Publications

International Journal Articles

1. Chandraul, Amiy, V. Murari, and Satish Kumar “Experimental and numerical investigation of the deployment behaviour of creased membrane”, Springer Nature [Accepted] doi 10.1038/s41598-025-29094-z
2. Avadesh Yadav; Satish Kumar; Abhishek Kumar “Viscoelastic and Stiffness Modelling of CF Dispersed Shape Memory Epoxy Composites: A Deployable Solar Concept" Journal of Polymer Research [Accepted]
3. Avadesh Yadav, Akanksha Singh and Satish Kumar "Computational Design and Analysis of Biocompatible Shape Memory Polymer-Based Self-Expandable Stent" to Journal of Polymer Engineering [Accepted]
4. Avadesh Yadav, Satish Kumar and Abhishek Kumar, “Viscoelastic Characterization and Stiffness Modelling of Carbon Fiber Dispersed Shape Memory Epoxy Composites for Space Applications” Advances in Space Research [Accepted]
5. Avadesh Yadav, Rushikethu Badardinni, Satish Kumar and Abhishek Kumar, “Finite Element Analysis of Shape Memory Behaviour of Carbon Fiber Reinforced Bisphenol-A based Epoxy Composites” Journal of Polymer Engineering, [Accepted]
6. Rushikethu Badardinni, Ravindra Singh, Avadesh Yadav, Satish Kumar, Renganathan Sujithra, Abhishek Kumar “Thermo-Mechanical Behavior and Shape Memory Performance of Graphene Nanoplatelets-Reinforced Epoxy Nanocomposites,” Polymers Advanced Technologies Volume36, Issue12, December 2025, e70443 https://doi.org/10.1002/pat.70443
7. Avadesh Yadav, Sourabh Kumar Singh, Satish Kumar and Abhishek Kumar, “Investigation of MWCNT Dispersion in Epoxy-Based Shape Memory Polymer Using Probe Ultrasonication: Characterization and Mechanical Evaluation” Journal of Materials Science, 60, 9374–9395, 2025 (SCIE: Impact factor-3.5) https://doi.org/10.1007/s10853-025-10976-6
8. Avadesh Yadav, Sourabh Kumar Singh, Sreetam Das, Satish Kumar and Abhishek Kumar, “Shape memory polymer and composites for space applications: A review” Polymer Composites, 1-37, 2025 (SCI: Impact factor-4.8) https://doi.org/10.1002/pc.29707
9. Avadesh Yadav, Sreetam Das, Sourabh Kumar Singh, Rushikethu Badardinni, Satish Kumar and Abhishek Kumar, “Effect of dual dispersion of carbon fiber and silica nanoparticles on recovery performance of shape memory epoxy” Smart Materials and Structures, 33 (6) 065044, 2024 (SCIE: Impact factor-4.1) https://doi.org/10.1088/1361-665X/ad4d37
10. Avadesh Yadav, Sourabh Kumar Singh, Sreetam Das, Satish Kumar and Abhishek Kumar, “Shape recovery and mechanical properties investigation of carbon fiber dispersed Bisphenol-A based epoxy composite” Smart Materials and Structures, 32 (9) 095016, 2023 (SCIE: Impact factor-4.1) https://doi.org/10.1088/1361-665X/aceb27
11. Chandraul, Amiy, V. Murari, and Satish Kumar. "A review on dynamic analysis of membrane based space structures." Advances in Space Research . 74(2), 740-763.
12. Chandra M, Kumar K, Thakur P, Chattopadhyaya S, Alam F, & **Kumar S.** (2022) *Digital technologies, healthcare and Covid-19: insights from developing and emerging nations*. Health Technology (Berl). 2022; 12(2):547-568. doi: 10.1007/s12553-022-00650-1. Epub 2022 Mar 6. PMID: 35284203; PMCID: PMC8898601.

13. Chandra, M., **Kumar, S.,** Chattopadhyaya, S., Chatterjee, S., & Kumar, P. (2021). *A review on developments of deployable membrane-based reflector antennas*. Advances in Space Research, 68(9), 3749-3764.
14. Shinde, S. D., **Kumar, S**., & Upadhyay, S. H. (2021). *Investigation on material combination technique to enhance the anti-wrinkle and anti-vibration characteristics of the planar membrane reflector*. Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, 235(21), 5675-5683.
15. **Kumar, S.**, Upadhyay, S. H., & Vsevolod V Koryanov (2020), *Research and modelling of wrinkles and control of rectangular membrane structures with high-class modeling in on-orbit conditions*, Materials Science and Engineering, 882
16. **Kumar, S.**, Upadhyay, S. H., & Vsevolod V Koryanov (2020), *A wrinkling analysis and control of rectangular membrane structures with upscale modelling under on-orbit conditions,* Materials Science and Engineering, 882
17. **Kumar, S.**, Upadhyay, S. H. and Singh, K. S. (2018). *A new wrinkle free design of membrane structures for on-orbit space application*. International Journal of Mechanical and Materials Engineering, 37 (1)
18. **Kumar, S.**, Upadhyay, S. H., Singh, K. S; and Sakhare, S. (2018). *Influence factors analysis of membrane under Static and dynamic conditions*, SSME, ISRO, 17 (2).
19. **Kumar, S.**, Upadhyay, S. H., & Mathur, A. C. (2015). *Wrinkling simulation of membrane structures under tensile and shear loading*. Journal of Vibration Analysis, Measurement, and Control, 3(1), 17-33.

International/National Conference Papers / Symposium

1. Shape Memory Behavior of Carbon Fiber Reinforced Bisphenol-A based Epoxy Composite" Accepted to present in the 10th International Congress onComputational Mechanics and Simulation (ICCMS 2025) organizing by Indian Institute of Technology Bhubaneswar, India during 17-19 December 2025. [Accepted]
2. Avadesh Yadav, Sourabh Kumar Singh, Satish Kumar and Abhishek Kumar, "Deep Learning-Based Prediction of Dynamic Mechanical Behavior in Epoxy-Based Shape Memory Polymers", in the International Conference on Advances in Science & Technology (ICAST 2025) organized by Institute of Technology and Management (ITM), Dehradun, Uttarakhand, India, held during 23rd-25th June 2025.
3. Amrendra Kumar Singh and **Satish Kumar**, "Numerical Simulation and Dynamic Stability During Inflation of Membrane Based Torus Structures" International Conference on Space for Sustainability: Science, Technology, Education and Policy (S2: STEP2025) & 6th Indian Planetary Science Conference (IPSC-2025) Centre for Space Science and Technology, IIT Roorkee, 4th -7th March 2025.
4. Amiy Chandraul; Murari V; and **Satish Kumar**, "Wrinkling Analysis of Adaptive Membrane Structures at On-orbit Conditions" International Conference on Space for Sustainability: Science, Technology, Education and Policy (S2: STEP2025) & 6th Indian Planetary Science Conference (IPSC-2025) Centre for Space Science and Technology, IIT Roorkee, 4th -7th March 2025.
5. Amiy Chandraul; Paras Nath Rai; Murari V; and **Satish Kumar**, "Neutral Angle Characterization in Single-Creased Membranes: An Experimental Approach" International Conference on Space for Sustainability: Science, Technology, Education and Policy (S2: STEP2025) & 6th Indian Planetary Science Conference (IPSC-2025) Centre for Space Science and Technology, IIT Roorkee, 4th -7th March 2025.

6. Pradeep Singh and **Satish Kumar** , "Dynamics Analysis of Circular Torus Membrane Based Inflatable Antenna" International Conference on Space for Sustainability: Science, Technology, Education and Policy (S2: STEP2025) & 6th Indian Planetary Science Conference (IPSC-2025) Centre for Space Science and Technology, IIT Roorkee, 4th -7th March 2025.
7. Amiy Chandraul, Murari V, and **Satish Kumar**, "Finite Element Modelling and Analysis of Wrinkled Space Membrane Structures Under Thermal Load", 14th Structural Engineering Convention (An International Conference), Department of Civil Engineering, NIT Tiruchirappalli, 12-14th Dec 2024.
8. Amiy chandraul, V. Murari, and **Satish kumar**, "Wrinkle reduction of pre-stressed membrane structures", International Conference on Experimental Mechanics (ICEM 2024) IIT Madras, 20th – 23rd October 2024.
9. Amiy chandraul, V. Murari, and **Satish kumar**, "Vibration analysis of wrinkled and unwrinkled membrane structures", International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE 2024), 25th -28th August 2024, Washington, DC, USA.
10. Avadesh Yadav, Rushikethu Badardinni, Amiy Chandraul, Abhishek Kumar and **Satish Kumar**, "Finite Element Modelling and Simulation of Shape Memory Behavior of Carbon Fiber Reinforced Bisphenol-A Based Epoxy Composites", International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE 2024), 25th -28th August 2024, Washington, DC, USA.
11. Pradeep Singh and **Satish Kumar**, "Numerical Analysis of Inflatable Membrane Structures and Behavior of Folding and Deployment", International Conference on Advances in Aerospace and Energy Systems (IAES 2024), 4th - 6th April, 2024, LPSC, ISRO, Valiamala Thiruvananthapuram Kerala, India.
12. Amiy chandraul, V. Murari, and **Satish kumar**, "Effect of Added Mass of Air on the Vibration Analysis of the Inflatable Torus", International Conference on Advances in Aerospace and Energy Systems (IAES 2024), 4th - 6th April, 2024, LPSC, ISRO, Valiamala Thiruvananthapuram Kerala, India.
13. Amiy chandraul, V. Murari, and **Satish kumar**, "Parametric Study for Modal Analysis Of Inflatable Torus", International Conference on Innovative Science, Engineering & Technology (ICISTECH2023), 7th - 8th December, 2023, Amity University, Patna.
14. Avadesh Yadav, Ratnesh Kumar Yadav, Abhishek Kumar and **Satish Kumar** "Temperature-Step/Hold Multi-Frequency Dynamic
    Mechanical Analysis to Study Viscoelastic Behaviour of Shape Memory Epoxy for Space Structure and Component" Third Global Conference on Recent Advances in Sustainable Materials (GC-RASM 2023), PGP College of Engineering & Technology, Tamil Nadu, India, 27 - 28, July 2023.
15. **Satish Kumar,** *Study and Analysis of Inflatable support system for defence application*, Global Indian Young Scientists Research and Innovation Conference 2023, 31st May and 2nd June at National Agricultural Science Complex - ICAR, New Delhi.
16. Anmol Yadav and **Satish Kumar**, New approach for dynamic analysis of ultra-thin membrane structures using finite element approach under space condition. 5th Indian Conference On Applied Mechanics (INCAM 2022), November 11-13, 2022, National Institute of Technology Jamshedpur
17. Sourabh Kumar Singh, Avadesh Yadav, Akanksha Singh, Abhishek Kumar, and **Satish Kumar**, Analysis of Copper Reinforcement Effect on Epoxy Based Shape Memory Polymer for Smart Actuators. 5th Indian Conference On Applied Mechanics (INCAM 2022), November 11-13, 2022, National Institute of Technology Jamshedpur

18. Pradeep Singh and **Satish Kumar,** Numerical Analysis of Inflatable Membrane Structures and Behavior of Folding and Deployment, International Conference on Recent Advances in Mechanical Engineering 2022 (ICRAM-2022), 25 – 27 August 2022, Department Of Mechanical Engineering Indian Institute of Technology Jodhpur, Rajasthan, India-342030
19. Kuldeep Singh and **Satish Kumar,** Numerical Analysis of Wrinkled Configuration in Thin Multilayer Membrane Structures, International Conference on Recent Advances in Mechanical Engineering 2022 (ICRAM-2022), 25 – 27 August 2022, Department Of Mechanical Engineering Indian Institute of Technology Jodhpur, Rajasthan, India-342030
20. Sourabh Kumar Singh, Avadesh Yadav, Abhisekh Kumar , and **Satish Kumar**, ANALYSIS OF SHAPE MEMORY POLYMER BASED SPACE ACTUATORS National Conference on Artificial Intelligence enabled Aerobots and Hydrobots (ASET-2022), Vikram Sarabhai Space Centre, Thiruvananthapuram, March 17 - 18, 2022
21. Kuldeep Singh and **Satish Kumar,** Simulation of wrinkling behavior of thin membrane structures National Conference on Artificial Intelligence enabled Aerobots and Hydrobots (ASET-2022), Vikram Sarabhai Space Centre, Thiruvananthapuram, March 17 - 18, 2022
22. Pradeep Singh and **Satish Kumar**, Analysis of Shape Stability of Membrane Structure with Lattice Reinforcement, International Conference on Advancements in Interdisciplinary Research, Theme: Smart and Sustainable Society (AIR2022) Motilal Nehru National Institute of Technology (MNNIT) Allahabad, India, May 6-7, 2022
23. Amiy chandraul, V. Murari, and **Satish kumar**, Dynamic analysis and shape control of membrane structures, International Conference on Advancements in Interdisciplinary Research, Theme: Smart and Sustainable Society (AIR2022) Motilal Nehru National Institute of Technology (MNNIT) Allahabad, India, May 6-7, 2022.
24. Vikash Kumar and **Satish Kumar,** Modeling and Simulation of piezoelectric based Hybrid Energy Harvesting System, International Conference on Advancements in Interdisciplinary Research, Theme: Smart and Sustainable Society (AIR2022) Motilal Nehru National Institute of Technology (MNNIT) Allahabad, India, May 6-7, 2022.
25. Devendra Kumar Gautam, Audhesh Narayan, **Satish Kumar,** and Ajaya Bharti, Finite Element Analysis of Laser Cladding Process, International Conference on Advancements in Interdisciplinary Research, Theme: Smart and Sustainable Society (AIR2022) Motilal Nehru National Institute of Technology (MNNIT) Allahabad, India, May 6-7, 2022.
26. Sreetam Das, Sourabh Kumar Singh, Avadesh Yadav, **Satish Kumar,** and Abhishek Kumar, Finite Element Analysis of a Shape Memory Polymer for Space Actuator Applications, International Conference on Advancements in Interdisciplinary Research, Theme: Smart and Sustainable Society (AIR2022) Motilal Nehru National Institute of Technology (MNNIT) Allahabad, India, May 6-7, 2022.
27. Raghuvanshi , V;& **Kumar., S** (2021) Scaling Analysis of Rectangular Planner Membrane Structures Considering Various Parameters, International Conference on Mechanical Engineering (INCOME-2021), 25 - 26 November, 2021,Netaji Subhas University of Technology, New Delhi, India.
28. Kumar, V; Pandey, R; & **Kumar., S** (2021) A Finite Element Method of Free Vibration Analysis of Functionally Graded Beam, International Conference on Mechanical Engineering (INCOME-2021), 25 - 26 November, 2021,Netaji Subhas University of Technology, New Delhi, India.
29. Patel, K; & **Kumar., S** (2021) Vibration Analysis of Membrane Based Inflatable Torus, International Conference on Mechanical Engineering (INCOME-2021), 25 - 26 November, 2021,Netaji Subhas University of Technology, New Delhi, India.

30. Pandey, S; & **Kumar., S** (2021) A Numerical Analysis of the effect of wind speed on Hybrid Energy Harvesting System, International Conference on Mechanical Engineering (INCOME-2021), 25 - 26 November, 2021,Netaji Subhas University of Technology, New Delhi, India
31. Siddiqui,A; Murari, V; & **Kumar., S** (2021) Simulation of Deployment of Inflatable Structures Through Uniform Pressure Method, International Conference on Advanced Manufacturing and Materials Processing (CAMMP 2021). July 24 - 25, 2021., MNIT Jaipur, India.
32. Kumar, V; Pandey, R; & **Kumar, S**, (2021) Recent Research of Active Vibration Control Analysis of Functionally Graded Materials using Piezoelectric Materials: A Review, International Conference on Sustainable Engineering" (ICSE-2021) organized by Government Engineering College Bikaner, Rajasthan, held on 26 – 27 February, 2021
33. **Satish Kumar.,** Kunal Kumar, Prabhat Thakur & Prakash Kumar (2019), Design and Analysis of MFC based Energy Harvesting Systems,6th International Conference on Production and Industrial Engineering(CPIE-2019), 8^{th}-10^{th} June 2019, NIT Jalandhar, Punjab, India
34. **Kumar, S.,** Kamaliya, P.; Sharma, H., &;Upadhyay, S. H.,(2018), A novel concept of MFCbased energy harvesting systems, Advanced Energy and Nano Materials (ANEM-2018),12th-14th December 2018, The University of Western Australia, Perth
35. **Kumar, S.,** Upadhyay, S. H., and Singh K.S.(2018), *Shape control analysis of inflatable membrane structures using an adaptive genetic algorithm*, 14th International Symposium on Materials in the Space Environment, 1^{st} -5^{th} October, 2018 Biarritz, France.
36. **Kumar, S.,** and Upadhyay, S. H. (2018). *New adaptive design of membrane based reflector for space application*, 4th International Conference and Exhibition on Satellite & Space Missions (Satellite-2018), 18^{th}-20^{th} June, 2018 Rome, Italy.
37. **Kumar, S.,** and Upadhyay, S. H. (2018). *Experimental verification of novel analytical wrinkling control mechanism of planar membrane reflector for space application*, 16th European Conference on Spacecraft Structures Materials and Environmental Testing, (ECSSMET-2018), 28^{th} May -1^{st}June, 2018, Noordwijk, Netherlands.
38. **Kumar, S.,** and Upadhyay, S. H. (2018). Cutting pattern analysis of parabolic inflatable reflector, 1^{st} research scholar day, (RSM-2018), 16^{th} May 2018, MIED, IIT Roorkee, India
39. **Kumar, S.,** and Upadhyay, S. H. (2017). *Analysis of Real Time Adaptive Control Mechanism for Space Antenna Reflector*. 19^{th} International Conference on Human-Robot Interaction (ICHRI-2017), 19^{th} - 20^{th}May, 2017, Dubai, UAE.
40. **Kumar, S.,** and Upadhyay, S. H. (2016). *A Numerical Method to Minimize the Wrinkles Formation on Space Inflatable Membrane Reflector,* International Conference on Aerospace Engineering (ICOAE-2016), 18^{th} -20^{th}, May 2016 Moscow, Russia.
41. **Kumar, S.,** and Upadhyay, S. H. (2016). *Wrinkling Prediction of Space-Based Membrane Reflector under Thermal and Mechanical Loading*. 14^{th}European Conference on Spacecraft Structures Materials and Environmental Testing, (ECSSMET-2016), 27^{th} -30^{th}, September 2016, Toulouse, France.
42. **Kumar, S.,** and Upadhyay, S. H. (2016). *Homogenization and Wrinkling Prediction Procedures to Optimize Inflatable Space Structures*. 4^{th}International Conference and Exhibition on Mechanical and Aerospace Engineering, 3^{rd} - 4^{th} October 2016, Orlando, Florida, USA.
43. **Kumar, S.,** and Upadhyay, S. H. (2016). *Nonlinear Vibration Analysis and Control of Thin Film Membrane Structure*. National Tribology Conference (NTC-2016), 8^{th}-10^{th}December 2016. IIT (BHU) Varanasi, India.

44. **Kumar, S.,** and Upadhyay, S. H. (2015). *Wrinkling Analysis of Small Diameter Membrane Reflector*. 12th International Conference on Vibration Problems (ICOVP - 2015), 14th -17th December 2015, IIT Guwahati, India.
45. **Kumar, S.,** and Upadhyay, S. H. (2015). *Shape Control of a Kapton Based Membrane Structures for Space Application*. 60th Congress (an International Conference) of Indian Society of Theoretical and Applied Mechanic (ISTAM - 2015), 16th -19th December 2015, MNIT Jaipur, India.

Patents

1. **Kumar, S**., Upadhyay, S. H., and Singh K.S. (2023), Adaptive shape control mechanismfor planar membrane structure (Indian Patent , patent number is 47058)
2. **Satish Kumar** and Kumari Pushpa. (2024), "A Highly Flexible Thin Membrane Singly Curved Cylindrical Parabolic Inflatable Antenna Reflector"(Indian Patent , filed on 19-05-2025, Application No.: 202511048183).
3. Avadesh Yadav, **Satish Kumar** and Abhishek Kumar "SMPC-Based Deployable Hinge with Spring-Assisted Pin-Locking System" , (Indian Patent , filed on 10-10-2025 Application No.: 202511097848).

Book Chapters

1. Siddiqui, A. A., Murari, V., & **Kumar, S.** (2022). Simulation of Deployment of Inflatable Structures Through Uniform Pressure Method. In Soft Computing in Materials Development and its Sustainability in the Manufacturing Sector (pp. 145-158). CRC Press.
2. Yadav A, Kumar A & **Kumar S** (2024). Analysis of Copper Reinforcement Effect on Epoxy-Based Shape Memory Polymer for Smart Actuators (Chapter 14), Lect. Notes Mechanical Engineering, Advances in Applied Mechanics, Springer Nature
3. Chandraul, A., Singh, P., Chilwal, A., Murari, V., & **Kumar, S**. (2025). Parametric Study for Modal Analysis of an Inflatable Torus. In Advanced Engineering and Sustainable Solutions (pp. 53-63). Cham: Springer Nature Switzerland.