

Ming Tang

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• [Linkedin](#) • [Google Scholar](#) • [GitHub](#) • Portfolio: <https://tangming2008.github.io/>

Highlights

- Specialized in metallurgical failure analysis, machine learning, and metal additive manufacturing
- 10-year experience research in metals, including aluminum, iron & steel, titanium, and nickel
- Strong academic record with 7 first-author peer-reviewed journal articles and > 1000 citations

Education

Ph.D.	Materials Science & Engineering	Carnegie Mellon University, Pittsburgh, PA	May 2017
MS	Materials Science & Engineering	Carnegie Mellon University, Pittsburgh, PA	Dec 2013
BS	Materials Science & Engineering	Beihang University, Beijing, P. R. China	Jun 2012

Research Experience (Selected)

Improving Process Reliability and Product Quality in Steelmaking Mar 2018 - Present
Research Engineer, ArcelorMittal Global R&D

- Managed the steel cleanliness characterization facility in support for product development, root cause analysis, and quality evaluation
- Led projects on R&D fundamental steelmaking research to sustain new AHSS product manufacturability for the automotive customers, such as Tesla, Toyota, Nissan, and GM
- Provided technical support to steelmaking operations to optimize the reliability of steelmaking process and minimize residual defects in the product
- Co-chaired and organized the annual North America Innovation Awards (highest internal technical award)

Microstructure, Defect, and Fatigue of 3D-printed Metallic Parts Aug 2014 - May 2017
Research Assistant, Carnegie Mellon University

- Discovered the oxide-induced porosity as a novel type of defect which dominates the fatigue performance of additively manufactured aluminum alloy
- Developed a 3D geometrical model (implemented in Excel and Python) which improves the volumetric build rate by 50% and correctly predicted the residual porosity in the products
- Evaluated residual porosity with 2D metallography and 3D synchrotron-based X-ray microtomography and successfully predicted the fatigue life by statistical analysis on porosity
- Collaborated closely with researchers in the Department of Mechanical Engineering and industrial partners from Arconic on fatigue, tension, and compression tests

Oxidation of Magnetite Pellets Aug 2012 - Dec 2013
Research Assistant, Carnegie Mellon University

- Designed and performed experiments to evaluate the effect of processing variables (heating rate, peak temperature, %H₂O, and %O₂) and particle size distribution on magnetite oxidation
- Utilized the oxygen enrichment at the initial reaction stage, increased the pellet strength by 75% and successfully met the strength requirement listed by blast furnace operators
- Built a mathematical model based on chemical reactions and validated the model by designing experiments and evaluating the effect of processing variables

Educational activities

Trainer for a course on liquid steel processing, ArcelorMittal R&D Oct 2019 - present

- Designed a bi-annual training lecture on liquid steel processing for 25 steelmaking professionals
- Received an overall rating of 3.91 out of 4 (ranked #1 of all 10 instructors in the course)

Teaching Assistant for 5 graduate courses, Carnegie Mellon University Aug 2014 - Aug 2016

- Courses include: Thermodynamics, Kinetics of Metallurgical Reactions and Processes, Solidification Processing, Process Design
- Coached lab projects, graded assignments, and provided feedback

Selected Publications (> 1000 citations; [Google Scholar](#))

1. S. Yang, A. Rebmann, M. Tang, R. Moravec, D. Behrmann, M. Baird, W. Bequette, "Process monitoring using causal graphical models, with application to clogging detection in steel continuous casting," *J. Process Control*, vol. 105, pp. 259-266, 2021, doi: [10.1016/j.jprocont.2021.08.006](https://doi.org/10.1016/j.jprocont.2021.08.006)
2. M. Tang and P. C. Pistorius, "Fatigue Life Prediction for AlSi10Mg Parts Produced by Selective Laser Melting," *Int. J. Fatigue*, vol. 125, pp. 479-490, 2019. doi: [10.1016/j.ijfatigue.2019.04.015](https://doi.org/10.1016/j.ijfatigue.2019.04.015)
3. M. Tang and P. C. Pistorius, C. Montgomery, J. Beuth, "Build Rate Optimization for Powder Bed Fusion," *J. Mater. Eng. Perform.*, vol. 28, pp. 641-647, 2019. doi: [10.1007/s11665-018-3647-5](https://doi.org/10.1007/s11665-018-3647-5)
4. M. Tang and P. C. Pistorius, "Anisotropic Mechanical Behavior of AlSi10Mg Parts Produced by Selective Laser Melting," *JOM*, vol. 69, pp. 516-522, 2017. doi: [10.1007/s11837-016-2230-5](https://doi.org/10.1007/s11837-016-2230-5)
5. M. Tang, P. C. Pistorius, and J.L. Beuth, "Prediction of Lack-of-fusion Porosity for Powder Bed Fusion," *Addit. Manuf.*, vol. 14, pp. 39-48, 2017. doi: [10.1016/j.addma.2016.12.001](https://doi.org/10.1016/j.addma.2016.12.001)
6. M. Tang and P. C. Pistorius, "Oxide, Porosity and Fatigue performance of AlSi10Mg Parts Produced by Selective Laser Melting," *Int. J. Fatigue*, vol. 94, pp. 192-201, 2017. doi: [10.1016/j.ijfatigue.2016.06.002](https://doi.org/10.1016/j.ijfatigue.2016.06.002)
7. M. Tang, P. C. Pistorius, S. Narra, and J.L. Beuth, "Rapid Solidification: Selective Laser Melting of AlSi10Mg," *JOM*, vol. 68, pp. 960-966, 2016. doi: [10.1007/s11837-015-1763-3](https://doi.org/10.1007/s11837-015-1763-3)
8. M. Tang, H. J. Cho, and P. C. Pistorius, "Early Gaseous Oxygen Enrichment to Enhance Magnetite Pellet Oxidation," *Metall. Mater. Trans. B*, vol. 45, pp. 1304-1314, 2014. doi: [10.1007/s11663-014-0064-5](https://doi.org/10.1007/s11663-014-0064-5)

Conference Presentations

1. M. Tang and P. C. Pistorius, "Fatigue Life Prediction for AlSi10Mg Parts Produced by Selective Laser Melting," *RAPID + TCT Conference*, Pittsburgh, PA, May 2017.
2. M. Tang and P. C. Pistorius, "Anisotropic Mechanical Behavior of AlSi10Mg Parts Produced by Selective Laser Melting," *TMS*, San Diego, CA, Mar 2017.
3. M. Tang and P. C. Pistorius, "Relationship between Porosity Size and Fatigue Life Distributions of AlSi10Mg Parts Produced by Selective Laser Melting," *MS&T*, Salt Lake City, UT, 2016.
4. M. Tang, P. C. Pistorius, "Oxide, Porosity and Fatigue Performance of AlSi10Mg Parts Produced by Selective Laser Melting," *TMS*, Nashville, TN, 2016.
5. M. Tang, P. C. Pistorius, and J.L. Beuth, "Geometric Model to Predict Porosity of Part Produced in Powder Bed System," *MS&T*, Columbus, OH, 2015.
6. M. Tang and P. C. Pistorius, "Magnetite Pellet Oxidation: Effects of Water Vapor and Non-isothermal Reaction," *AISTech*, Indianapolis, IN, 2014.

Reviewers

- AISTech Transactions (Key reviewer)
- Materials Science and Engineering A (Outstanding reviewer)
- Journal of Materials Processing Technology (Outstanding reviewer)
- Materials & Design
- International Journal of Fatigue
- Metallurgical and Materials Transactions B
- JOM
- Journal of Alloy and Compounds
- Ironmaking and Steelmaking: Processes, Products and Applications