International Conference on Physical and Mathematical Modelling in Iron and Steelmaking in Honour of Prof. Dipak Mazumdar

Organized by:

Department of Materials Science and Engineering
Indian Institute of Technology Kanpur

December 18th – 19th, 2022

Outreach Auditorium, IIT Kanpur

Technical Program

INAUGURAL FUNCTION

Venue: Outreach Auditorium, IIT Kanpur

Date: 18th December 2022

Time: 9:00 – 9:30 hrs.

PMMIS-2022
18th -19th December 2022

18th December 2022: Outreach Auditorium

Technical Session I: Raw Materials and Ironmaking-I
10:00 -11:45 hrs
Session Chair: Prof. G.S. Gupta

Sl. No.	Time	Speaker	Title of presentation
1	10:00-10:30	Prof. G. G. Roy IIT Kharagpur, India	CFD study of Rotary Hearth Furnace for sponge iron production
2	10:30-11:00	Dr. J. Pal NML, India	Carbon reaction mechanism and kinetics in hematite ore pellet during induration
3	11:00-11.30	Dr. R. Sah JSW, India	High pellet Operation in blast furnace and improvements for the cost-effectiveness of sustainable ironmaking

Tea Break: 11:30 am-11:45 am (15 min)

Technical Session II: Raw Materials and Ironmaking-II
11:45 -13:15 hrs
Session Chairs: Prof. Gautam Biswas

1	11:45-12:15	Prof. G. S. Gupta IISC Bangalore, India	A Robust 3D Model of the Blast Furnace
2	12:15-12:45	Dr. V. Runkana TCS, India	Hybrid Digital Twins for Optimization of Blast Furnace Ironmaking
3	12:45-13:15	Mr. R. Chatterjee Tata Steel, India	TATA STEEL's effort to develop Numerical & Physical models for Blast furnace operation

Lunch Break: 13:15-14:15 (1 hr.)

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Technical Session III: Primary and Secondary Steelmaking-I
14:15-15:45 hrs
Session Chair: Prof. B. Deo

Sl. No.	Time	Speaker	Title of presentation
1	14:15-14:45	Prof. S. Seetharaman KTH, Sweden, (online)	Modelling of Slag properties in Iron and Steelmaking - Thermoslag software
2	14:45-15:15	Prof. C. Pistorius, CMU, USA	Rate and extent of slag-based nitrogen removal from steel
3	15:15-15:45	Prof. A. Kamaraj IIT Hyderabad, India	Physical and Thermodynamic Modelling of Liquid Steel Tapping Process
Tea Break: 15:45 - 16:15			

Technical Session IV: Primary and Secondary Steelmaking-II
16:15-18:15 hrs
Session Chair: Prof. C. Pistorius

1	16:15-16:45	Prof. B. Deo IIT Bhubaneswar, India	Tipping Points Leading To Chaos During BOF Operation
2	16:45-17:15	Prof. S. Ueda, Tohoku University, Japan	Control of physical properties of fluids for low-carbon steelmaking
3	17:15-17:45	Prof. A.K.Singh, IIT Kanpur, India	Mathematical Modelling of EAF Operations
4	17:45-18:15	Mr. Rohit Tiwari, McGill University, Canada	Generating Microbubbles in Liquid Metals

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Felicitation of Prof. Dipak Mazumdar

Venue: Outreach Auditorium, IIT Kanpur

Date: 18th December 2022

Time: 18:30 – 19:30 hrs.

Conference Dinner

Outreach Lawn

19:45 Onwards

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19th December 2022: Outreach Auditorium

Technical Session V: Modelling and Simulation in Iron and Steelmaking
Time: 9:00-10.30 hrs.
Session Chair: Prof. Goutam Deo

Schedule of presentations

Sl. No.	Time	Speaker	Title of presentation
1	9:00-9:30	Prof. N.N.Viswanathan IIT Bombay, India	Designing Experiments to Model
2	9:30-10:00	Dr. A. Mukhopadhyay Ansys, India	Materials Informatics, ICME, Integrated Open Environment for Materials Processing and Product Design Analysis
3	10:00-10:30	Dr. A. Malfliet KU Leuven, Belgium	Flow behaviour and mixing in the AOD process

Tea Break: 10:30-10:45 (15 mins)

Technical Session VI: Deoxidation and Clean Steel Technology
Time: 10:45-12:45 hrs
Session Chair: Prof. Arun K. Saha

1	10:45-11:15	Prof. H. Matsuura University of Tokyo, Japan	Thermodynamics of Deoxidation for High-Mn & Al Fe-Mn-Al Melt
2	11:15-11:45	Prof. Sabita Sarkar IIT Madras, India	Physical modelling of bubble behaviour in steelmaking ladle
3	11:45-12:15	Dr. R.K. Singh RDCIS, SAIL, India	Practical Aspects towards Industrial Application of Gas Stirring In Steel Ladles
4	12:15-12:45	Prof. D. Kumar, IIT Bombay, India	Improving accuracy of kinetic models for ladle refining

Lunch Break: 12:45-13:45 (1 hr)

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Technical Session VII: Casting Processes
Time: 13:45-15.45 hrs
Session Chair: Prof. N.N. Viswanathan

Schedule of presentations

Sl. No.	Time	Speaker	Title of presentation
1	13:45-14:15	Prof. P. K. Jha IIT Roorkee, India	Physical Modeling and Numerical Investigation of Flow Behavior in a continuous casting mold using hexa-furcated nozzle
2	14:15-14:45	Dr. Siddharth Mishra Tata Steel, India	Internal quality issues of strip produced through thin slab casting
3	14:45-15:15	Dr. T.K. Roy Tata Steel, India	Multiphase modelling study to assess the effect of argon flow on sliver occurrences in interstitial free steel
4	15:15-15:45	Dr. D Satish Kumar JSW Steel, India	Improvement in Steel Making Processes at JSW Steel through Physical and Mathematical Modeling

Tea Break: 15:45 - 16:15 (30 mins)

Technical Session VIII: Physical and Mathematical Modelling Enablers
Time: 16:15 -17:15 hrs
Session Chair: Dr. V. Runkana

Sl. No	Company Name	Speaker	Title of presentation
1	Ansys	Dr. L. Srinivasa Mohan	The role of Hybrid Analytics in Modelling and Simulation
2	Gleeble	Dr. Fulvio Siciliano	Physical and Numerical Simulation in Steel Production
3	ThermoCalc	Dr. Nicholas Grundy	Thermodynamic and Kinetic Simulation of Steelmaking and Refining Process using ThermoCalc and CALPHAD type steel and slag database TCOX

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Poster Session

Venue: Outreach Foyer, IIT Kanpur
Date: 19th December 2022
Time: 17:15 – 18:15 hrs.

Valedictory Function

Venue: Outreach Auditorium, IIT Kanpur
Date: 19th December 2022
Time: 18:15 – 19:00 hrs.

High Tea

Outreach Lawn
19:00 Onwards