List of Publications

Patents

1. **Kumar, S.,** Upadhyay, S. H., and Singh K.S. (2023), Adaptive shape control mechanism for 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).
4. Pradeep Singh and **Satish Kumar.** A DEPLOYABLE ANTENNA REFLECTOR SUPPORT SYSTEM" (Indian Patent , filed on 18-06-2026, Application no. 202611075784)

Publications

International Journal Articles

1. Pradeep Singh and **Satish Kumar**. "Thermally Actuated Nitinol SMA-Based Membrane Folding for Space Deployable Structures", *space safety engineering (Under Review)*
2. Pradeep Singh and **Satish Kumar.** "Inflation and Dynamic Analysis of Membrane-Based Inflatable Circular Torus." *sadhana (Under Review)*
3. Pradeep Singh and Satish Kumar. "Deployment Behavior of Kapton Used in Space Application with Shape Memory Alloy (Nitinol) by Thermal Loading." *National Academy Science Letters (Under Review)*
4. Amiy chandraul, Murari V, and **Satish kumar**, "Experimental and Numerical Investigation of the Deployment Behaviour of Inflatable Membrane Structures", International Journal of Space Structures. (Under Review)
5. Amrendra Kumar Singh, Abhishek Kumar, and Satish Kumar. "A review on the development of inflation and rigidization methods for inflatable space structures." International Journal of Space Structures. (Accepted)
6. 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]
7. Singh, A. K., Kumar, A., & **Kumar, S**. (2026). Experimental and Numerical Analysis of Novel Multi-layer Inflatable Boom Structure. Aerospace Science and Technology, Volume 178, Part B, 2026, 113064, ISSN 1270-9638,
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9. Yadav, A., **Kumar, S.,** & Kumar, A. (2026). Viscoelastic and stiffness modelling of CF dispersed shape memory epoxy composites: a deployable solar concept. Journal of Polymer Research, 33(3), 78.

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11. 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
12. 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
13. 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
14. 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
15. 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
16. 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.
17. 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.
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1. Pradeep Singh and **Satish Kumar**. “Design and Dynamic Analysis of Inflatable Smart Material Membrane Based Space Antenna," 7th Indian Conference on Applied Mechanics (INCAM 2026), IIT Kanpur, 9-11 July 2026.
2. Amrendra Kumar Singh, Abhishek Kumar, and **Satish Kumar**, "FiniteElement Investigation of Inflation Deployment in Thin-Film Metal–Polymer Laminated Inflatable Structures," 7th Indian Conference on Applied Mechanics (INCAM 2026), IIT Kanpur, 9-11 July 2026.
3. Amiy chandraul, Murari V, and **Satish kumar**, “Influence of Extreme On-Orbit Thermal Loading on the Modal Behaviour of Inflatable Space Torus”, 7th Indian Conference on Applied Mechanics (INCAM 2026), IIT Kanpur, 9-11 July 2026.
4. Amrendra Kumar Singh, Abhishek Kumar, and **Satish Kumar**. "InflationDeployment Study of Thin Film Laminate Boom for Space Applications."1st National Conference on Emerging Trends in Industrial Design &Manufacturing Systems (IDMS 2026), NIT Rourkela, April 9-10, 2026.
5. Avadesh Yadav, Sourabh Kumar Singh, **Satish Kumar** and Abhishek Kumar Shape Memory Behavior of Carbon Fiber Reinforced Bisphenol-A based Epoxy Composite” 10th International Congress on Computational Mechanics and Simulation (ICCMS 2025) organizing by Indian Institute of Technology Bhubaneswar, India during 17-19 December 2025.
6. Amiy Chandraul, Murari V, and **Satish Kumar**, “Deployment Simulation of Creased Membrane,” 10th International Congress on Computational Mechanics and Simulation (ICCMS 2025) organizing by Indian Institute of Technology Bhubaneswar, India during 17-19 December 2025
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8. Akanksha Singh, Avadesh Yadav, Abhishek Kumar and **Satish Kuma**r, “Design and Analysis of Shape Memory Polymer Based Self Expandable Biocompatible Stent”, in the 10^{th} International and 31^{st} All India Manufacturing Technology, Design & Research (AIMTDR 2025) Conference organized by IIT Indore, India held on 11^{th} -13^{th} December 2025

9. 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.
10. 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.
11. 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.
12. 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.
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15. 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.
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17. 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.

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21. 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.
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23. 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
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43. **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.
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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.
4. Amiy chandraul, Murari V, and **Satish kumar**, “Numerical Simulation of Inflatable Plugs for Tunnel Safety Applications”, Evolution in Fabrication and Manufacturing Process through Industry - Academia Partners in this Smart Era.
5. Amrendra Kumar Singh, and **Satish Kumar,** "Study of inflation deployment of thin film laminated boom," Evolution in Fabrication and Manufacturing Processes through Industry-Academia Partners in this Smart Era.
6. **Pradeep Singh** and Satish Kumar. “Numerical Analysis of Inflation and Dynamic Behaviour of Membrane Based Rectangular Torus.” Evolution in Fabrication and Manufacturing Process through Industry - Academia Partners in this Smart Era.