

## FACULTY PROFILE



**Name :** Dr. Amit Kumar

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### Professional Qualification:

Qualification	Title	Organization/ Institute	Year
Ph. D.	Mechanical Engineering	I.I.T. Jodhpur, India	2025
M. Tech.	Alternate Hydro Energy Systems	I.I.T. Roorkee, India	2012
B. Tech.	Mechanical Engineering	COER, Roorkee, India	2008

### Publications (SCI/ESCI and Scopus)

2022	
1	<b>Kumar, Amit;</b> Pandey, Chandan   Some studies on dissimilar welds joint P92 steel and Inconel 617 alloy for AUSC power plant application   International Journal of Pressure Vessels and Piping   Elsevier   DOI: <a href="https://doi.org/10.1016/j.ijpvp.2022.104678">https://doi.org/10.1016/j.ijpvp.2022.104678</a>   IF: 3   h-Index : 87
2	Sirohi, Sachin; <b>Kumar, Amit;</b> Soni, Shiva; Dak, Gaurav; Kumar, Sanjeev; Świerczyńska, Aleksandra; Rogalski, Grzegorz; Fydrych, Dariusz; Pandey, Chandan   Influence of PWHT parameters on the mechanical properties and microstructural behavior of multi-pass GTAW joints of P92 steel  Material   MDPI   DOI: <a href="https://doi.org/10.3390/ma15124045">https://doi.org/10.3390/ma15124045</a>   IF: 3.4   h-Index : 148
3	Sirohi, S; Saurav, A; <b>Kumar, A;</b> Kumar, S; Rajasekaran, T; Kumar, P; Vidyarthi, RS; Kumar, N; Pandey, C   Characterization of microstructure and mechanical properties of Cr-Mo Grade P22/P91 steel dissimilar welds for supercritical power plant application  Journal of Materials Engineering and Performance   Springer   DOI: <a href="https://doi.org/10.1007/s11665-022-06747-y">https://doi.org/10.1007/s11665-022-06747-y</a>   IF: 2.3   h-Index : 78
4	<b>Kumar, Amit;</b> Pandey, Chandan   Autogenous laser-welded dissimilar joint of ferritic/martensitic P92 steel and Inconel 617 alloy: Mechanism, microstructure, and mechanical properties  Archives of Civil and Mechanical Engineering   Springer   DOI: <a href="https://doi.org/10.1007/s43452-021-00365-6">https://doi.org/10.1007/s43452-021-00365-6</a>   IF: 4.4   h-Index : 60

5	<b>Kumar, A;</b> Pandey, C   Development and evaluation of dissimilar gas tungsten arc-welded joint of P92 steel/inconel 617 alloy for advanced ultra-supercritical boiler applications  Metallurgical and Materials Transactions A   Springer   DOI: <a href="https://doi.org/10.1007/s11661-022-06723-0">https://doi.org/10.1007/s11661-022-06723-0</a>   IF: 2.8   h-Index : 177
6	<b>Kumar, Amit;</b> Pandey, Shailesh M; Pandey, Chandan   Dissimilar weldments of ferritic/martensitic grade P92 steel and Inconel 617 alloy: Role of groove geometry on mechanical properties and residual stresses  Archives of Civil and Mechanical Engineering   Springer   DOI: <a href="https://doi.org/10.1007/s43452-022-00592-5">https://doi.org/10.1007/s43452-022-00592-5</a>   IF: 4.4   h-Index : 60
<b>2023</b>	
7	Sirohi, Sachin; Kumar, Naveen; <b>Kumar, Amit;</b> Pandey, Shailesh M; Adhithan, Balamurugan; Fydrych, Dariusz; Pandey, Chandan   Metallurgical characterization and high-temperature tensile failure of Inconel 617 alloy welded by GTAW and SMAW—a comparative study  Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications   SAGE Publications   DOI: <a href="https://doi.org/10.1177/14644207231171266">https://doi.org/10.1177/14644207231171266</a>   IF: 2.4   h-Index : 42
8	<b>Kumar, Amit;</b> Pandey, Chandan   Structural integrity assessment of Inconel 617/P92 steel dissimilar welds for different groove geometry  Scientific Reports   Nature   DOI: <a href="https://doi.org/10.1038/s41598-023-35136-1">https://doi.org/10.1038/s41598-023-35136-1</a>   IF: 4.6   h-Index : 282
9	<b>Kumar, Amit;</b> Pandey, Shailesh Mani; Bhattacharyya, Abir; Fydrych, Dariusz; Sirohi, Sachin; Pandey, Chandan   Selection of electrode material for Inconel 617/P92 steel SMAW Dissimilar welds  Journal of Pressure Vessel Technology   ASME   DOI: <a href="https://doi.org/10.1115/1.4062794">https://doi.org/10.1115/1.4062794</a>   IF: 1   h-Index : 55
10	<b>Kumar, Amit;</b> Bhattacharyya, Abir; Pandey, Chandan   Structural integrity assessment of Inconel 617/P92 steel dissimilar welds produced using the shielded metal arc welding process  Journal of Materials Engineering and Performance   Springer   DOI: <a href="https://doi.org/10.1007/s11665-023-08363-w">https://doi.org/10.1007/s11665-023-08363-w</a>   IF: 2.3   h-Index : 78
11	<b>Kumar, Amit;</b> Guguloth, Krishna; Pandey, Shailesh M; Fydrych, Dariusz; Sirohi, Sachin; Pandey, Chandan   Study on microstructure-property relationship of Inconel 617 alloy/304L SS steel dissimilar welds joint  Metallurgical and Materials Transactions A   Springer   DOI: <a href="https://doi.org/10.1007/s11661-023-07136-3">https://doi.org/10.1007/s11661-023-07136-3</a>   IF: 2.8   h-Index : 177
12	<b>Kumar, Amit;</b> Pandey, Shailesh M; Sirohi, Sachin; Fydrych, Dariusz; Pandey, Chandan   P92 steel and inconel 617 alloy welds joint produced using ERNiCr-3 filler with GTAW process: Solidification mechanism, microstructure, mechanical properties and residual stresses   Heliyon   Elsevier   DOI: <a href="https://doi.org/10.1016/j.heliyon.2023.e18959">https://doi.org/10.1016/j.heliyon.2023.e18959</a>   IF: 4   h-Index : 69
13	<b>Kumar, Amit;</b> Sirohi, Sachin; Pandey, Shailesh Mani; Kumar, Pradeep; Fydrych, Dariusz; Pandey, Chandan   High-Temperature Tensile Behaviour of GTAW Joints of P92 Steel and Alloy 617 for Two Different Fillers  Materials   MDPI   DOI: <a href="https://doi.org/10.3390/ma16175880">https://doi.org/10.3390/ma16175880</a>   IF: 3.4   h-Index : 148
14	Sirohi, Sachin; <b>Kumar, Amit;</b> Pandey, Shailesh M; Purohit, Priyambada; Fydrych, Dariusz; Kumar, Sanjeev; Pandey, Chandan   Dissimilar autogenous TIG joint of Alloy 617 and AISI 304H steel for AUSC application   Heliyon   Elsevier   DOI:

	<a href="https://doi.org/10.1016/j.heliyon.2023.e19945">https://doi.org/10.1016/j.heliyon.2023.e19945</a>   IF: 4   h-Index : 69
15	Dak, Gaurav; Singh, Vivek; <b>Kumar, Amit</b> ; Sirohi, Sachin; Bhattacharyya, Abir; Pandey, Chandan; Pandey, Shailesh M   Microstructure and mechanical behaviour study of the dissimilar weldment of 'IN82 buttered' P92 steel and AISI 304L steel for ultra super critical power plants   Materials Today Communications   Elsevier   DOI: <a href="https://doi.org/10.1016/j.mtcomm.2023.107552">https://doi.org/10.1016/j.mtcomm.2023.107552</a>   IF: 3.8   h-Index : 42
<b>2024</b>	
16	Surkar, S Hardik; <b>Kumar, Amit</b> ; Sirohi, Sachin; Shailesh M; Świerczyńska, Aleksandra; Fydrych, Dariusz; Pandey, Chandan.   A dissimilar welded joint of grade 92 steel and AISI 304L steel obtained using IN82 buttering and IN617 filler: relationship of microstructure and mechanical properties   Archives of Civil and Mechanical Engineering   Springer   <a href="https://doi.org/10.1007/s43452-024-00920-x">https://doi.org/10.1007/s43452-024-00920-x</a>   IF: 4.4   h-Index : 60
17	<b>Kumar Amit</b> , Sirohi Sachin, Singh Manohar, Fydrych Dariusz, Pandey Chandan   Microstructure and mechanical properties of a dissimilar metal welded joint of Inconel 617 and P92 steel with Inconel 82 buttering layer for AUSC Boiler application   International Journal of Pressure Vessels and Piping   Elsevier   <a href="https://doi.org/10.1016/j.ijpvp.2024.105196">https://doi.org/10.1016/j.ijpvp.2024.105196</a>   IF: 3   h-Index : 87
18	Rathore Saurabh, <b>Kumar Amit</b> , Sirohi Sachin, Singh Vivek, Gupta Ankur, Fydrych Dariusz, Pandey Chandan   Role of buttering layer composition on microstructural heterogeneity and mechanical properties of Alloy 617 and P92 steel dissimilar welded joints for future Indian AUSC Program   International Journal of Advanced Manufacturing Technology   Springer   <a href="https://doi.org/10.1007/s00170-024-13747-w">https://doi.org/10.1007/s00170-024-13747-w</a>   IF: 3.4   h-Index : 161
19	<b>Kumar Amit</b> , Guruloth Krishna, Pandey Chandan   Creep rupture properties of dissimilar welded joint of ferritic/martensitic P92 steel and Inconel 617 alloy   Engineering Failure Analysis   Elsevier   <a href="https://doi.org/10.1016/j.engfailanal.2024.108725">https://doi.org/10.1016/j.engfailanal.2024.108725</a>   IF: 4.4   h-Index : 102
20	Rathore, S., <b>Kumar, Amit</b> , Sirohi, S., Pandey, S. M., Gupta, A., Fydrych, D., & Pandey, C.   Advanced ultra super critical power plants: role of buttering layer   The International Journal of Advanced Manufacturing Technology   <a href="https://doi.org/10.1007/s00170-024-14469-9">https://doi.org/10.1007/s00170-024-14469-9</a>   IF: 2.9   h-Index : 161
<b>2025</b>	
21	<b>Kumar Amit</b> , Guguloth K., Pandey S M., Sachin S., Świerczyńska A., Fydrych D., Pandey C.   Microstructure degradation and creep failure study of the dissimilar metal welded joint of heat-resistant steel and Inconel 617 alloy tested at 650 °C and applied stress range of 100-150 MPa   International Journal of Pressure Vessels and Piping   <a href="https://doi.org/10.1016/j.ijpvp.2024.105370">https://doi.org/10.1016/j.ijpvp.2024.105370</a>   IF: 3   h-Index : 87
22	<b>Kumar Amit</b> , Gupta Kalpna, Tiwari Preeti, Tyagi Chandra S, Sirohi Sachin, Pandey Chandan   Study on the Effect of Varying Cooling Conditions on Microstructural and Mechanical Performance of the GTAW Joint of Heat-Resistant P92 Steel   Journal of Materials Engineering and Performance   <a href="https://doi.org/10.1007/s11665-024-10562-y">https://doi.org/10.1007/s11665-024-10562-y</a>   IF: 2.3   h-Index : 84
23	<b>Kumar Amit</b> , Pandey Chandan   Creep rupture and microstructural analysis of dissimilar welded joints of P92 steel and Alloy 617   Welding International

	<a href="https://doi.org/10.1080/09507116.2024.2442480">https://doi.org/10.1080/09507116.2024.2442480</a>   IF:   h-Index: 29
24	Sirohi Sachin, <b>Kumar Amit</b> , Singh Manohar, Fydrych Dariusz & Pandey Chandan   Pulsed GTAW joint of P92 steel and Inconel 625: microstructure and mechanical properties   Archives of Civil and Mechanical Engineering   <a href="https://doi.org/10.1007/s43452-025-01153-2">https://doi.org/10.1007/s43452-025-01153-2</a>   IF: 4.4   h-Index : 60
25	Moulali Dudekula, <b>Kumar Amit</b> , Guguloth Krishna, Sirohi Sachin, Tyagi S Chandra, H. Natu & Pandey Chandan   Laser welding on 10 mm thick grade 92 steel for USC applications: microstructure and mechanical properties   Archives of Civil and Mechanical Engineering   <a href="https://doi.org/10.1007/s43452-025-01144-3">https://doi.org/10.1007/s43452-025-01144-3</a>   IF: 4.4   h-Index : 60

### Conferences:

1	Sirohi, Sachin; Kumar, Sanjeev; <b>Kumar, Amit</b> ; Kumar, Ashish; Pandey, Chandan   To investigate the effect of process parameters on the dissimilar welded joint of AA7075 and Cu   International Conference on Future Trends in Materials and Mechanical Engineering (ICFTMME-2022)   Materials Today: Proceedings   Elsevier   DOI: <a href="https://doi.org/10.1016/j.matpr.2023.01.009">https://doi.org/10.1016/j.matpr.2023.01.009</a> .
2	<b>Kumar, Amit</b> ; Pandey, Chandan; Bhattacharyya, Abir   High-Temperature Tensile Behavior of P92/Inconel 617 Dissimilar Weldments   International Conference in Recent Advances in Mechanical Engineering (ICRAM 2022)   ISBN: 978-93-91355-76-0 (eBook).
3	Presented a conference paper titled “The Behaviour of Dissimilar Welded Joint of Alloy 617/P92 Steel at High Temperatures” during 9th International & 30th All India Manufacturing Technology, Design and Research Conference (AIMTDR 2023), organized by the Department of Mechanical Engineering, IIT (BHU) Varanasi on December 08-10, 2023.   Journal of Materials Engineering and Performance   Springer   <a href="https://doi.org/10.1007/s11665-025-10652-5">https://doi.org/10.1007/s11665-025-10652-5</a> .

**Patent:** NA

### Awards and Achievements:

- CV Raman Gold Medal Award for best thesis work in PhD Program.
- Reviewer for journals including Engineering Failure Analysis, Scripta Materialia, IJ of Pressure Vessels & Piping, Journal of Constructional Steel Research etc.
- Delivered an expert talk on “Weldability Issues in Dissimilar Weld Joints of Ni-based Superalloy and Cr-Mo Grade Steel” in FDP on "Modern Trends in Manufacturing Technologies," College of Engineering Roorkee (July 15, 2022).

### Work Experience:

Assistant Professor, College of Engineering Roorkee, Roorkee — Aug 2014 – Dec 2019

Assistant Professor, Roorkee Institute of Technology, Roorkee — Jan 2013 – Dec 2013

Assistant Professor, Uttaranchal University, Dehradun—Feb 2014 – Aug 2014

Assistant Professor, Meerut Institute of Engineering and Technology, Meerut — Jul 2012 – Jan 2013

Lecturer, Roorkee Institute of Technology, Roorkee — Feb 2009 – Jul 2010

**Professional Memberships:** NA

**Significant Engineering Contributions:**

My engineering contributions lie in developing innovative solutions for dissimilar metal welding (DMW) to fabricate thick-section components like steam pipes and boiler headers. This area is of great interest to many researchers and industries today, including the power, automotive, marine, and aerospace sectors, where structures are subjected to harsh environmental conditions such as high temperature and pressure, sub-zero temperatures, and corrosive environments. The early failures of DMW joints can be attributed to one or more of the following factors: (i) differences in coefficients of thermal expansion (CTE), (ii) carbon migration, (iii) discrepancies in creep properties, (iv) the formation of oxide notches, and (v) the development of a soft heat-affected zone. The mismatch in CTE leads to the accumulation of residual stresses at the interface between the weld metal and base metal, generating substantial localized tensile stresses and ultimately contributing to the failure of the DMW joint. In this context, I conducted significant research on the weldability issues of ferritic steel (P92) and nickel-based superalloy (Inconel 617). These materials are promising candidates for next-generation ultra-supercritical and advanced ultra-supercritical power boilers. My PhD research, supported by a seed grant from IIT Jodhpur and external funding from Science and Engineering Research Board (SERB), investigates weldability issues in DMW joints for various industrial applications, including thermal power plants and marine environments. Extensive efforts have been made to explore the microstructure, mechanical properties, residual stresses, and creep behavior of DMW joints to address these challenges across ultra-supercritical and advanced ultra-supercritical power boilers applications. In my research, I investigate the impact of heat treatment procedures, filler composition, weld groove geometry, and buttering procedures on the mechanical properties, creep properties and microstructural behavior of DMW joints. In future, I aim to contribute to the creation of more reliable, efficient, and sustainable industrial applications. My intention is to bridge the gap between research and industry by developing practical solutions for real-world applications. This can be achieved by collaborations with experts in materials science, mechanical engineering, and industrial engineering to tackle complex challenges in dissimilar metal joining.