Dr. Harish Singh Dhami, PhD
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webpageURL GoogleScholar

RESEARCH INTERESTS

Additive manufacturing, Solidification and phase transformation, Mechanics of materials processing, Surface engineering, Sustainable manufacturing.

EDUCATION

Indian Institute of Science, Bangalore *Aug 2018 – Aug 2023*
PhD in Mechanical Engineering

- PhD Thesis ([link])

Indian Institute of Space Science and Technology, Thiruvananthapuram *Jul 2016 – Jul 2018*
MTech in Materials Science and Technology

- MTech Thesis ([link])

Uttarakhand Technical University, Dehradun *Jul 2010 – Jul 2014*
BTech in Mechanical Engineering

EXPERIENCE

Postdoctoral researcher *West Lafayette, USA*
Purdue University *Mar 2024 – present*

- Working on surface mechanics, machining and severe plastic deformation of metals

Research associate-I *Bangalore, India*
Indian Institute of Science *Aug 2023 – Mar 2024*

- Worked on experimental investigation of pattern formation during rapid solidification under confined geometries

Visiting project staff *Thiruvananthapuram, India*
Liquid Propulsion System Center (LPSC)/ ISRO *Jun 2017 – May 2018*

- Worked on properties optimization of nitrogen martensitic steel (HNMS) for cryogenic applications

Teaching assistant *Bangalore, India*
Mechanical Engineering, IISc *Oct – Jan 2021*

- Materials Structure Properties Correlations (ME 228)

Lecturer *Mathura UP, India*
GLA University, Mathura (UP) *Aug 2014 – Jun 2016*

- Teaching mechanical engineering undergraduate and diploma students

JOURNAL PUBLICATIONS

- **Dhami HS**, Panda PR, Puneeth S, Viswanathan K, "Of fiery sparks and glittering spots: melting-resolidification and spherical particle formation in abrasion". *Proc. Roy. Soc. A*, 479, 2271(2023), 20220629. [DOI]
- **Dhami HS**, Panda PR, Mohanty DP, Viswanathan K, "An Analytical Method for Predicting Temperature Rise Due to Multi-body Thermal Interaction in Deformation Processing." *JOM* 74, 513–525 (2022). [DOI]

- **Dhami HS**, Panda PR, Viswanathan K, "Production of powders for metal additive manufacturing applications using surface grinding". *Manuf. Lett.* 32 (2022): 54-58. [DOI]
- **Dhami HS**, Panda PR, Saikiran P, Garg R, Viswanathan K, "A sensing integrated metal additive manufacturing platform for exploring the use of non-standard powders". *J Manuf. Sci. Eng.* (2023),146(3), [DOI]
- **Dhami HS**, Viswanathan K, "Investigating particle morphology, quality, flowability and performance of abrasive-grinding based powders for directed energy deposition.". *Powder Technology* (2024),p.119533. [DOI]
- **Dhami HS**, Kumar ND, Tharian T, Chakravarthy P, "Microstructural Characterization and Mechanical Property Evaluation of High Nitrogen Martensitic Stainless Steel Subjected to Heat Treatment". *Metallography, Microstructure, and Analysis*, (2024): pp 1-10. [DOI]
- Singh A, **Dhami HS**, Sinha MK, Kumar R, "Evaluation and comparison of mineralogical, micromeritics and rheological properties of waste machining chips, coal fly ash particulates with metal and ceramic powders." *Powder Tech.* 408 (2022): 117696. [DOI]
- Garg R*, **Dhami HS***, Panda PR, Viswanathan K, (*equal contribution), "Evaluating gas-driven flow mechanics of non-spherical powers for direct energy deposition". *J. Manuf. Processes.* 99 (2023): 260-271. [DOI]
- Singh A, Singh J, **Dhami HS** , Sinha MK, Kumar R, "Quantifying the influences of coal fly ash on rheological and compaction behaviour of iron powder and mild steel machining chips". *Advanced Powder Tech.*, 33(11) (2022), 103819. [DOI]
- Dawara V, Bajantri A, **Dhami HS**, Murty, SVS, & Viswanathan K,"Design of a low-velocity impact framework for evaluating space-grade materials". *Acta Astronautica* 212 (2023): 606-616. [DOI]
- Singh, A, **Dhami HS** *et al.* "Modeling, deposition, and mechanical characterizations of single-step surface coating using high-speed grinding." *The International Journal of Advanced Manufacturing Technology* 1-11 (2024): [DOI]
- **Dhami HS**, Mohanty DP, Chandrasekar S., "Surface adsorbed media induced embrittlement in metals: study in free-bending configuration." (In preparation).

CONFERENCE PROCEEDINGS (Peer reviewed articles)

- **Dhami HS**, Viswanathan K.(2020) "On the Formation of Spherical Particles in Surface Grinding." Proceedings of the *ASME 2020 MSEC*. Vol1:Sep, 2020. V001T05A005. [DOI]
- **Dhami HS**, Panda PR, Mohanty DP, Udupa A, Viswanathan K, Chandrasekar S, "Unified Analysis of Temperature Fields Arising from Large Strain Deformation and Friction in Manufacturing Processes." *TMS 2021 150th Annual Meeting* & ESP(pp. 921-931). [DOI] Springer Int. Pub.
- **Dhami HS**, Panda PR, Saikiran P, Viswanathan K, "Metal powders via surface grinding: Applicability and performance evaluation for laser sintering", *ASME MSEC 2022-85120*, V002T05A018; 5 pages [DOI]
- Garg, R, **Dhami HS**, Panda PR, Saikiran P, Viswanathan K, "Directed energy deposition using non-spherical metal powder", *ASME MSEC 2022-84945*, V002T05A011; 8 pages, [DOI]

CONFERENCE PROCEEDINGS (Peer reviewed)

- Saikiran, **Dhami HS**, Viswanathan K, Obstacles to progress: Probing interactions between moving fronts and rigid boundaries in 2D systems. Bulletin of the APS (2024).
- Panda, **Dhami HS**, Viswanathan K. Solidification on spherical surfaces. Bulletin of the APS (2024).

BOOK CHAPTERS

- **Dhami HS**, Chandrasekar S, 'Surface topographies in manufacturing of biomedical implants', *de* Gruyter Gmbh, 2025 (in press).

PATENTS

- "An additive manufacturing system", IN patent No.:538401, Application No: 202241012225, Filing date: Mar 7, 2022, Inventors: **Dhami HS**, Panda, PR, Saikiran, P, Viswanthan, K [Granted]
- "Abrasion-based method for production of spherical metal powder", IN patent, Application No: 202141061560, Filing date: Dec 29, 2021 Inventors : **Dhami HS**, Panda, PR, Viswanathan, K [First information report]

PRESS COVERAGE

IISc Researchers Find Low-Cost Method To Produce Metal Powders For 3D Printing: News18 [Link], Indian Express[Link], TOI[Link], AM chronicle[Link], Shiksha [Link].

CONFERENCE PRESENTATIONS/ TALKS

(Invited talk) Applications & Challenges in Industrial and Manufacturing Operations: (ACIMO-24)	*Oct. 17-21, 2024 NIT, Kkr*
(Invited talk) Mechanical divisional research symposium, IISc,	*May 12-13, 2023, IISc Bangalore*
(Poster Presentation) MS&T conference 2023, Columbus, Ohio	*Oct 1-4, 2023, Ohio, USA*
(Oral presentation & workshop) COPEN 22 & MicroMechFab Karyashala	*Dec, 2022, IIT,Kanpur*
(Paper presentation) ASME, MSEC, Purdue University	*Jun 27- Jul 1, 2022, West Lafayette, USA*
(Oral presentation) ME Research Frontier Conference, Dept. of Mechanical Engineering.	*Jul, 2022, IISc Bangalore*
(Paper Presentation) TMS 2021 Virtual Annual Meeting & Exhibition	*Feb, 2021, Virtual*
(Oral Presentation) IIM NMD ATM 2020 International conference, IIM Pune Chapter	*Feb 2021, IIT Bombay*
(Paper Presentation) Manufacturing Science and Engineering Conference (MSEC) 2020 ASME	*September, 2020, virtual*
(Oral Presentation) Annual Meeting, Materials Research Society of India (MRSC), Trivandrum Chapter	*24 Mar, 2018, Thiruvananthapuram, Kerala*
(Oral Presentation) Polymer Science & Indo-Japan Joint Symposium on Polymeric Materials	*31 Jan -1 Feb, 2017, IISER Kerala*

WORKSHOPS/ TRAINING PROGRAMS

(Participated) One Day workshop on NSF Grant and Proposal Writing	*7 Nov, 2024, West Lafayette*
(Participated) One Day workshop on AM: Part Screening & Selection Design for Additive Manufacturing	*18 Jul, 2019, Bangalore*
(Participated) Five Days International Workshop on Advancements in Welding Technology	*19-23 Jun, 2018, NIT Trichy*

(Participated) One Day Workshop on Advancements in Aerospace Materials Joining, Under QIP Program — *30 Mar, 2013, IIT Roorkee*

Industrial Training at Steel Authority of India Ltd. — *May-Jun, 2012, SAIL Bhilai*

SKILLS

- **Advanced analysis/ characterization tools**
  SEM/EDS, XRD, FIB, TEM (SAD/HRTEM), EBSD, UV/Vis spectrometery, FTIR, DMA, DSC, Rheometer, X-ray microCT (tomography)
- **Machine operation:** CNC/ VMC automatic and manual, INSTRON tensile testing machine, Rockwell Hardness testing machine, Extrusion machine
- **Programming tools:** MATLAB, Python, C
- **Design & analysis software:** CAD, CREO, ANSYS FLUENT

ACHIEVEMENTS/ AWARDS

Gold Medal, Mechanical Engineering class of 2010-14
JRF& SRF Fellowship for Research, Ministry of Education, Govt. of India
GATE Masters Fellowship, MHRD, Govt. of India
Young scientist award, National Science Congress, DST, Govt. of India
Winner, Inter-State College Level Project Competition (2013, 2014)

PROFESSIONAL SERVICES

Reviewer: CIRP Journal of manufacturing science and technology, Advanced Engineering Materials (Wiley), American Society of Mechanical Engineering (ASME), MSEC, Steel Research International (Wiley GmbH)
Member: APS, ASME, TMS, SIAM, ASM

REFERENCES

Prof. Koushik Viswanathan , Assoc. Prof, Dept. of ME IISc koushik@iisc.ac.in,[Link]
Prof. S. Chandrasekar. Prof. Indust.& MatEng, Purdue University, chandy@purdue.edu, [Link]
Prof. Satyam Suwas Prof.& Chair (Mat. Engg.) , IISc India, satyamsuwas@iisc.ac.in, [Link]
Prof. Chakravarthy P. Prof., Dept. of Aero. Engg, IIST, chakravarthy@iist.ac.in [Link]