

Curriculum Vitae

HARPREET SINGH GREWAL

Assistant Professor

Department of Mechanical Engineering

School of Engineering

Shiv Nadar University

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Date of Birth: 02nd March 1982

Nationality: Indian

Field of Specialization: Surface engineering (thermal spraying, microwave processing, micro/nano-patterning), Tribology (macro/micro/nano), Development of self-cleaning and smart surfaces, Biomimetic, Additive manufacturing

Academic Qualifications

Degree	Institution/University	Year
Ph.D†	Indian Institute of Technology Ropar	2014
M.Tech*	Punjab Technical University, Jalandhar	2010
B.Tech	Punjab Technical University, Jalandhar	2005
Senior Secondary	Central Board of Secondary Education, New Delhi	2001
Secondary	Central Board of Secondary Education, New Delhi	1999

†**Ph.D dissertation title:** Surface Modification of CA6NM Hydroturbine Steel for Protection against Erosion

***M.Tech dissertation title:** To Study the Slurry Erosion Performance of Detonation Gun Thermal Sprayed Al₂O₃ and WC-Co-Cr Coatings on 13Cr4Ni and 16Cr5Ni Turbine Steels

Research, Teaching and Industrial Experience

Institution	Time period (from-to)	Designation
Department of Mechanical Engineering, Shiv Nadar University, India	July 2015 to till date	Assistant Professor
Center for Biomicrosystems, Korea Institute of Science and Technology, Seoul, Republic of Korea	Feb. 2014 – July 2015	Postdoc
Department of Mechanical Engineering, Ludhiana College of Engineering and Technology, India	Jan. 2010 – Dec. 2010	Assistant Professor
Department of Mechanical Engineering, Ludhiana College of Engineering and Technology, India	May 2007 – Dec. 2009	Lecturer
Kanwal Gurdeep Engineering Works, Punjab, India	June 2005 – May 2007	Design Engineer

Subjects Taught

- Material Science and Engineering (Monsoon 2018)
- Advanced Manufacturing (UG) (Monsoon 2016, Spring 2019)
- Green Tribology (UG) (Spring 2017, 2018, 2019)
- Applied Tribology (UG) (Spring 2017, 2019)
- Surface Engineering (UG) (spring 2018)
- Mechanics of Fluids (UG) (Monsoon 2015, 2016, 2017)
- Machine Design (UG) (Spring 2016)
- Research topics in Design Engineering (PG) (Spring 2018)

Sponsored Research Projects:

Role: Principal Investigator

- 1) Microwave Derived Bi-modal Composite Coatings For Encountering Erosion-Related Problems, *Early Career Research Grant (No. ECR/2015/000106)*, Science and Engineering Research Board (SERB), 2016, **₹32 Lac** (Ongoing- to be completed in July 2019)
- 2) Development of Durable Self-Cleaning Surfaces, *Extramural Grant (No. 22/0756/17/EMR-II)*, Council of Scientific and Industrial Research (CSIR), 2017, **₹28 Lac** (Ongoing)

Role: Co-Principal Investigator

- 1) Best practices in sustainable surface engineering for critical manufacturing industries, Australia-India Council Grant (AIC), 2019, PI- Prof Christopher Berndt (Swinburne University Of Technology, Australia), **\$179.5k** (Under review)
- 2) Modulating Coating Properties for Enhanced Protection from Erosion-Corrosion: A Systematic Approach on Delineating the Effect of Post-Processing Conditions, *Grant in Aid Scheme (No. NRB/4003/PG/399)*, Naval Research Board (NRB), 2017, PI- Dr. Harpreet Singh (SNU) **₹27 Lac**, (Ongoing)
- 3) Indo-US Joint Center for Development of Durable Advanced Materials for Bio-implants, Indo-US Science and Technology Forum (IUSSTF) (IUSSTF/JC/00047/2017), 2017, PI- Dr. Harpreet Singh (IIT Ropar) **₹32 Lac**, (Ongoing)

- 4) Innovative Approach to Energy Savings in New and Existing Indian Habitats: Multilayer System for Energy Efficiency using Phase Change Materials, Initiative To Promote Habitat Energy Efficiency (I-PHEE) (TMD/CERI/BEE/2016/068(G), DST, 2017, PI- Dr. Ghanshyam Pal (SNU), ₹92 lac (Ongoing)
- 5) Development of Cold-Spraying Based Additive Manufacturing Process For Industrial Application, *Uchchatar Avishkar Yojana* (No. UAY_IITRPR_001P), Ministry of Human Resource Development (MHRD) and DST, 2016, ₹285 Lac, in collaboration with IIT Ropar and GE Power, Bangalore (Ongoing)

Dissertations and Project Guidance

Graduate (PhD)

- 1) **Rakesh B. Nair**, *Degradation Behavior of Microwave Derived High Entropy Alloy Coatings for Marine Applications*, Enrollment: January 2016, Role: Supervisor * to submit in June'19
- 2) **Priya Mandal**, *Development of Self-cleaning Superhydrophobic Metallic Surfaces*, Enrollment: August 2016 Role: Co-Supervisor (enrolled with Department of Physics)
- 3) **Abhishek Babu**, *Bimodal Coating Design for Encountering Erosion in Fluid Machines*, Enrollment: January 2017, Role: Supervisor
- 4) **Gopinath Perumal**, *Surface Engineering Strategies for Development of Advanced Bio-implants*, Enrollment: January 2017, Role: Co-Supervisor

Graduate (M.Tech)

- 1) **Abhilash Shishodia**, *Towards Development of Durable Self-Cleaning Polymer Surfaces*, Enrollment: August 2017, Role: Supervisor (completing in April'19)

Undergraduate- Opportunity for Undergraduate Research (OUR) Projects

- 1) **Abhijith Nambiar**, *Developing Superhydrophobic and Oleophobic Surfaces Through Facile Physicochemical Treatments*, Enrollment No.: 1610110004, Aug. 2018 to April 2019, Role: Supervisor **(National patent filed, application for PCT to be filed)**
- 2) **Santhosh Eashwar S**, *Tribological and Wetting Behavior of the Carbon Dots (CDs) reinforced Polymer Composites*, Enrollment No.: 1610110545, Aug. 2018 to April 2019, Role: Supervisor
- 3) **Shreya Gupta**, *Understanding Structural Evolution and Wetting Characteristics of Surfaces Modulated using Paraffin*, Enrollment No.: 1710110316, Aug. 2018 to April 2019, Role: Supervisor
- 4) **Ketan Rajan Singh**, *Feasibility study for generating micro/nano textured surfaces using soft lithography and external stimulations*, Enrollment No.: 1510110192, Sept. 2017 to April 2018, Role: Supervisor
- 5) **R M Sanjiv**, *Comparative Study on Degradation Behavior of Additive Manufactured SS304L Steel*, Enrollment No.: 1410110316, Sept. 2016 to April 2017, Role: Supervisor

Research Publications

Scopus ID: 55122447900; **Orchid Id:** 0000-0001-9265-4674

h-Index: 13; **i10-Index:**15 (source: Google Scholar)

Journal Publications-48

- 1) A Babu, HS Arora, H Singh, **HS Grewal**, (2019) "Microwave Synthesized Composite Claddings with Enhanced Cavitation Erosion Resistance", **Wear**, Vol. 422-423, pp. 242-251 (I.F. 3.2)

- 2) HS Arora, A Ayyagari, J Saini, K Selvam, S Riyadh, M Pole, **HS Grewal**, S Mukherjee (2019) "High tensile Ductility and strength in Dual-phase Bimodal steel through stationary Friction stir processing", **Scientific Reports**, Vol. 9(1), pp. 1972 (I.F. 4.7)
- 3) Gopinath Perumal, Amrita Chakrabarti, **H S Grewal**, Soumya Pati, Shailja Singh, H S Arora, (2019) "Enhanced antibacterial properties and the cellular response of stainless steel through friction stir processing", **Biofouling**, DOI: 10.1080/08927014.2019.1584794 (I.F. 2.8)
- 4) J Saini, HS Arora, **HS Grewal**, G Perumal, A Ayyagari, R Salloom, S Mukherjee, (2019) "Excellent Corrosion Resistance of Dual-Phase Bimodal Stainless Steel", **Steel Research International**, DOI: 0.1002/srin.201800554 (I.F. 1.7)
- 5) R B Nair, H. S. Arora, **H. S. Grewal**, (2019) "Microwave Synthesized Complex Concentrated Alloy Coatings: Plausible Solution to Cavitation Induced Erosion-Corrosion", **Ultrasonics Sonochemistry**, Vol. 41, pp. 252-260 (I.F. 6.0)
- 6) K Selvam, J Saini, G Perumal, A Ayyagari, R Salloom, R Mondal, S Mukherjee, **HS Grewal**, HS Arora (2019) "Exceptional cavitation erosion-corrosion behavior of dual-phase bimodal structure in austenitic stainless steel", **Tribology International**, Vol. 134, pp. 77-86 (I.F. 3.2)
- 7) R B Nair, H. S. Arora, P. Mandal, **H. S. Grewal**, (2018) "Complex concentrated coatings: Effect of processing route on microstructural and mechanical properties", **Material Letters**, Vol. 230, pp. 100-104. (I.F. 2.7)
- 8) A. Ayyagari, V. Hasannaemi, **H. S. Grewal**, H. S. Arora, Sundeep Mukherjee (2018) "Corrosion, Erosion and Wear Behavior of Complex Concentrated Alloys: A Review", **Metals**, Vol. 8(8), pp. 603 (I.F. 1.7)
- 9) A. Babu, H. S. Arora, S. N. Behera, M. Sharma, **H S Grewal**, , (2018) "Towards highly durable bimodal composite claddings using microwave processing", **Surface and Coatings Technology**, Vol. 349, pp. 655-666. (I.F. 2.9)
- 10) R B Nair, H. S. Arora, P. Mandal, S. Das, **H. S. Grewal**, (2018) "High-Performance Microwave-Derived Multi-Principal Element Alloy Coatings for Tribological Application", **Advanced Engineering Materials**, Vol. 20(9), p. 1800163 (I.F. 2.3)
- 11) K Selvam, Priya Mandal, **H S Grewal**, HS Arora, (2018) "Ultrasonic Cavitation Erosion-Corrosion Behavior of Friction Stir Processed Stainless Steel", **Ultrasonics Sonochemistry**, Vol. 44, pp. 331-339 (I.F. 6.0)
- 12) R B Nair, A. Ayyagari, H. S. Arora, Sundeep Mukherjee, **H. S. Grewal**, (2018) "High Entropy Alloys: Prospective Materials for Tribo-Corrosion Applications", **Advanced Engineering Materials**, Vol. 20(6), p. 1700946 (I.F. 2.3)
- 13) R B Nair, H. S. Arora, Sundeep Mukherjee, S. Singh, H. Singh, **H. S. Grewal**, (2018) "Exceptionally High Cavitation Erosion and Corrosion Resistance of a High Entropy Alloy", **Ultrasonics Sonochemistry**, Vol. 41, pp. 252-260 (I.F. 6.0)
- 14) Gopinath Perumal, Aditya Ayyagari, Amrita Chakrabarti, Deepika Kannan, Soumya Pati, **H S Grewal**, Sundeep Mukherjee, Shailja Singh, H S Arora, (2017) "Friction Stir Processing of Stainless Steel for Ascertaining its Superlative Performance in Bio-Implant Applications", **ACS Applied Materials & Interfaces**, Vol. 9(42), pp. 36615–36631 (I.F. 8.1)
- 15) K Selvam, A Ayyagari, **H S Grewal**, S Mukherjee, HS Arora, (2017) "Enhancing the Erosion-Corrosion Resistance of Steel through Friction Stir Processing", **Wear**, Vol. 386-387, pp. 129-138 (I.F. 2.96)
- 16) Prashant Pendyala, Hong Nam Kim, **H S Grewal**, Il-Joo Cho, Eui-Sung Yoon, (2017) "Effect of capillary forces on the correlation between nanoscale adhesion and friction of polymer patterned surfaces", **Tribology International**, Vol. 114, pp. 436-444 (I.F. 3.2)

- 17) Karthikeyan Selvam, A Prakash , **H S Grewal**, H S Arora, (2017) "Structural Refinement in Austenitic Stainless Steel by Submerged Friction Stir Processing", **Materials Chemistry and Physics**, Vol. 197, pp. 200-207 (*I.F.* 2.2)
- 18) **H S Grewal**, R M Sanjiv, H S Arora, Ram Kumar, A. Ayyagari, Sundeep Mukerjee, H Singh, (2017) "Activation Energy and High Temperature Oxidation Behavior of Multi-Principal Element Alloy", **Advanced Engineering Materials**, Vol. 19(11), p. 1700182 (*I.F.* 2.3)
- 19) **H S Grewal**, Prashant Pendyala, Hyogeun Shin, Il-Joo Cho, Eui-Sung Yoon, (2017) "Nanotribological Behavior of Bioinspired Textured Surfaces with Directional Characteristics", **Wear**, Vol. 384, pp. 151-158 (*I.F.* 3.2)
- 20) B S Rakesh, Karthikeyan Selvam, H S Arora, Sundeep Mukherjee, H Singh, **H S Grewal**, (2017) "Slurry Erosion Behavior of High Entropy Alloys", **Wear**, Vol. 386-387, pp. 230-238 (*I.F.* 2.96)
- 21) Karthikeyan Selvam, B S Rakesh, H Singh, **H S Grewal**, H S Arora, (2017) "High Strain Deformation of Austenitic Steel for Enhancing the Erosion Resistance", **Wear**, Vol. 376, pp. 1021-1029 (*I.F.* 2.96)
- 22) Prashant Pendyala, **H S Grewal**, Hong Nam Kim, and Il-Joo Cho, Eui-Sung Yoon, (2016) "Individual role of the physicochemical characteristics of nanopatterns in adhesion and friction", **ACS Applied Material and Interface**, Vol. 8, pp. 30590-30600 (*I.F.* 8.1)
- 23) **H S Grewal**, Piao, S., Cho, Il-Joo, Jhang, K-Y, and Yoon, Eui-Sung, (2016) " Nanotribological and Wetting Performance of Hierarchical Patterns " **Soft Matter**, Vol. 12, pp. 859-866 (*I.F.* 3.7)
- 24) **H S Grewal**, Kim Hong Nam, Cho, Il-Joo, and Yoon, Eui-Sung (2015), "Role of Viscous Dissipative Processes on the Wetting of Textured Surfaces" **Nature Scientific Reports**, Vol. 5, paper no. 14159 (*I.F.* 4.1)
- 25) **H S Grewal**, Singh, H., and Yoon, Eui-Sung (2015), "Interplay Between Erodent Concentration and Impingement Angle for Erosion in Dilute Water-Sand Flows" **Wear**, Vol. 332-333, pp. 1111-1119 (*I.F.* 2.96)
- 26) **H S Grewal**, Cho, Il-Joo, and Yoon, Eui-Sung (2015), "The Role of Bio-Inspired Hierarchical Structures in Wetting" **Bioinspiration & Biomimetics**, Vol. 10(2), paper no: 026009 (*I.F.* 2.7)
- 27) **H S Grewal**, Cho, Il-Joo, Oh, Jae-Eung, and Yoon, Eui-Sung (2014), "Effect of topography on the wetting of nanoscale patterns: experimental and modeling studies", **Nanoscale**, Vol. 6, pp. 15321-15332 (*I.F.* 7.2)
- 28) Arora, H.S., **H S Grewal**, Mridha, S., Singh, H., Mukherjee, S. (2014), "Structural changes in amorphous metals from high-strain plastic deformation", **Materials Science and Engineering A**, Vol. 617(3), pp. 175-178 (*I.F.* 3.4)
- 29) **H S Grewal**, Singh, H., and Agrawal, A. (2014), "A Phenomenological Model for Slurry Erosion Prediction of Thermal Spray Coating", **Tribology Letters**, Vol. 56, pp. 119-132 (*I.F.* 2.2)
- 30) Arora, H.S., Mridha, S., **H S Grewal**, Singh, H., Hofmann, D.C., Mukherjee, S. (2014), "Controlling the length scale and distribution of the ductile phase in metallic glass composites through friction stir processing", **Science and Technology of Advanced Materials**, Vol. 15(3), paper no. 035011 (*I.F.* 4.78)
- 31) **H S Grewal**, Arora, H.S., Singh, H., Agrawal, A., and Mukherjee, S. (2014), "Improving Erosion Resistance of Hydroturbine Steel Using Friction Stir Processing", **Journal of Tribology**, Vol. 136(4), paper no. 041102 (*I.F.* 1.78)
- 32) Arora, H.S., **H S Grewal**, Veligatla, M., Singh, H., Mukherjee, S. (2014), "Microwave assisted in situ composite coating using metallic glass precursor", **Surface Engineering**, Vol. 30(11), pp. 779-783 (*I.F.* 1.97)

- 33) **H S Grewal**, Agrawal, A., Singh, H., and Shollock, B.A. (2014), "Slurry Erosion Performance of Ni-Alumina Thermal Spray Coatings: Effect of Impingement angle", **Journal of Thermal Spray Technology**, Vol. 23(3), pp. 389-401 (*I.F.* 1.95)
- 34) Arora, H.S., **H S Grewal**, Singh, H., Dhindaw, B. K, and Mukherjee, S. (2014), "Enhancing the Mechanical Properties of AE42 Magnesium Alloy through Friction Stir Processing", **Advanced Engineering Materials**, Vol. 16(5), pp. 571-580 (*I.F.* 2.3)
- 35) **H S Grewal**, Agrawal, A., and Singh, H. (2013), "Slurry Erosion Mechanism of Hydroturbine Steel: Effect of Operating Parameters", **Tribology Letters**, Vol. 52(2), pp. 287-303 (*I.F.* 2.2)
- 36) Arora, H.S., **H S Grewal**, Singh, H., Dhindaw, B. K, and Mukherjee, S. (2013), "Unusually high erosion resistance of zirconium based bulk metallic glass", **Journal of Materials Research**, Vol. 28, pp. 3185-3189 (*I.F.* 1.5)
- 37) **H S Grewal**, Agrawal, A., and Singh, H. (2013), " Slurry erosion performance of Ni-Al₂O₃ based composite coatings", **Tribology International**, Vol. 66, pp. 296-306 (*I.F.* 3.2)
- 38) Arora, H.S., **H S Grewal**, Singh, H., Dhindaw, B. K., McPhail, D., Shollock,, B., Chater, R., Mukherjee, S. (2013), "Microstructure-Property Relationship for Friction Stir Processed Magnesium Alloy", **Advanced Engineering Materials**, Vol. 16(1), pp. 94-102 (*I.F.* 2.3)
- 39) **H S Grewal**, Arora, H.S., Agrawal, A., Singh, H., and Mukherjee, S. (2013), "Slurry erosion of thermal spray coatings: Effect of sand concentration", **Procedia Engineering**, Vol. 68, pp. 484-490
- 40) **H S Grewal**, Agrawal, A., and Singh, H. (2013), "Identifying Erosion Mechanism: A Novel Approach", **Tribology Letters**, Vol. 51 (1), pp. 1-7 (*I.F.* 2.2)
- 41) Arora, H.S., **H S Grewal**, Singh, H., Mukherjee, S. (2013), "Zirconium based bulk metallic glass - better resistance to slurry erosion compared to hydroturbine steel", **Wear**, Vol. 307 (1-2), pp. 28-34 (*I.F.* 2.96)
- 42) **H S Grewal**, Singh, H., and Agrawal, A. (2013), "Understanding Liquid Impingement Erosion Behaviour of Nickel-Alumina Based Thermal Spray Coatings", **Wear**, Vol. 301(1-2), pp. 424-433 (*I.F.* 2.96)
- 43) **H S Grewal**, Arora, H.S., Agrawal, A., and Singh, H. (2013), "Surface Modification of Hydroturbine Steel using Friction Stir Processing", **Applied Surface Science**, Vol. 268 (1), pp. 547-555 (*I.F.* 4.4)
- 44) **H S Grewal**, Singh, H., and Agrawal, A. (2013), "Microstructural and Mechanical Characterization of Nickel-Alumina Thermal Sprayed Coatings", **Surface and Coating Technology**, Vol. 216, pp. 78–92 (*I.F.* 2.9)
- 45) **H S Grewal**, Agarwal, A., Singh, H. (2013), "Design and Development of High-Velocity Slurry Erosion Test Rig using CFD", **Journal of Material Engineering and Performance**, Vol. 22, pp. 152–161 (*I.F.* 1.34)
- 46) **H S Grewal**, Bhandari, S., Singh, H. (2012), "Parametric Study of Slurry-Erosion of Hydroturbine Steels with and without Detonation Gun Spray Coatings using Taguchi Technique", **Metallurgical and Materials Transactions A**, Vol. 43A, pp. 3387–3401 (*I.F.* 1.88)
- 47) **H S Grewal**, Agrawal, A., Singh, H., and Arora, H. S. (2012), "Cavitation erosion Studies on Friction Stir Processed Hydroturbine Steel", **Transactions of Indian Institute of Metals**, Vol. 65(6), pp. 731-734 (*I.F.* 0.9)
- 48) Arora, H. S., Singh, H., Dhindaw, B. K., and **H S Grewal**, (2012), "Some Investigations on Friction Stir Processed Zone of AZ91 Alloy", **Transactions of Indian Institute of Metals**, Vol. 65(6), pp. 735-739 (*I.F.* 0.9)

International Conferences-34

- 1) **H S Grewal**, H S Arora, "Development of Robust Superhydrophobic Self-Cleaning Surface from Rice-husk Ash", 10th International Conference on Materials for Advanced Technologies (ICMAT 2019) organized by Materials Research Society of Singapore, Singapore, 23th to 28th June 2019 (Abstract accepted)
- 2) **H S Grewal**, H S Arora, "Multidimensional Durability of Microwave Synthesized High Entropy Alloy Claddings", 10th International Conference on Materials for Advanced Technologies (ICMAT 2019) organized by Materials Research Society of Singapore, Singapore, 23th to 28th June 2019
- 3) H S Arora, **H.S. Grewal**, S. Mukherjee, "A Facile Single-step Processing for Ascertaining High Tensile Ductility and Strength in Austenitic Stainless Steel," 10th International Conference on Materials for Advanced Technologies (ICMAT 2019) organized by Materials Research Society of Singapore, Singapore, 23th to 28th June 2019 (Abstract accepted)
- 4) H S Arora, **H. S. Grewal**, H. Singh, "Exceptional Degradation Resistance of Thermal Spray Coating through Stationary Friction Processing", 10th International Conference on Materials for Advanced Technologies (ICMAT 2019) organized by Materials Research Society of Singapore, Singapore, 23th to 28th June 2019 (Abstract accepted)
- 5) Priya Mandal, Gopinath Perumal, H S Arora, Sajal Kumar Ghosh, **H S Grewal**, "Fabrication of multifunctional nano-structured aluminium surface by simple hot water treatment", International Conference on Advanced Materials (ICAM-2019) organized by Department of Physics, Nirmalagiri College, Kerala, India, 12th to 14th June 2019 (Abstract accepted)
- 6) Abhishek Babu, H S Arora, **H S Grewal**, "Enhanced Slurry and Cavitation Erosion Resistance of Microwave Derived Bimodal Composite Claddings" 10th International Conference on Materials for Advanced Technologies (ICMAT 2019) organized by Materials Research Society of Singapore, Singapore, 23th to 28th June 2019 (Abstract accepted)
- 7) Abhishek Babu, H S Arora, Ramit Singh, **H S Grewal** "Comparative Studies of Microwave Synthesized and Microwave Post Processed WC-Co-Cr Claddings For Cavitation Behavior" 10th International Conference on Materials for Advanced Technologies (ICMAT 2019) organized by Materials Research Society of Singapore, Singapore, 23th to 28th June 2019 (Abstract accepted)
- 8) Priya Mandal, Abilash Shishodia, Nasir Ali, S Ghosh, H S. Arora, **H S. Grewal**, Sajal K. Ghosh, "Multifunctional micro-patterned Aluminum Surfaces: Characterization and their applications", International Conference on Advanced Materials, organized by Jamia Millia Islamia, New Delhi, India, 6th to 7th March 2019
- 9) Abhishek Babu, H S Arora, **H S Grewal**, "Comparative Evaluation of the Erosion Behavior of Microwave-Derived and Thermal Sprayed Coatings" 6th International Conference on Advances in Composite Materials (ICRACM 2019) organized by Indian Institute of Technology Banaras Hindu University, Varanasi, February 25-28, 2019
- 10) G. Perumal, A. Chakrabarti, A. Ayyagari, D. Kannan, S. Pati, **H.S. Grewal**, S. Mukherjee, S. Singh and Harpreet Singh Arora, "Towards Superior Bio-implant Steels through Submerged Friction Stir Processing" MS&T18 – Materials Science and Technology Conference, Portland, Oregon USA Oct 14 – 18, 2018
- 11) G. Perumal, A. Ayyagari, A. Chakrabarti, S. Pati, **H.S. Grewal**, S. Mukherjee, S. Singh and Harpreet Singh Arora, "Influence of phase change and Ultra fine-grained microstructure in SS316L for biomedical applications," BioMET2018 - International conference on Bio-Materials, Bio-Engineering and Bio-Theranostics, VIT Vellore, July 24 – 28, 2018
- 12) G. Perumal, A. Chakrabarti, S. Pati, **H.S. Grewal**, S. Singh and Harpreet Singh Arora, "Anti-bacterial activity of Friction stir processed austenitic stainless steel with *S. coccus* and *E.coli*", BioMET2018 -

- International conference on Bio-Materials, Bio-Engineering and Bio-Theranostics, VIT Vellore, July 24 – 28, 2018
- 13) Palak Jain, H S Arora, **H S Grewal**, “*Development of Bio-Inspired Self-Cleaning Surfaces Using Hybrid Approach*” International Conference on Advances in Science & Technology (ICAST-2018) organized by Swami Keshvanand Institute of Technology, Jaipur, May 4-5, 2018
 - 14) Abhishek Babu, H S Arora, **H S Grewal**, “*Cavitation Erosion Behavior of Microwave Derived Ni-Based Composite Coatings*” International Conference on Advances in Science & Technology (ICAST-2018) organized by Swami Keshvanand Institute of Technology, Jaipur, May 4-5, 2018
 - 15) Rakesh Nair, H S Arora, **H S Grewal**, “*Tribo-Corrosion Behaviour of High Entropy Alloy*” International Conference on Advances in Science & Technology (ICAST-2018) organized by Swami Keshvanand Institute of Technology, Jaipur, May 4-5, 2018
 - 16) P.Mandal, Abhilash Shishodia, N.A. Sayad, S. Ghosh, H.S. Arora, **H.S. Grewal**, S.K. Ghosh, "Micro-patterned aluminium surfaces: Characterization and their applications", Soft and Active Matter Workshop, UGC-Networking Resource Centre, School of Physics, University of Hyderabad, 10th to 18th February 2018
 - 17) Prashant Pendyala, Hong Nam Kim, **H S Grewal**, Il-Joo Cho, Eui-Sung Yoon, “*Time scales and dimensionality of wetting transitions on butterfly wing inspired micro-cavity surfaces*”, **10th International Symposium of Nature Inspired Technology**, June 28th to July 1st 2017, Jpark Island Resort and Waterpark, Cebu, Philippine
 - 18) Prashant Pendyala, Hong Nam Kim, **H S Grewal**, Il-Joo Cho, Eui-Sung Yoon, “*Effect of capillary forces on tribology of lotus and mushroom inspired pillar patterned surfaces*”, **10th International Symposium of Nature Inspired Technology**, June 28th to July 1st 2017, Jpark Island Resort and Waterpark, Cebu, Philippine (poster)
 - 19) **H S Grewal**, Prashant Pendyala, Hyogeun Shin, Il-Joo Cho, Eui-Sung Yoon, “*Nanotribological Behavior of Bioinspired Textured Surfaces with Directional Characteristics*”, **21st Wear of Materials (WOM) Conference**, March 26th to March 30th 2017, Long Beach, California, United States
 - 20) B S Rakesh, Karthikeyan Selvam, H S Arora, Sundeep Mukherjee, H Singh, **H S Grewal**, “*Slurry Erosion Behavior of High Entropy Alloys*”, **21st Wear of Materials (WOM) Conference**, March 26th to March 30th 2017, Long Beach, California, United States
 - 21) Karthikeyan Selvam, B S Rakesh, H Singh, **H S Grewal**, H S Arora, “*High Strain Deformation of Austenitic Steel for Enhancing the Erosion Resistance*”, **21st Wear of Materials (WOM) Conference**, March 26th to March 30th 2017, Long Beach, California, United States (poster)
 - 22) **H S Grewal**, Arora, H.S., and Yoon, Eui-Sung “*Nanotribological studies of patterned surfaces*” **Third International Conference on Nanotechnology for Better Living**, 25th to 29th May 2016, National Institute of Technology Srinagar, India
 - 23) Arora, H.S., **H S Grewal**, and Mukherjee S. “*Nanomechanical behavior of thermo-plastically formed metallic glass nanostructures*” **Third International Conference on Nanotechnology for Better Living**, 25th to 29th May 2016, National Institute of Technology Srinagar, India
 - 24) Prashant Pendyala, **H S Grewal**, Shin Hyogeun, Cho, Il-Joo, and Yoon, Eui-Sung, “*Characteristics of wetting on butterfly-wing inspired cavity surfaces*”, **9th International Symposium on Nature Inspired Technology**, 13th to 15th Jan. 2016, Daejeon, Republic of Korea. (poster)
 - 25) **H S Grewal**, Shin Hyogeun, Cho, Il-Joo, and Yoon, Eui-Sung, “*Biomimicking Butterfly Wing Surface Texture for Improved Tribological Performance*”, **31st European Conference on Surface Science (ECOSS-31)**, Aug. 31 to 4th Sept. 2015, Barcelona, Spain

- 26) **H S Grewal**, and Yoon, Eui-Sung, "*Nanotribological aspects of the hierarchical patterns*", **20th Wear of Materials (WOM) Conference**, April 12th to April 16, 2015 Toronto, Canada (poster)
- 27) **H S Grewal**, Singh, H., and Yoon, Eui-Sung, "*Interplay Between Erodent Concentration and Impingement Angle for Erosion in Dilute Water-Sand Flows*", **20th Wear of Materials (WOM) Conference**, April 12th to April 16, 2015 Toronto, Canada
- 28) **H S Grewal**, and Yoon, Eui-Sung, "*Role of Surface Topography on Wettability And Tribological Properties*", **The 6th International Conference on Manufacturing, Machine Design and Tribology (ICMDT 2015)**, The Japan Society of Mechanical Engineers, April 22nd to April 25th, Okinawa, Japan 2015
- 29) **H S Grewal**, Arora, H.S., Agrawal, A., Singh, H., and Mukherjee, S. "*Slurry erosion of thermal spray coatings: Effect of sand concentration*", **Malaysian International Tribology Conference 2013 (MITC2013)**, Kota Kinabalu, Sabah, Malaysia, 18-20 Nov. 2013
- 30) **H S Grewal**, Singh, H., and Agrawal, A., "*Understanding Liquid Impingement Erosion Behaviour of Nickel-Alumina Based Thermal Spray Coatings*", **19th Wear of Materials (WOM) Conference**, Portland, Oregon, USA, 2013
- 31) **H S Grewal**, Arora, H.S., Agrawal, A., and Singh, H., "*Development of Novel Mathematical Model for Slurry Erosion Prediction*", **Third Asian Conference on 'Mechanics of Functional Materials and Structures (ACMFMS 2012)**, Indian Institute of Technology Delhi, India, 2012
- 32) Arora, H.S., Singh, H., **H S Grewal**, and Dhindaw, B.K., "*3-Dimensional Transient Heat Modeling and Simulation of Strain Fields during Friction Stir Processing*", **Third Asian Conference on 'Mechanics of Functional Materials and Structures (ACMFMS 2012)**, Indian Institute of Technology Delhi, India, 2012
- 33) **H S Grewal**, Singh, H. and Agrawal, A., "*Numerical Simulation of Erosion Using Computational Fluid Dynamics*" **141th TMS Annual Meeting** March 11-15, held at Florida, USA, pp. 89-96, 2012
- 34) **H S Grewal**, Singh, H. and Arora, H.S., "*Evaluation and Development of Economical Viable Coatings for Erosion Protection of Hydroturbines*" **Advances in Materials and Processing Challenges and Opportunities (AMPCO 2012)**, Indian Institute of Technology Roorkee, Roorkee, India, 2012

National Conferences-12

- 1) Prashant Pendyala, Harpreet Grewal, Eui-Sung Yoon, "*Nanotribological performance of superhydrophobic multi-scale patterns*", **Korean Society of Tribologists and Lubrication Engineers (KSTLE) Fall Conference & Lubricants Symposium**, Oct. 2016
- 2) Prashant Pendyala, Harpreet Grewal, Hong Nam Kim, and Il-Joo Cho, Eui-Sung Yoon, "*Wetting and Evaporation Characteristics of Microstructures Simulating Butterfly Wings*", **Korean Society of Mechanical Engineers (KSME) Annual Spring conference**, 4th Nov. 2016
- 3) Prashant Pendyala¹, **Grewal, H.S.**, Shin Hyogeun, Cho, Il-Joo, and Yoon, Eui-Sung "*Wetting and Adhesion Characteristics of Micro-Cavity Patterns*", **Korean Society of Mechanical Engineers Conference (KSME)**, 10 Nov. to 14 Nov. 2015, Jeju, South Korea
- 4) Prashant Pendyala¹, **Grewal, H.S.**, Shin Hyogeun, Cho, Il-Joo, and Yoon, Eui-Sung, "*Interplay between surface energy and micro-texture at the contact*", **Korean Society of Tribologists and Lubrication Engineers (KSTLE) Fall Conference & Lubricants Symposium**, 14 Oct. to 15 Oct. 2015, Gyeongju, South Korea

- 5) Grewal, H.S., Cho, Il-Joo, and Yoon, Eui-Sung, "Nanotribological Behavior of Mushroom Patterned Surface", **Korean Society of Mechanical Engineers Conference (KSME)**, 21 May to 22 May 2015, Busan, South Korea
- 6) Grewal, H.S., Cho, Il-Joo, and Yoon, Eui-Sung, "Wetting Modeling and Simulation of Hierarchical Structures", **Korean Society of Mechanical Engineers Conference (KSME)**, 11th Nov. to 14th Nov., 2014, Gwanju, South Korea
- 7) Grewal, H.S., Cho, Il-Joo, and Yoon, Eui-Sung, "Role of Viscosity on Wetting of Hydrophobic Surfaces", **Korean Society of Tribologists and Lubrication Engineers (KSTLE) Fall Conference & Lubricants Symposium**, 15th Oct. to 17th Oct. 2014, Goseong, South Korea.
- 8) Grewal, H.S., and Bhandari S., "Review Paper on Slurry Erosion of Plasma and Flame Sprayed Coatings," **Advances in Mechanical Engineering**, Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib, India 2010.
- 9) Grewal, H.S., and Bhandari S., "Review Paper on Slurry Erosion of D-gun and HVOF Sprayed Coatings", **Advances in Mechanical Engineering**, Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib, India 2010.
- 10) Grewal, H.S., Singh, G. and Singh, J., "To Investigate the Slurry Erosion Performance of 13Cr4Ni steel using Taguchi Method", **Recent Trends in Mechanical Engineering**, Haryana College of Technology & Management, Kaithal, 2010
- 11) Grewal, H.S., and Bhandari S., Singh, H. and Kansal, H.K., "Slurry Erosion Performance of Hydroturbine Steel and Thermal Spray Coating", **Futuristic trends in Mechanical Engineering**, Guru Nanak Dev Engineering College, Ludhiana, 2010
- 12) Grewal, H.S., and Bhandari S., and Singh, H., "To Investigate slurry erosion performance of Hydroturbine steel and Detonation gun coating using Taguchi Method", **2nd International Conference on Production and Industrial Engineering**, National Institute of Technology, Jalandhar

Book Chapter:

- 1) Arora, H. S., Grewal, H. S., Singh, H., Dhindaw, B. K., and Mukherjee, S. (2014) "Corrosion behaviour of friction stir processed and welded materials" in **Advances in Friction-Stir Welding and Processing**, Edited by M-K Besharati-Givi and P Asadi, Published by Woodhead Publishing, Cambridge, U.K. ISBN: 9780857094544
- 2) Grewal, H. S., Singh, H., (2015) "Slurry Erosion Behavior of Thermal Spray Coatings" in **Thermal Sprayed Coatings and Their Tribological Performances**, Edited by Manish Roy and J. Paulo Davim, Published by IGI Global, Hershey, PA, USA. ISBN: 9781466674899

Patents filed/granted:

- 1) **H S Grewal**, H Singh, and A Agrawal, "**Simplified Liquid Droplet Erosion Tester**", Application No.: 201611026820 (published)
- 2) H S Arora, **H S Grewal**, Jaskaran Singh, Karthikeyan Selvam, "**A Method for Modifying Surface Grain Structure of the Material and Apparatus Thereof**" Application No.: 201711025562 (published) *PCT/IN2018/050004*
- 3) H S Arora, **H S Grewal**, Shailja Singh, Soumya Pati, Gopinath Perumal, "**An Apparatus and a Method for Processing Stainless Steel and an Improved Stainless Steel for Bioimplants Thereof**", Application No.: 201711025604 (published) *PCT/IN2018/050005*

- 4) **H S Grewal**, H S Arora, Abhishek Babu, “**Erosion Resistance Bimodal Composite Coating Composition And Method Thereof**”, 201811031399 (filed)
- 5) H S Arora, **H S Grewal**, Gautam T, Kashish Vijay, Karthikeyan Selvam “**An Improved Powder Refining Device And Method Thereof**”, 201811034959 (filed)
- 6) **H S Grewal**, H S Arora, Abhijith Nambiar, Abhishek Babu “**Facile Physiochemical treatment for Developing Non-fluorinated Self-cleaning Surface**”, Application No: 201911002740 (filed)
- 7) H S Arora, **H S Grewal**, Sundeep Mukherjee, H Singh, Gopinath Perumal “**A Stationary Friction Processing System For Minimizing Segregation In A Metallic Work Piece And Method Thereof**”, Application No: 201911007802 (filed)

Invited Talks

- **Multidimensional Durability of Microwave Synthesized High Entropy Alloy Claddings**, 10th International Conference on Materials for Advanced Technologies (ICMAT 2019) organized by Materials Research Society of Singapore, Singapore, 23th to 28th June 2019
- **Tribology and its importance in Mechanical Engineering**, Lyallpur College of Engineering and Technology, Jalandhar, India, 7th Oct. 2016

Awards/Fellowships

- **Best PhD Thesis Award (2014)**, Indian Institute of Technology Ropar
- **Early Career Research Award** by Science and Engineering Research Board, Department of Science and Technology, Government of India (2016)
- **KIST Young Researcher Award** by Korea Institute of Science and Technology, Republic of Korea (2014)
- **Swiss Government Excellence Postdoctoral Fellowship** by State Secretariat for Education, Research and Innovation (SERI), Switzerland (2014)
- **TTRF Young Tribologist Award** by Taiho Kogyo Tribology Research Foundation, Japan (2013)
- **Travel grant** by Council of Scientific and Industrial Research (CSIR), Government of India, for attending the Malaysian International Tribology Conference 2013 at Kota Kinabalu, Malaysia
- **Exchange Student Fellowship** awarded by British Council, UKIERIA for visiting Imperial College London (2013)
- Scholarship awarded by Structural Materials Division of TMS (The Minerals, Metals and Materials Society), USA for presenting the paper at 141st TMS Annual meeting (2012)

Membership of Professional Bodies

- Life member of Tribological Society of India
- Society of Materials and Mechanical Engineers

Peer Reviewing

- **Grant Agency:**
 - Science and Engineering Research Board (SERB), India
 - Chilean National Science and Technology Commission, Chile

- **Journals:**

Ultrasonics Sonochemistry, Wear, Tribology International, Langmuir, Soft Matters, Material Letters, RSC Advances, Material Characterization, Surface and Coatings Technology, Material Chemistry and Physics, Materials and Design, Journal of Alloys and Compounds, Intermetallics, Scientific Reports

Short-Term Courses/Seminars/Workshops Attended

- Symposium on *Surface Engineering, Paints and Coatings*, 7th to 9th October 2015 at India Expo Centre, Greater Noida, Organized by The Society for Surface Protective Coatings (SSPC)
- National workshop on *Additive Manufacturing (3D Printing)* during 17th to 18th August, 2015 at Shiv Nadar University, India
- Staff development program on topic "*Recent Advances in Computational Sciences with Application*" during 22nd to 27th Nov. 2010 at IIT Kharagpur, Kharagpur, India
- Staff development program on topic "*Design and Analysis Using FEM, X-FEM and Meshfree Methods*" during 12th to 16th July 2010 at IIT Roorkee, Roorkee, India
- Staff development program on topic "*Metallurgical aspects of Tribology*" during 30th Nov- 4th Dec 2009, at SVNIT, Surat, India
- Staff development program on topic "*Thermal Spray Techniques and their Applications in Surface Engineering*" during June 22, 2009 to July 3, 2009 at B. B. S. B. Engg. College Fatehgarh Sahib, India
- Staff development program on topic "*Experimental and Computational Methods in Fluid Mechanics*" during 7-19th July, 2008 at MNNIT, Allahabad, India
- Workshop on topic "*Teaching Methodologies for Engineers*" from 2-6th July 2007 at L.C.E.T, KataniKalan Ludhiana, India