

MD. IRFANUL HAQUE SIDDIQUI (Irfan)

Assistant Professor

Department of Mechanical Engineering

King Saud University, Riyadh, Saudi Arabia

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Research Profile: www.irfansid.com



AREAS OF RESEARCH INTEREST

- Ironmaking & Steelmaking • Process Metallurgy • Continuous Casting • Modelling & Simulation • Interfacial/ Surface Tension • Liquid Metal 3d printing •

EDUCATION

Sept. 2016	Ph.D. (Mechanical Engineering) <i>Indian Institute of Technology Roorkee, India</i>
July 2011	Master of Technology (Mechanical Engineering) Specialization in Production & Industrial System <i>Indian Institute of Technology Roorkee, India</i>
June 2009	Bachelor of Technology (Mechanical Engineering) <i>Aligarh Muslim University, Aligarh, India</i>
June 2005	Diploma in Engineering (Mechanical Engineering) <i>Aligarh Muslim University, Aligarh, India</i>

PUBLICATIONS (Appendix I)

- **Total: 31**, (Including: 8 Journals and 23 conferences).
- Few manuscripts are under process.
- **Ph. D. Thesis:** Investigation on grade intermixing in tundish during ladle change over.
- **M. Tech. Thesis:** Investigation of flow behaviour and inclusion removal mechanism in a multi-strand tundish with strand blockages.

EXPERIENCE

November 2019 to Present	Assistant Professor Department of Mechanical Engineering King Saud University, Riyadh, Saudi Arabia
December 2018 to October 2019	Research Scientist The Institute for High Technology Materials and Devices, Korea University, Seoul, South Korea <ul style="list-style-type: none">• Worked on POSCO project based on experimental and numerical study of slag compositions & reduced iron in blast furnace.• Research supervision of M.S. and Ph.D. students.• CAD and CFD training to graduate students.
December 2017 to November 2018	Research Professor The Institute for High Technology Materials and Devices, Korea University, Seoul, South Korea <ul style="list-style-type: none">• Worked on POSCO project based on experimental and numerical study of AC flash welded joints.• Industry supported project on the effect of sulphur concentration on interfacial tension between molten microalloyed steel and alumina.• Research supervision of M.S. and Ph.D. students.• CAD and CFD training to graduate students.

December
2016 to
November
2017

Postdoctoral Researcher
Institute of Engineering Design,
Kyungpook National University, Daegu, South Korea

- Worked on Samsung sponsored project on optimization of heat exchanger of an air conditioner.
- CFD modelling of electromagnetic braking of melt flow in continuous casting mould.
- Research supervision of M.S. and Ph.D. students.
- Tutorial classes of graduate students

August 2015
to
December
2016

Assistant Professor
Department of Mechanical Engineering
Aligarh Muslim University, Aligarh, India

- Teaching undergraduate and graduate courses of mechanical engineering.
- Supervised M.S. projects (one-semester) to five students.
- Supervised M.S. thesis (two-semester long) to one student.
- Designed experiments for manufacturing engineering laboratories.
- Collaborated research works with other faculties.
- Organized one national conference and one faculty workshop.
- Involved in various departmental committees.
- Experience of work related to accreditation of college from national board.

February
2012 to
July, 2013

Senior Research Fellow (SRF)
Department of Mechanical & Industrial Engineering
Indian Institute of Technology Roorkee, India

- Worked as an SRF on CSIR, New Delhi sponsored project.
- Design and fabrication of continuous casting system for water-based modelling.
- Numerical investigation on steel grades intermixing in tundish.

November
2011 to
December
2011

Engineer
Research and Development
Cummins Research and Technology India Pvt. Ltd. Pune, India

- Training, CAD design and numerical modelling of engine ignition.

August 2011
to
November
2011

Manager
Automobile Business Unit
Cummins India Ltd. Pune, India

- Installation and testing of engines on client's sites (Tata Motors, Pune).
- Evaluating the engine performance.
- Report generation based on tests.

June 2008

Internship Trainee
NTPC Dadri, India

- Introduction to thermal power plant.
- Report submission.

SCHOLARSHIPS AND AWARDS

2018	Postdoctoral Fellowship The Institute for High Technology Materials and Devices Korea University, Seoul, South Korea
2017	Research Professor Fellowship: The Institute for High Technology Materials and Devices Korea University, Seoul, South Korea.
2016	Postdoctoral Fellowship Institute of Engineering Design Kyungpook National University, Daegu, South Korea
2013– 2015	Ph.D. Scholarship Assistantship Ministry of Human Resource and Development, Government of India
2012 - 2013	CSIR Senior Research Fellowship <i>Indian Institute of Technology Roorkee, India</i>
2009 - 2011	M.Tech. Scholarship Assistantship Ministry of Human Resource and Development, Government of India
2008	Graduate Aptitude Test in Engineering All India Rank: 664
2008 -2009	Merit-cum-Means Scholarship Ministry of Minority Affairs, Government of India
2007	Second Prize for Best Team Presentation Coaching and Guidance Centre, AMU, Aligarh, India
2005	Third Rank in Academic Performance Diploma in Mechanical Engineering, AMU, Aligarh, India

TEACHING EXPERIENCE & INTEREST

Graduate	<ul style="list-style-type: none"> Advanced Manufacturing Process Foundry Technology Additive Manufacturing
Under-graduate	<ul style="list-style-type: none"> Manufacturing Technology-(all) Materials Science, Economy & Management, Manufacturing Process Lab-(all) Metal Casting

GRADUATE STUDENT'S SUPERVISION

Dissertation (2-semester)	<ul style="list-style-type: none"> Maqusud Alam (<i>Master of Technology</i>) at AMU, Aligarh, India.
Projects (1-semester)	<ul style="list-style-type: none"> Syed Abdullah (<i>Master of Technology</i>) at AMU, Aligarh, India. Shakeel Alam (<i>Master of Technology</i>) at AMU, Aligarh, India. Maqusud Alam (<i>Master of Technology</i>) at AMU, Aligarh, India.

INVITED LECTURE

- July 03, 2019: Joint Workshop between Korea University and Kyushu University on Materials Processing at High Temperatures, Kyushu University (ITO campus), Japan.

SKILLS

- **Software Packages:** ANSYS Fluent, Design Modeller, Mesh, SpaceClaim, Tecplot, CFD-Post, EDEM, FactSage, Origin, C++, MS Office etc.
- Hands-on experience on various mechanical machine tools and instruments.

MEMBERSHIPS

- Member: The Korean Institute of Metals and Materials (KIM+).
- Member: Association for Iron & Steel Technology (AIST).

SHORT-TERM COURSES/PROGRAM (ATTENDED)

1. Exchange & Collaboration Program, Kyushu University, Fukuoka, Japan, 2019.
2. Induction Program, UGC Human Resource Development Centre, AMU, Aligarh-2016.
3. Short-term course on Personality Development, UGC HRD Centre, AMU, Aligarh-2015.
4. Special Winter School, UGC Human Resource Development Centre, AMU, Aligarh-2015.
5. QIP Workshop at IIT Roorkee: Advances in Manufacturing Systems, 2015.
6. QIP Workshop at IIT Roorkee: Numerical Methods in Materials Processing, 2013.
7. QIP Workshop at IIT Roorkee: Advances in Surface Modification Technologies, 2013.
8. QIP Workshop at IIT Roorkee: Advances in Joining Technologies, 2012.

ACTIVITIES & ADMINISTRATIVE EXPERIENCE

1. Organizing Member: One Week Faculty Development Program, Trends in Advance and Sustainable Manufacturing Technology, ZHCET, AMU, Aligarh, 2016.
2. Co-coordinator, Faculty Development Program, TASMT, MED, AMU, Aligarh, 2016.
3. Member of Departmental Committee regarding NBA visit, 2016.
4. Member of National Conference organizing committee, AMU, Aligarh, 2016.
5. Tour In-charge of B.E. Final Year (Mechanical Engg.) students, 2015.
6. Member, Organizing committee, 1st International and 16th National Conference on Machines and Mechanisms (iNaCoMM-2013).
7. Organizing member: International Conference PFAM-XXIII at IIT Roorkee in 2014.
8. Participated in Thermal and Fluid Science event in COGIZANCE-2009 at IIT Roorkee.
9. Participated in Industrial & CAD/ACM event in COGIZANCE-2009 at IIT Roorkee.
10. Served as a volunteer Annual Hall Function, AMU Aligarh in 2008.
11. Event Organiser, Organised essay competition in ZHCET, AMU, Aligarh in 2008.
12. Presented a documentary movie, based on Child Labour in India in National Short-Film Festival-2008, Aligarh.
13. Skit Competition, Skit was performed in annual Tech Fest-2007 at ZHCET, AMU, Aligarh.

LANGUAGES

- English- Speak fluently and read/write with high proficiency.
- Hindi & Urdu- Native language.

PERSONAL DETAILS

Father's Name: *Late. Md. Rezaul Haque Siddiqui*

Mother's Name: *Late. Anwari Perween*

Date of Birth: February 07, 1988

Permanent Address: Baika, Darbhanga, Bihar- 847204 India.

REFERENCES

Prof. Joonho Lee

Associate Dean for External Relations, College of Engineering
Professor, Department of Materials Science and Engineering
Director, Centre for Research and Education of Metallurgy
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Please turn over to see Appendix-I

APPENDIX I
LIST OF PUBLICATIONS
MD IRFANUL HAQUE SIDDIQUI
(Research Profile: www.irfansid.com)

Book Chapter in Progress:

- M. I. H. Siddiqui and M. H. Kim, “CFD simulation of melt and inclusion motion in a mold under the influence of electromagnetic force” *Mechanics of Integrated Design and Simulations in Mechanical Engineering*, Elsevier (2019).

A. Journals

- 1) M. I. H. Siddiqui, Dereje Degefa Geleta and Joonho Lee, “Numerical Modeling of the Inclusion Behavior During AC Flash Butt Welding,” *Metallurgical and Materials Transactions A*. *(Under-Review)*
- 2) Man-Hoe Kim, Shehryar Ishaque and M. I. H. Siddiqui, “Effect of heat exchanger design on seasonal performance of heat pump systems,” *International Journal of Heat and Mass Transfer*. *(Under-Review)*
- 3) Dereje Degefa Geleta, M. I. H. Siddiqui and Joonho Lee, “Characterization of Slag Flow in Fixed Packed Bed of Coke Particles,” *Metallurgical and Materials Transactions B*. *(Accepted)*
- 4) M. I. H. Siddiqui and M. H. Kim, “Two-Phase Numerical Modeling of Grade Intermixing in a Steelmaking Tundish,” *Metals*, vol. 9, no. 1, pp. 40, 2019.
- 5) Maqusud Alam and M. I. H. Siddiqui, “CFD simulation of melt and inclusion motion in a mold under the influence of electromagnetic force,” *VW Applied Sciences*, vol. 1(1), pp. 07-14, 2019.
- 6) M. I. H. Siddiqui and M. H. Kim, “Optimisation of flow control device dimensions to minimise the mixing in steelmaking tundish,” *Journal of Mechanical Science and Technology*, vol. 32, no. 7, pp. 3213-3221, 2018.
- 7) M. I. H. Siddiqui and P. K. Jha, “Effect of Inflow Rate Variation on Intermixing in a Steelmaking Tundish during Ladle Change-Over,” *Steel Research International*, vol. 87, no. 6, pp. 733–744, 2016.
- 8) M. I. H. Siddiqui and P. K. Jha, “Numerical simulation of flow-induced wall shear stresses in three different shapes of multi-strand steelmaking tundishes,” *Steel Research International*, vol. 86, no. 7, pp. 799–807, 2015.
- 9) M. I. H. Siddiqui and P. K. Jha, “Numerical Investigation of Inclusion Behaviour in a Multi-Strand Tundish during Strand Blockages,” *Journal of the Institution of Engineers (India): Series D*, Vol. 96, No. 2, pp. 123-130, 2015.
- 10) M. I. H. Siddiqui and P. K. Jha, “Assessment of turbulence models for prediction of intermixed amount with free surface variation using Coupled Level-Set Volume of Fluid Method,” *ISIJ International*, vol. 54, no. 11, pp. 2578-2587, 2014.

B. Conferences

- 1) Dereje Degefa Geleta, M. I. H. Siddiqui and Joonho Lee, “Quantification of Slag Holdup in Carbonaceous Beds” 13th Steel Science Forum, The Korean Institute of Metals and Materials, Seoul National University, South Korea, July 18-19, 2019.

- 2) M. I. H. Siddiqui and Joonho Lee, "CFD Simulation of Liquid Metal Droplet Generation in 3D Printing" The Korean Microgravity Society Conference, Inha University, Incheon, South Korea, June 27-28, 2019.
- 3) M. I. H. Siddiqui and Joonho Lee, "Numerical Modeling of Inclusion Motion Behavior in an AC Flash Butt Welding Process" The Korean Institute of Metals and Materials, International Conference, Daejeon, South Korea, October 24-26, 2018.
- 4) Jiseok Jeong, M. I. H. Siddiqui and Joonho Lee, "Evaluation of the Effect of Temperature and S Concentration on Interfacial Tension of Molten Steel and Alumina Inclusions in Micro-alloyed Steelmaking Process" The 12th Steel Science Forum, The Korean Institute of Metals and Materials, Pohang, South Korea, July 19-20, 2018.
- 5) M. I. H. Siddiqui and Joonho Lee, "Numerical Simulation of Inclusion Particles Pushing and Engulfment Phenomenon in Solidifying Boundary Layer Under the Influence of Thermal and Concentration Gradient in a Welding Process" The Korean Institute of Metals and Materials, International Conference, Jeju, South Korea, April 25-27, 2018.
- 6) M. I. H. Siddiqui, S. Ishaque and Man-Hoe Kim, "Numerical analysis of air flow distribution for a heat exchanger and its effect on condenser capacity in residential AC system" The Society of Air-conditioning and Refrigerating Engineers of Korea (SAREK) Conference, Kunsan National University, Gunsan, South Korea, April 2017.
- 7) Maqusud Alam, M. I. H. Siddiqui, Man-Hoe Kim and Vineet Chak, "Numerical Modeling and Optimization of Steelmaking Tundish Design by using Response Surface Methodology" International Conference on Advances in Materials and Manufacturing, NIFFT, Ranchi, India, 2017.
- 8) M. Farhan, M. M. Zubair and M. I. H. Siddiqui, "Effect of flow modifiers on the flow behaviour of inclusions in steelmaking tundish" 2nd International Conference on Recent Challenges in Engineering and Technology, SIT, CEE, Kolhapur, Maharashtra, India, 2017.
- 9) Parvesh Ali, Himmat Singh, R.S. Walia, Q. Murtaza and M. I. H. Siddiqui, "A Review-Development of Hybrid Abrasive Flow Machining" National Conference on Mechanical Engineering Ideas, Innovation and Initiatives, Aligarh Muslim University, Aligarh, India, pp. 246, April 16-17, 2016.
- 10) M. I. H. Siddiqui, P. K. Jha and Shakeel A., "Effect of Molten Steel Inflow Rate on Grade Mixing in Tundish" National Conference on Mechanical Engineering Ideas, Innovation and Initiatives, Aligarh Muslim University, Aligarh, India, pp. 221, April 16-17, 2016.
- 11) Masood A., Faisal. H., and M. I. H. Siddiqui, "Optimum Allocation of Machine Configurations for Multiple Objectives using NSGA-II, All India Manufacturing Technology, Design and Research (AIMTDR), Pune, 2016.
- 12) R Kumar, A Maurya, M. I. H. Siddiqui and PK Jha, "Some studies in different shapes of tundish-intermixing and flow behaviour" 4th International Conference on Production & Industrial Engineering, NIT Jalandhar, Punjab, India, 2016.
- 13) M. Alam and M. I. H. Siddiqui, "Optimization study of RTD parameters of a slab caster steelmaking tundish," National Conference on Statistical and Analytical Methods in Production and Industrial Engineering, PEC University of Technology, Chandigarh, Feb. 12-13, 2016.
- 14) Masood Ashraf, Faisal Hasan, M. I. H. Siddiqui, "Grouping of Part/Product Variants Based on Operation Sequence Similarity, International Conference on Advanced Production and Industrial Engineering, Delhi Technological University, New Delhi, India, December 2016.
- 15) M. I. H. Siddiqui and P. K. Jha, "Multi-phase analysis of steel-air-slag system during ladle change-over process in CC tundish steelmaking process," in Asia Steel International Conference, Yokohama, Japan, pp. 66-63, October 5-8, 2015.

- 16) M. I. H. Siddiqui, Ambrish Maurya and P. K. Jha, "Physical Investigations of Grade Mixing Phenomenon in Delta Shape Steel-making Tundish," in International Conference CETCME, NIET, Noida, India 2015.
- 17) M. I. H. Siddiqui and P. K. Jha, "Numerical Investigation of Grade Intermixing and Heat Transfer during Ladle Change-Over in Steelmaking Tundish," in 23rd International Conference on Processing and Fabrication of Advanced Materials, IIT Roorkee, Roorkee, India, pp. 981-993, 2014.
- 18) W. Ahmad and M. I. H. Siddiqui, "Study of Grade Intermixing and Heat Transfer in Two Different Shapes of Tundishes," in 23rd International Conference on Processing and Fabrication of Advanced Materials, IIT Roorkee, India, pp. 994-1009, 2014.
- 19) M. I. H. Siddiqui and P. K. Jha, "Grade Mixing Analysis in Steelmaking Tundish using Different Turbulence Models," in 5th International and 26th All India Manufacturing Technology, Design and Research Conference AIMTDR, IIT Guwahati, India, pp. 1-6, 2014.
- 20) M. I. H. Siddiqui and P. K. Jha, "Numerical Analysis of Heat Transfer and Flow Behaviour inside Different Shapes of Multi-Strand Continuous Casting Tundish," in 2nd National Conference on Advances in Heat Transfer and Fluid Dynamics, AMU, Aligarh, India, 2013, pp. 65-72.
- 21) M. I. H. Siddiqui and P. K. Jha, "Modelling of Molten Steel Interface and Grade Mixing in a Tundish Using VOF Model," in Proceedings of the 22th National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, IIT Kharagpur, India, 2013.
- 22) R. Kumar, M. I. H. Siddiqui, and P. K. Jha, "Numerical Investigations on the use of Flow Modifiers in Multi-Strand Continuous Casting Tundish using RTD Curves Analysis," in International Conference on Smart Technologies for Mechanical Engineering, DTU, Delhi, India, 2013, pp. 603-612.
- 23) M. I. H. Siddiqui and P. K. Jha, "Effect of Tundish Shape on Wall Shear Stress in a Multi-Strand Steelmaking Tundish," in International Conference on Smart Technologies for Mechanical Engineering, DTU, Delhi, India, 2013, pp. 122-130.