam Deflection", *Journal of Applied Physics*, vol. 104, 073509 (2008). https://doi.org/10.1063/1.2988111
119. G.L. Soloveichik, J.-H. Her, P.W. Stephens, Y. Gao, J. Rijssenbeek, M. Andrus, and J.-C. Zhao, "Ammine Magnesium Borohydride Complex as a New Material for Hydrogen Storage: Structure and Properties of $Mg(BH_4)_2{\cdot}2NH_3$", *Inorganic Chemistry*, vol. 47, p. 4290-4298 (2008).
120. S.-J. Hwang, R.C. Bowman, Jr., J.W. Reiter, J. Rijssenbeek, G.L. Soloveichik, J.-C. Zhao, H. Kabbour, and C.C. Ahn, "NMR Confirmation for Formation of $B_{12}H_{12}$ Complexes during Hydrogen Desorption from Metal Borohydrides", *Journal of Physical Chemistry C.*, vol. 112, p. 3164-3168 (2008).
121. J.-H. Her, P.W. Stephens, Y. Gao, G.L. Soloveichik, J. Rijssenbeek, M. Andrus, and J.-C. Zhao, "Structure of Unsolvated Magnesium Borohydride $Mg(BH_4)_2$", *Acta Crystallographica B*, vol. B63, p. 561-568 (2007).
122. X. Zheng, D.G. Cahill, P. Krasnochtchekov, R.S. Averback, and J.-C. Zhao, "High-Throughput Thermal Conductivity Measurements of Nickel Solid Solutions and the Applicability of the Wiedemann-Franz Law", *Acta Materialia*, vol. 55, p. 5177-5185 (2007).
123. J.-C. Zhao, "Combinatorial Approaches as Effective Tools in the Study of Phase Diagrams and Composition-Structure-Property Relationships", *Progress in Materials Science*, vol. 51, p. 557-631 (2006). https://doi.org/10.1016/j.pmatsci.2005.10.001
124. J.-C. Zhao, "The Diffusion-Multiple Approach to Designing Alloys", *Annual Review of Materials Research*, vol. 35, p. 51-73 (2005). https://doi.org/10.1146/annurev.matsci.35.100303.111314
125. C. E. Campbell, J.-C. Zhao, and M. F. Henry, "Examination of Ni-base Superalloy Diffusion Couples Containing Multiphase Regions", *Materials Science and Engineering A.*, vol. 407, p. 135-146 (2005).
126. J.-C. Zhao, X. Zheng and D.G. Cahill, "High-Throughput Diffusion Multiples", *Materials Today*, vol. 8, p. 28-37 (2005). https://doi.org/10.1016/S1369-7021(05)71122-6
127. X.M. Pan, Z.P. Jin, and J.-C. Zhao, "Determination of the Isothermal Sections of the Al-Ni-Si Ternary System at 750°C and 850°C", *Metallurgical and Materials Transactions*, vol. 36A, p. 1757-1767 (2005).

128. X. Zheng, D.G. Cahill, and J.-C. Zhao, "Thermal Conductivity Imaging of Thermal Barrier Coatings", *Advanced Engineering Materials*, vol. 7, p. 622-626 (2005). (Front-cover featured article)
129. J.-C. Zhao, "Reliability of the Diffusion-Multiple Approach for Phase Diagram Mapping", *Journal of Materials Science*, vol. 39, p. 3913-3925 (2004).
130. J.-C. Zhao, M.R. Jackson, and L.A. Peluso, "Mapping of the Nb-Cr-Ti Phase Diagram Using Diffusion Multiples", *Zeitschrift für Metallkunde*, vol. 95, p. 142-146 (2004).
131. S. Huxtable, D.G. Cahill, V. Fauconnier, J.O. White, and J.-C. Zhao, "Thermal Conductivity Imaging at Micrometre-Scale Resolution for Combinatorial Studies of Materials", *Nature Materials*, vol. 3, p. 298-301 (2004). https://doi.org/10.1038/nmat1114
132. J.-C. Zhao, M.R. Jackson, and L.A. Peluso, "Evaluation of Phase Relations in the Nb-Cr-Al System at 1000°C Using a Diffusion-Multiple Approach", *Journal of Phase Equilibria and Diffusion*, vol. 25, p. 152-159 (2004). https://doi.org/10.1007/s11669-004-0008-x
133. J.-C. Zhao, M.R. Jackson, and L.A. Peluso, "Mapping of the Nb-Ti-Si Phase Diagram Using Diffusion Multiples", *Materials Science and Engineering A.*, vol. 372, p. 21-27 (2004).
134. C.E. Campbell, J.-C. Zhao, and M.F. Henry, "Comparison of Experimental and Simulated Multicomponent Ni-base Superalloy Diffusion Couples", *Journal of Phase Equilibria and Diffusion*, vol. 25, p. 6-15 (2004).
135. J.-C. Zhao, M.R. Jackson, and L.A. Peluso, "Determination of the Nb-Cr-Si Phase Diagram Using Diffusion Multiples", *Acta Materialia*, vol 51, p. 6395-6405 (2003). https://doi.org/10.1016/j.actamat.2003.08.007
136. B.P. Bewlay, M.R. Jackson, J.-C. Zhao, and P.R. Subramanian, "A Review of Very High-Temperature Nb-Silicide Composites", *Metallurgical and Materials Transactions*, vol. 34A, p. 2043-2052 (2003). https://doi.org/10.1007/s11661-003-0269-8
137. J.-C. Zhao, M.R. Jackson, L.A. Peluso, and L. Tan, "Phase Diagram of the Nb-Al-Si Ternary System", *Journal of Alloys and Compounds*, vol. 360, p. 183-188 (2003). https://doi.org/10.1016/S0925-8388(03)00524-3
138. B.P. Bewlay, M.R. Jackson, J.-C. Zhao, P.R. Subramanian, M.G. Mendiratta, and J.J. Lewandowski, "Ultrahigh-Temperature Nb-Silicide-Based Composites", *MRS Bulletin*, vol. 28, p. 646-653 (2003). https://doi.org/10.1557/mrs2003.192
139. J.-C. Zhao and J.H. Westbrook, "Ultrahigh Temperature Materials for Jet Engines", *MRS Bulletin*, vol. 28, no. 9, p. 622-630 (2003). (Front-cover featured article) https://doi.org/10.1557/mrs2003.189
140. Y. Yang, Y.A. Chang, J.-C. Zhao, and B.P. Bewlay, "Thermodynamic Modeling of the Nb-Hf-Si Ternary System", *Intermetallics*, vol. 11, p. 407-415 (2003).
141. T. Wang, Z. Jin, and J.-C. Zhao, "Thermodynamic Assessment of the Al-Hf Binary System", *Journal of Phase Equilibria*, vol. 23, p. 416-423 (2002).
142. J.-C. Zhao and M.F. Henry, "The Thermodynamic Prediction of Phase Stability in Multicomponent Superalloys", *JOM*, vol. 54, no. 1, p.37-41 (2002).
143. J.-C. Zhao, M.R. Jackson, L.A. Peluso, and L. Brewer, "A Diffusion Multiple Approach for Accelerated Design of Structural Materials", *MRS Bulletin*, vol. 27, p. 324-329 (2002). (Front-cover featured article)
144. E.J. Amis, X.-D. Xiang, and J.-C. Zhao, "Combinatorial Materials Science: What's New Since Edison?", *MRS Bulletin*, vol. 27, p. 295-297 (2002).
145. J.-C. Zhao, M.R. Jackson, L.A. Peluso, and L. Brewer, "A Diffusion-Multiple Approach for Mapping of Phase Diagrams, Hardness, and Elastic Modulus", *JOM*, vol. 54, no. 7, p. 42-45 (2002).
146. J.-C. Zhao and M.F. Henry, "CALPHAD - Is It Ready for Superalloy Design?" *Advanced Engineering Materials*, vol. 4, p. 501-508 (2002). https://doi.org/10.1002/1527-2648(20020717)4:7<501::AID-ADEM501>3.0.CO;2-3

147. T. Wang, Z. Jin, and J.-C. Zhao, "Experimental Study and Reassessment of the Ni-Hf Binary System", *Zeitschrift für Metallkunde*, vol. 92, p. 441-446 (2001).
148. T. Wang, Z. Jin, and J.-C. Zhao, "Thermodynamic Assessment of the Al-Zr Binary System", *Journal of Phase Equilibria*, vol. 22, p. 544-551 (2001).
149. J.-C. Zhao, B.P. Bewlay, and M.R. Jackson, "Determination of Nb-Hf-Si Phase Equilibria", *Intermetallics,* vol. 9, p. 681-689 (2001).
150. J.-C. Zhao, V. Ravikumar, and A.M. Beltran, "Phase Precipitation and Phase Stability in Nimonic 263", *Metallurgical and Materials Transactions A.*, vol. 32A, p. 1271-1282 (2001). http://doi.org/10.1007/s11661-001-0217-4
151. J.-C. Zhao, "A Combinatorial Approach for Efficient Mapping of Phase Diagrams and Properties", *Journal of Materials Research*, vol.16, p. 1565-1578 (2001).
152. J.-C. Zhao, "A Combinatorial Approach for Structural Materials", *Advanced Engineering Materials*, vol. 3, p. 143-147 (2001). http://doi.org/10.1002/1527-2648(200103)3:3<143::AID-ADEM143>3.0.CO;2-F (Front-cover featured article)
153. J.-C. Zhao, M. Larsen, and V. Ravikumar, "Phase Precipitation and Time-Temperature-Transformation Diagram of Hastelloy X", *Materials Science and Engineering A.*, vol. 293, p. 112-119 (2000). http://doi.org/10.1016/S0921-5093(00)01049-2
154. J.-C. Zhao, B.P. Bewlay, M.R. Jackson, and Q. Chen, "Hf-Si Binary Phase Diagram Determination and Thermodynamic Modeling", *Journal of Phase Equilibria,* vol. 21, p. 40-46 (2000). http://doi.org/10.1361/105497100770340408
155. J.-C. Zhao, "The FCC/HCP Phase Equilibria and Phase Transformation in Cobalt-based Binary Systems", *Zeitschrift für Metallkunde*, vol. 90, p. 223-232 (1999).
156. J.-C. Zhao and M.R. Notis, "Ordering Transformation and Spinodal Decomposition in Au-Ni Alloys", *Metallurgical and Materials Transactions A.*, vol. 30A, p.707-716 (1999). http://doi.org/10.1007/s11661-999-0062-4
157. J.-C. Zhao and M.R. Notis, "Microstructure and Precipitation Kinetics in a Cu-7.5Ni-5Sn Alloy", *Scripta Materialia*, vol. 39, p. 1509-1516 (1998). http://doi.org/10.1016/S1359-6462(98)00341-8
158. J.-C. Zhao and M.R. Notis, "Spinodal Decomposition, Ordering Transformation, and Discontinuous Precipitation in a Cu-15Ni-8Sn Alloy", *Acta Materialia*, vol. 46, p. 4203-4218 (1998). http://doi.org/10.1016/S1359-6454(98)00095-0
159. J.-C. Zhao and M.R. Notis, "Continuous Cooling Transformation Kinetics versus Isothermal Transformation Kinetics of Steels: A Phenomenological Rationalization of Experimental Observations", *Materials Science and Engineering R.*, vol. 15, p.135-208 (1995). (Single issue review article) https://doi.org/10.1016/0927-796X(95)00183-2
160. J.-C. Zhao and M.R. Notis, "Kinetics of the FCC to HCP Phase Transformation and the Formation of Martensite in Pure Cobalt", *Scripta Metallurgica et Materialia*, vol. 32, p. 1671-1676 (1995).
161. J.-C. Zhao and M.R. Notis, "Phase Transformation Kinetics and the Assessment of Equilibrium and Metastable States", *Journal of Phase Equilibria*, vol. 14, p. 303-315 (1993).
162. J.-C. Zhao and Z.P. Jin, "Isothermal Decomposition of Supercooled Austenite in Steels", *Materials Science and Technology*, vol. 8, p. 1004-1010 (1992).
163. J.-C. Zhao, "Continuous Cooling Transformations in Steels", *Materials Science and Technology*, vol. 8, p. 997-1003 (1992).
164. J.-C. Zhao and Z.P. Jin, "Determination of Phase Equilibria in the Ti-Fe-Co System at 900 °C", *Zeitschrift für Metallkunde*, vol. 81, p. 247-250 (1990).
165. J.-C. Zhao and Z.P. Jin**,** "Thermodynamics of the Massive, Bainitic and Martensitic Transformations in Fe-C, Fe-Ni, Fe-Cr and Fe-Cu Alloys", *Acta Metallurgica et Materialia*, vol. 38, p. 425-431 (1990).

166. J.-C. Zhao, Z.P. Jin and P.Y. Huang, "Diffusion Quadruples for the Determination of Quaternary Phase Diagrams Applied to Fe-Co-Ni-Cr System", *Scripta Metallurgica*, vol. 22, p. 1825-1829 (1988).

d) Editor Reviewed Journal Articles, Short Entries, and Encyclopedia Entry

167. J.-C. Zhao, Y. Du, and Q. Chen, "Celebrating the 80th Birthday of Professor Zhanpeng Jin", *Journal of Phase Equilibria and Diffusion*, vol. 39, p. 455 (2018). https://doi.org/10.1007/s11669-018-0678-4
168. M.C. Gao, J.-C. Zhao, and J.E. Morral, "The Thermodynamics and Kinetics of High-Entropy Alloys", *Journal of Phase Equilibria and Diffusion*, vol. 38, p. 351-352 (2017). https://doi.org/10.1007/s11669-017-0584-1
169. Alan A. Luo, Weihua Sun, Wei Zhong, and Ji-Cheng Zhao, "Computational Thermodynamics and Kinetics for Magnesium Alloy Development", *Advanced Materials and Processes*, Vol. 173, no. 1, p. 26-30 (2015).
170. J.-C. Zhao, "Editorial: Digital Physical Property Data for the Materials Genome Initiative", *Journal of Phase Equilibria and Diffusion*, vol. 33, p. 258-259 (2012).
171. J. Simmons and J.-C. Zhao, "Large Dataset Generation, Integration and Simulation in Materials Science (Part II)", *JOM*, vol. 63, No. 7, p. 40 (2011).
172. J. Simmons and J.-C. Zhao, "Large Dataset Generation, Integration and Simulation in Materials Science (Part I)", *JOM*, vol. 63, No. 3, p. 24 (2011).
173. J.-C. Zhao, Y. Du, and Q. Chen, "Editorial", *Journal of Phase Equilibria and Diffusion*, vol. 30, no. 5, p. 417 (2009).
174. J.-C. Zhao, "Editorial", *Journal of Phase Equilibria and Diffusion*, vol. 29, no. 2, p. 129-130 (2008).
175. J.-C. Zhao, "Editorial", *Journal of Phase Equilibria and Diffusion*, vol. 26, no. 2, p. 106-107 (2005).
176. J.-C. Zhao, Book Review of "Introduction to the Thermodynamics of Materials" by D.R. Gaskell (Taylor & Francis, New York, 2003), *MRS Bulletin*, vol. 29, no. 12, p. 975 (2004).
177. J.H. Westbrook, R.C. DeVries, R.L. Fleischer, W.B. Hillig, R.P. Kambour, P.R.L. Malenfant, and J.-C. Zhao, Book Review of "Encyclopedia of Materials: Science and Technology" by K.H.J. Buschow, R.W. Cahn, M.C. Flemings, E.J. Kramer, S. Mahajan, and P. Veyssiere (Elsevier Science Ltd. 2004), *MRS Bulletin*, vol. 29, p. 512-513 (2004).
178. J.-C. Zhao, "Diffusion Multiple Screening: Phase Diagram Determination and Related Studies", *Encyclopedia of Materials: Science and Technology-Updates*, Edited by K.H.J. Buschow, R.W. Cahn, M.C. Flemings, E.J. Kramer, S. Mahajan, and P. Veyssiere (Elsevier Science Ltd. 2005).

e) Peer-Reviewed Papers in Proceedings

179. Min Zou, Wendao Li, Longfei Li, Ji-Cheng Zhao, and Qiang Feng, "Machine Learning Assisted Design Approach for Developing γ′-Strengthened Co-Ni-Base Superalloys", in *Superalloys 2020* (Proceedings of the International Symposium on Superalloys), TMS, Warrendale, PA, 2020.
180. A. Sawant, S. Tin and J.-C. Zhao, "High Temperature Nanoindentation of Ni-base Superalloys", in *Superalloys 2008* (Proceedings of the International Symposium on Superalloys), TMS, Warrendale, PA, 2008, p. 863-871.
181. J.-C. Zhao and M.F. Henry, "Reliability of Current Thermodynamic Data in Predicting Phase Stability of Superalloys", in *Materials Design Approaches and Experiences* (J.-C. Zhao, M. Fahrmann and T.M. Pollock, eds.), TMS, Warrendale, PA, 2001, p. 41-55.
182. S.J. Balsone, B.P. Bewlay, M.R. Jackson, P.R. Subramanian, J.-C. Zhao, A. Chatterjee, and T. Heffernan, "Materials Beyond Superalloys - Exploiting High-Temperature Composites", in *Structural Intermetallics 2001* (K. Hemker, D.M. Dimiduk, H. Clemens, R. Darolia, H.

Inui, J.M. Larsen, V.K. Sikka, M. Thomas, and J.D. Whittenberger, eds.), TMS, Warrendale, PA, 2001, p. 99-108.

183. J.-C. Zhao, B.P. Bewlay, M.R. Jackson, and L.A. Peluso, "Alloying and Phase Stability in Niobium Silicide In-Situ Composites", in *Structural Intermetallics 2001* (K. Hemker, D.M. Dimiduk, H. Clemens, R. Darolia, H. Inui, J.M. Larsen, V.K. Sikka, M. Thomas, and J.D. Whittenberger, eds.), TMS, Warrendale, PA, 2001, p. 483-491.
184. B.P. Bewlay, J.-C. Zhao, M.R. Jackson, and R.R. Bishop, "Determination of the Effect of Hf Additions on Phase Stability in Nb-Silicide Based In-situ Composites", *Materials Research Society Symposium Proceedings*, vol. 552 (High Temperature Ordered Intermetallic Alloys VIII), 1999, p. KK6.8.1- KK6.8.6.
185. J. Bruley, A.D. Westwood, R.A. Youngman, J.-C. Zhao and M.R. Notis, "SREELS Analysis of Oxygen-Rich Inversion Domain Boundaries in Aluminum Nitride", *Materials Research Society Symposium Proceedings*, vol. 357, p. 265-269 (1995).
186. J.-C. Zhao, M.R. Notis and H. Tsubakino, "Spinodal Decomposition and Ordering Transformation in a Cu-15Ni-8Sn Alloy", in *Solid-Solid Phase Transformations* (W.C. Johnson, J.M. Howe, D.E. Laughlin and W.A. Soffa, eds.), TMS, p. 329-334 (1994).

Awarded Patents:

1. J.-C. Zhao, "Method and Process of Producing Ammonia from Methane Hydrate", **US Patent 11,072,536**: July 27, 2021.
2. G.L. Soloveichik, J. P. Lemmon, and J.-C. Zhao, "Primary Aluminum Hydride Battery", **US Patent 8,304,121**: November 6, 2012.
3. M.R. Jackson, B.P. Bewlay, J.S. Marte, P.R. Subramanian, J.-C. Zhao, and A.M. Ritter, "High-Temperature Composite Articles and Associated Methods of Manufacture", **US Patent 8,153,052**: April 10, 2012.
4. G.L. Soloveichik and J.-C. Zhao, "Methods for Preparing Compositions which Comprise Magnesium Borohydride, and Related Materials", **US Patent 7,906,092**: March 15, 2011.
5. G.L. Soloveichik and J.-C. Zhao, "Hydrogen Storage Material and Related System", **US Patent 7,901,491**: March 8, 2011.
6. J.-C. Zhao and J.P. Lemmon, "Material for Storage and Production of Hydrogen, and Related Methods and Apparatus", **US Patent 7,833,473**: November 16, 2010.
7. M.R. Jackosn, L. Jiang, J.-C. Zhao, and C.U. Hardwicke, "Method for Repairing High Temperature Articles", **US Patent 7,722,729**: May 25, 2010.
8. L. Jiang, L.B. Kool, M.R. Jackson, C.U. Hardwicke, J.-C. Zhao, A.M. Ritter, C.-P. Lee, "Methods and Devices for Evaluating the Thermal Exposure of a Metal Article", **US Patent 7,654,734**: February 2, 2010.
9. J.-C. Zhao, M.R. Jackson, and B.P. Bewlay, "Oxidation Resistant Coatings for Molybdenum Silicide-Based Composite Articles", **US Patent 7,622,150**: November 24, 2009.
10. M.R. Jackson, L. Jiang, J.-C. Zhao, and C.U. Hardwicke, "High Temperature Alloys, and Articles Made and Repaired Therewith", **US Patent 7,494,619**: February 24, 2009.
11. J.P. Lemmon, J.-C. Zhao, T.M. Jordan, V.S. Smentkowski, "Methods for Synthesis and Evaluation of Hydrogen Storage Compositions", **US Patent 7,445,937**: November 4, 2008.
12. J.-C. Zhao and M.R. Jackson, "Combinatorial Production of Material Compositions from a Single Sample", **US Patent 7,392,927**: July 1, 2008.
13. G.L. Soloveichik and J.-C. Zhao, "Method for Manufacturing Magnesium Borohydride", **US Patent 7,381,390**: June 3, 2008.
14. M.R. Jackson, P.R. Subramanian, J.-C. Zhao, and B.P. Bewlay, R. Darolia, and R.E. Schafrik, "Turbine Blade for Extreme Temperature Conditions", **US Patent 7,189,459**: March 13, 2006.
15. J.-C. Zhao and J.P. Lemmon, "Hydrogen Storage Compositions and Methods of Manufacture Thereof", **US Patent 7,115,247**: October 3, 2006.

16. J.-C. Zhao and J.P. Lemmon, "Hydrogen Storage Compositions and Methods of Manufacture Thereof", **US Patent 7,115,246**: October 3, 2006.
17. J.-C. Zhao and J.P. Lemmon, "Hydrogen Storage Compositions and Methods of Manufacture Thereof", **US Patent 7,115,245**: October 3, 2006.
18. J.-C. Zhao and J.P. Lemmon, "Hydrogen Storage Compositions and Methods of Manufacture Thereof", **US Patent 7,115,244**: October 3, 2006.
19. R. Darolia, M. Gorman, M.R. Jackson, and J.-C. Zhao, "Protective Coating for Turbine Engine Component", **US Patent 6,974,636**: December 13, 2005.
20. J.-C. Zhao and D.M. Lipkin, "High-Temperature Articles and Method for Making", **US Patent 6,964,791**: November 15, 2005.
21. J.-C. Zhao, J.A. Pfaendtner, C. Govern, and M.R. Jackson, "Ni-base Superalloy Having a Coating System Containing a Diffusion Barrier Layer", **US Patent 6,921,586**: July 26, 2005.
22. M.R. Jackson, B.P. Bewlay, and J.-C. Zhao, "Niobium-Silicide Based Composites Resistant to High Temperature Oxidation", **US Patent 6,913,655**: July 5, 2005.
23. J.-C. Zhao and M.R. Jackson, "Article for High Temperature Service and Method for Manufacture", **US Patent 6,861,157**: March 1, 2005.
24. B.P. Bewlay, M.R. Jackson and J.-C. Zhao, "Coatings, Method of Manufacture, and the Articles Derived Therefrom" **US Patent 6,767,653**: July 27, 2004.
25. J.-C. Zhao and D.M. Lipkin, "High-Temperature Articles and Method for Making", **US Patent 6,746,783**: June 8, 2004.
26. J.-C. Zhao and M.R. Jackson, "Diffusion Barrier Coatings, and Related Articles and Processes", **US Patent 6,746,782**: June 8, 2004.
27. J.-C. Zhao, L. Jiang, M.R. Jackson, R. Darolia, and R.E. Schafrik, "Hybrid High Temperature Articles and Method of Making", **US Patent 6,726,444**: April 27, 2004.
28. J.-C. Zhao, M.R. Jackson, R.J. Grylls, and R. Darolia, "Materials for Protection of Substrates at High Temperature, Articles Made Therefrom, and Method for Protecting Substrates", **US Patent 6,720,088**: April 13, 2004.
29. J.-C. Zhao, M.R. Jackson, and B.P. Bewlay, "Oxidation Resistant Coatings for Niobium-Based Silicide Composites", **US Patent 6,645,560**: November 11, 2003.
30. J.-C. Zhao, J.A. Ruud, J.J. Tiemann, J.E. Tkaczyk, A.M. Ritter, and M.R. Jackson, "Smart Coating System With Chemical Taggants for Coating Condition Assessment", **US Patent 6,644,917**: November 11, 2003.
31. C.-P. Lee, M.R. Jackson, S. Ferrigno, and J.-C. Zhao, "Foil Formed Cooling Area Enhancement" **US Patent 6,640,546**: November 4, 2003.
32. J.-C. Zhao, M.R. Jackson, and B.P. Bewlay, "Bonded Niobium Silicide and Molybdenum Silicide Composite Articles Using Brazes" **US Patent 6,607,847**: August 19, 2003.
33. M.R. Jackson, B.P. Bewlay, and J.-C. Zhao, "Bonded Niobium Silicide and Molybdenum Silicide Composite Articles Using Semi-Solid Brazes" **US Patent 6,586,118**: July 1, 2003.
34. M.R. Jackson, C.U. Hardwicke, J.-C. Zhao, and C. Mukira, "High-Temperature Alloy and Articles Made Therefrom", **US Patent 6,582,534**: June 24, 2003.
35. B.P. Bewlay, M.R. Jackson, and J.-C. Zhao, "Bonded Niobium Silicide and Molybdenum Silicide Composite Articles and Method of Manufacture" **US Patent 6,565,990**: May 20, 2003.
36. J.-C. Zhao, M.R. Jackson, and B.P. Bewlay, "Bonded Niobium Silicide and Molybdenum Silicide Composite Articles Using Germanium and Silicon Based Brazes" **US Patent 6,565,989**: May 20, 2003.
37. M.R. Jackson, C.U. Hardwicke, J.-C. Zhao, and C. Mukira, "High-Temperature Alloy and Articles Made Therefrom", **US Patent 6,554,920**: April 29, 2003.
38. J.-C. Zhao, M.R. Jackson, and B.P. Bewlay, "Oxidation Resistant Coatings for Niobium-Based Silicide Composites", **US Patent 6,521,356**: February 18, 2003.

39. J.-C. Zhao, B.P. Bewlay, and M.R. Jackson, "Oxidation Resistant Coatings for Molybdenum Silicide-Based Composite Articles", **US Patent 6,497,968**: December 24, 2002.
40. J.-C. Zhao, M.R. Jackson, and R. Darolia, "Oxidation-Resistant Coatings, and Related Articles and Processes", **US Patent 6,475,642**: November 5, 2002.
41. M.R. Jackson, B.P. Bewlay, J.-C. Zhao, and R.R. Corderman, "Nb-Based Silicide Composite Compositions", **US Patent 6,428,910**: August 6, 2002.
42. M.R. Jackson, B.P. Bewlay, and J.-C. Zhao, "Niobium-Silicide Based Composites Resistant to Low Temperature Pesting", **US Patent 6,419,765**: July 16, 2002.
43. J.-C. Zhao and Y.C. Lau, "Protective Coatings for Turbine Combustion Components", **US Patent 6,393,828**: May 28, 2002.
44. J.-C. Zhao, P.L. Dupree, M.R. Jackson, and J.R. Dobbs, "Method of Forming Hollow Channels within a Component", **US Patent 6,321,499**: November 27, 2001.
45. I.T. Spitsberg, R. Darolia, M.R. Jackson, J.-C. Zhao, and J.C. Schaeffer "Diffusion Barrier Layer", **US Patent 6,306,524**: October 23, 2001.
46. M.R. Jackson, A.M. Ritter, M.F.X. Gigliotti, and J.-C. Zhao, "Continuously-Graded Bond Coat and Method of Manufacture", **US Patent 6,287,644**: September 11, 2001.
47. M.F.X. Gigliotti, S.-C. Huang, R.J. Petterson, and J.-C. Zhao, "Liquid Metal Cooled Directional Solidification Process" **US Patent 6,276,433**: August 21, 2001.
48. S.-C. Huang, P.H. Monaghan, J.-C. Zhao, and M.F.X. Gigliotti, "Unidirectionally Solidified Cast Article and Method of Making" **US Patent 6,217,286**: April 17, 2001.
49. J.-C. Zhao and M.R. Jackson, "Nickel-Base Sigma-Gamma In-situ Intermetallic Matrix Composites" **US Patent 5,858,558**: January 12, 1999.