Rajesh Chaunsali

Curriculum Vitae

205, Department of Aerospace Engineering,
Indian Institute of Science, Bengaluru-560012

Phone: +91-80-2293-3028
Email: rchaunsali@iisc.ac.in

Research Interests

- Solid and Structural Mechanics
- Vibrations and Wave Physics
- Metamaterials and Lattice Structures
- Deployable Space Structures

Educational History

Ph.D., Aeronautics and Astronautics (2014–2018)
University of Washington, Seattle
Advisor: Prof. Jinkyu 'JK' Yang

B.Tech. & M.Tech., Mechanical Engineering (2007–2012)
Indian Institute of Technology Madras, Chennai
Minor in Physics

Employment History

Indian Institute of Science, Bengaluru
- Assistant Professor, Department of Aerospace Engineering (2021–present)

Laboratoire d'Acoustique Le Mans Université (LAUM), CNRS, Le Mans
- Postdoctoral Fellow (2018–2021)

University of Washington, Seattle
- Graduate Research Assistant (2015–2018)

GE Aerospace, Bengaluru
- Edison Engineer (2012–2014)

Awards and Honors

- **Young Associate**, Indian National Academy of Engineering (2024)
- **Visiting Fellow**, CNRS, France (2023, 2024)
- **Start-up Research Grant (SRG)**, Science and Engineering Research Board, India (2022)
- **Editor's Suggestion paper**, Physical Review Applied (2019)
- **Student Award Nominee: Research** for excellence in graduate research, College of Engineering, UW (2018)
- **Editor's Choice paper: Topological matter**, Scientific Reports (2018)
- **Student Research Representative**, AeroAstro Visiting Committee, UW (2016)

- **Student Award Nominee: Teaching**, one of four nominees for excellence in teaching assistantship, College of Engineering, UW (2016)
- **S. Rao and Usha Varanasi Fellowship**, AeroAstro, UW (2015)
- **Graduate School Top Scholar Award**, UW (2014)
- **LEAD Expo Winner**, General Electric (2013)
- **Undergraduate Research Fellowship**, Indian Institute of Science (2009)
- **Mathematics Olympiad**, Silver medal, Chennai Mathematical Institute (2009)
- **Merit Scholarship**, Central Board of Secondary Education (2007–2011)
- **Regional Mathematics Olympiad**, State Rank 5 (2006)

Publications

Refereed Archival Journal Publications

*Lab members and visiting scholars underlined; *Corresponding author; †Equally contributing first authors*

27. U. Vishwakarma, M. Irfan, G. Theocharis, **R. Chaunsali***, "Edge States with Hidden Topology in Spinner Lattices," *Communications Physics* 8, 83, 2025.

26. A. Ray†, S. Anand†, V. Dabade, **R. Chaunsali***, "Remote Nucleation and Stationary Domain Walls via Transition Waves in Tristable Magnetoelastic Lattices," *Physical Review Materials* 9, 014405, 2025.

25. K. Prabith, G. Theocharis, **R. Chaunsali***, "Nonlinear corner states in a topologically nontrivial kagome lattice," *Physical Review B* 110, 104307, 2024.

24. **R. Chaunsali***, P. G. Kevrekidis, D. Frantzeskakis, G. Theocharis, "Dirac Solitons and Topological Edge States in the β-Fermi-Pasta-Ulam-Tsingou dimer lattice," *Physical Review E* 108, 054224, 2023.

23. F. Allein†, A. Anastasiadis†, **R. Chaunsali**†, I. Frankel, N. Boechler, F. K. Diakonos, G. Theocharis, "Strain topological metamaterials and revealing hidden topology in higher-order coordinates," *Nature Communications* 14, 6633, 2023.

22. X. Shi, **R. Chaunsali**, G. Theocharis, H. Huang, R. Zhu, J. Yang, "Topological phase transition in disordered elastic quantum spin Hall system," *Physical Review B* 108, 054205, 2023.

21. Y. Miyazawa, C. Chen, **R. Chaunsali**, T. S. Gormley, G. Yin, G. Theocharis, J. Yang, "Topological state transfer in Kresling origami," *Communications Materials* 3, 1-10, 2022.

20. A. Anastasiadis, G. Styliaris, **R. Chaunsali**, G. Theocharis, and F. K. Diakonos, "Bulk-edge correspondence in the trimer Su-Schrieffer-Heeger model," *Physical Review B* 106, 085109, 2022.

19. B. M. Manda, **R. Chaunsali**, G. Theocharis, C. Skokos, "Nonlinear Topological Edge States: from Dynamic Delocalization to Thermalization," *Physical Review B* 105, 104308, 2022.

Prior to joining IISc:

18. X. Shi, I. Kiorpelidis, **R. Chaunsali**, V. Achilleos, G. Theocharis, J. Yang, "Disorder-induced topological phase transition in a one-dimensional mechanical system," *Physical Review Research* 3, 033012, 2021.

17. C. Chen†, **R. Chaunsali**†, J. Christensen, G. Theocharis, J. Yang , "Corner states in a second-order mechanical topological insulator," *Communications Materials* 2, 1, 2021.

16. **R. Chaunsali***, H. Xu, J. Yang, P. G. Kevrekidis, G. Theocharis, "Stability of topological edge states under strong nonlinear effects," *Physical Review B* 103, 024106, 2021.

15. **R. Chaunsali***, G. Theocharis, "Self-induced topological transition in phononic crystals by nonlinearity management," *Physical Review B* 100, 014302, 2019.

14. C. Chen, N. Lera, **R. Chaunsali**, D. Torrent, J. Vicente Alvarez, J. Yang, P. San-Jose, J. Christensen, "Mechanical analogue of a Majorana bound state," *Advanced Materials* 31, 1904386, 2019.

13. E. Kim, **R. Chaunsali**, J. Yang, "Gradient-index granular crystals: From boomerang motion to asymmetric transmission of waves," *Physical Review Letters* 123, 214301, 2019.

12. X. Shi, **R. Chaunsali**, F. Li, J. Yang, "Elastic Weyl points and surface arc states in three-dimensional structures." *Physical Review Applied* 12, 024058, 2019 **(Editor's Suggestion)**.

11. **R. Chaunsali**, C. Chen, J. Yang, "Experimental demonstration of topological waveguiding in elastic plate with local resonators," *New Journal of Physics* 20, 113036, 2018.

10. **R. Chaunsali**, E. Kim, J. Yang, "Demonstration of accelerating and decelerating nonlinear impulse waves in functionally graded granular chains," *Philosophical Transactions of the Royal Society A* 376 (2127), 20170136, 2018 **(invited)**.

9. X. Shi, **R. Chaunsali**, Y. Wu, J. Yang, "Elastic Wannier-Stark ladders and Bloch oscillations in 1D granular crystals," *Journal of Applied Physics* 123, 104904, 2018 **(invited)**.

8. **R. Chaunsali**, C. Chen, J. Yang, "Subwavelength and directional control of flexural waves in zone-folding induced topological plates," *Physical Review B* 97, 054307, 2018.

7. Y. Wu, **R. Chaunsali**, H. Yasuda, K. Yu, J. Yang, "Dial-in topological metamaterial based on bistable Stewart platform," *Scientific Reports* 8, 112, 2018 **(Editor's Choice)**.

6. **R. Chaunsali**, E. Kim, A. Thakkar, P. G. Kevrekidis, J. Yang, "Demonstrating an in situ topological band transition in granular crystals," *Physical Review Letters* 119, 024301, 2017.

5. **R. Chaunsali**, M. Toles, J. Yang, E. Kim, "Extreme control of impulse transmission by cylinder based nonlinear phononic crystals," *Journal of the Mechanics and Physics of Solids* 107, 21-32, 2017.

4. **R. Chaunsali**, H. Xu, J. Yang, P. G. Kevrekidis, "Linear and nonlinear dynamics of isospectral granular chains," *Journal of Physics A: Mathematical and Theoretical* 50, 175201, 2017.

3. **R. Chaunsali**, F. Li, J. Yang, "Stress wave isolation by purely mechanical topological phononic crystals," *Scientific Reports* 6, 30662, 2016.

2. E. Kim, **R. Chaunsali**, H. Xu, J. Castillo, J. Yang, P. G. Kevrekidis, A. F. Vakakis, "Nonlinear low-to-high frequency energy cascades in diatomic granular crystals," *Physical Review E* 92, 062201, 2015.

1. T. J. Royston, Z. Dai, **R. Chaunsali**, Y. Liu, Y. Peng, R. L. Magin, "Estimating material viscoelastic properties based on surface wave measurements: A comparison of techniques and modeling assumptions," *Journal of the Acoustical Society of America* 130 (6), 4126, 2011.

Other Scholarly Activity

Seminars and Invited talks

- *Indian Institute of Technology Kanpur*, Mechanical Sciences Young Investigators Meet, Kanpur, India, March 2025 (scheduled).
- *Seoul National University*, Seminar in the Department of Mechanical Engineering, Nov 2024.
- *Indian Institute of Technology Delhi*, Talk at Indo-German Science & Technology Centre (IGSTC) workshop, Delhi, Sept 2024.
- *Laboratoire d'Acoustique de l'Université du Mans (LAUM), CNRS*, France, Aug. 2024.
- *Laboratoire d'Acoustique de I'Universite du Maine (LAUM), CNRS*, Seminar at the 6th Local Symmetry Workshop, Le Mans, France, July 2023.
- *Mechanical Engineering, Indian Institute of Science*, Bengaluru, April 2022.
- *Indian Institute of Technology Gandhinagar*, Symposium on Applied Mechanics and Dynamics, March 2022.

- *Indian Institute of Technology Bombay*, Mumbai, March 2021.
- *University of Sheffield*, UK, Dec. 2020 (online).
- *Laboratoire d'Acoustique de l'Université du Mans (LAUM), CNRS*, France, Dec. 2020 (online).
- *Indian Institute of Technology Gandhinagar*, Dec. 2019.
- *Indian Institute of Space Science and Technology*, Thiruvananthapuram, Dec. 2019.
- *Indian Institute of Science Education and Research*, Thiruvananthapuram, Dec. 2019.
- *Indian Institute of Technology Madras*, Chennai, Nov. 2019.
- *Harbin Institute of Technology*, Harbin, China, Jun. 2018.
- *AeroAstro Review Committee*, University of Washington, Seattle, WA, Nov. 2016.

Conference presentations

17. "New tools to shape topological boundary states: hidden symmetry and nonlinearity," *Phononics 2025*, Seoul, Korea, June 2025 (scheduled).
16. "Remote Nucleation and Stationary Domain Walls in Tristable Magnetoelastic Lattices," *Indian Conference on Applied Mechanics (INCAM)*, Warangal, India, Jul. 2024 (invited).
15. "Nonlinear dynamics of topological Kagome lattice," *IUTAM Symposium on Nonlinear dynamics for design of mechanical systems across different length/time scales*, Tsukuba, Japan, Aug. 2023.
14. "Nonlinear Dynamics of Topological Lattices," *European Nonlinear Oscillations Conference*, Lyon, France, July 2022.
13. "Topological mechanics and nonlinearity," *American Physical Society*, Online, Mar. 2021.
12. "Self-induced topological transition in a nonlinear phononic lattice," *Metamaterials*, Rome, Italy, Sept. 2019.
11. "Dynamic topological transition in a nonlinear phononic lattice," *International Congress on Ultrasonics*, Bruges, Belgium, Sept. 2019.
10. "Self-induced topological transition in a nonlinear phononic lattice," *Phononics*, Tucson, AZ, June 2019.
9. "Topological manipulation of stress waves by tunable 1D and 2D mechanical structures," *IUTAM Symposium on Acoustic/elastic Metamaterials, Their Design and Applications*, Beijing, China, Jun. 2018 (invited).
8. "Subwavelength and directional topological waveguides in thin plates using pseudo spin Hall Effect," *American Physical Society*, LA, CA, Mar. 2018.
7. "Demonstrating in-situ topological band transition using highly tunable phononic crystals," *ASME-IMECE*, Tampa, FL, Nov. 2017.
6. "Extreme control of impulse transmission by cylindrical phononic crystals," *SIAM on Applications of Dynamical Systems*, Snowbird, UT, May 2017 (invited).
5. "Experimental verification of topological band-transition in one-dimensional phononic crystals," *SPIE-Smart Structures/NDE*, Portland, OR, Mar. 2017.
4. "Manipulation of elastic waves in graded mechanical metamaterials," *ASME-IMECE*, Phoenix, AZ, Nov. 2016.
3. "Acoustic non-reciprocator based on topologically non-trivial band-gaps," *ASME-IMECE*, Phoenix, AZ, Nov. 2016.
2. "Unique Impact Mitigation Mechanism in Granular Dimer Chains," *ASME-IMECE*, Houston, TX, Nov. 2015.
1. "Numerical and experimental verifications of resonance and anti-resonance phenomena in granular dimer chains," *ASME-McMat*, Seattle, WA, Jul. 2015.

Professional Society Memberships

- APS: American Physical Society (2021 –)
- ASME: American Society of Mechanical Engineers (2015–2017)
- SIAM: Society for Industrial and Applied Mathematics (2017–2018)

Archival Journal Reviews

- Acoustics
- APL Materials
- Applied Physics Letters
- Communications Physics
- Crystals
- Extreme Mechanics Letters
- International Journal of Mechanical Sciences
- Journal of Applied Mechanics
- Journal of Applied Physics
- Journal of the Acoustical Society of America
- Journal of the Mechanics and Physics of Solids
- Journal of Vibration and Acoustics
- Nature Communications
- New Journal of Physics
- Nonlinear Dynamics
- Physica Scripta
- Physical Review Applied
- Physical Review B
- Physical Review E
- Physical Review Letters
- Physical Review Materials
- Scientific Reports
- Smart Materials and Structures
- Ultrasonics

Students and Post-Docs

Chaired Doctoral Degrees

Student Name	**Dissertation Title**	**Completed Year**	**Current Employer**
G. S. Srikanth (AE)	Low-frequency bandgap metamaterials *PMRF Fellow*	Comprehensive Exam: 3/2024	IISc-AE
Samanvay Anand (AE)	Transition waves in magnetoelastic lattices (Co-advisor: Prof. V. Dabade)	Comprehensive Exam: 9/2023	IISc-AE
Harshith K. Sandhu (AE)	Dynamics of elastic time crystals	Comprehensive Exam: 6/2023	IISc-AE

Chaired Masters (Research) Degrees

Student Name	**Dissertation Title**	**Completed Year**	**Current Employer**
Udbhav Vishwakarma (AE)	Deformation-based Topological Lattices and their Edge States	11/2024	IISc-AE

Chaired Masters (Course) Degrees

Student Name	**Project Title**	**Completed Year**	**Current Employer**
Anshuman (AE)	Tunable Origami Structures		IISc-AE
Kapila Ramya Krishna (AE)	Analysis of structural vibration under hypersonic shock loading		IISc-AE
Panchal Anand Jayeshbhai (AE)	Origami-inspired bi-stable, inflatable, load Bearing deployable boom for space application	6/2024	IISc-AE
Govardhan K (AE)	Impact induced wave propagation in metamaterials	6/2024	IISc-AE

Post-doctoral Fellows Supervised

Name	Period	Current Employer
Prabith K	6/2022 – 12/2024	CNRS, France
Anusree Ray	6/2022 – 12/2024 Co-advisor: Prof. V. Dabade	University of Galway, Ireland

Visiting Scholars Supervised

Name	Period	Affiliation
Ankush Yadav	11/2023 – 2/2024	Graduate Student, Technion - Israel Institute of Technology

Undergraduate Interns Supervised (as a part of science outreach)

Name	Period	Affiliation
Avinash Umashankar	1/2024 – 5/2024	Sastra Deemed University
Vikramaditya Agrawal	5/2023 – 7/2023	NIT Tiruchirappalli
Vedant Vijaykrishnan	5/2023 – 7/2023	Manipal Institute of Technology

Teaching Experience

Indian Institute of Science (2021 – Present)

Course Number	Title	Semester	Registered	Responded	Course Evaluation	Instructor Evaluation
AE 291	*Nonlinear Dynamics*	Jan 2025	20			
AE 351A	*Wave Propagation in Designed Materials*	Jan 2025	8			
AE 211	*Mathematical Methods of Aerospace Engineers*	Aug 2024	44	24	4.54	4.50
AE 264	*Vibrations*	Jan 2024	3	2	4.50	4.50
AE 351A	*Wave Propagation in Designed Materials*	Aug 2023	9	9	4.82	4.67
AE 211	*Mathematical Methods of Aerospace Engineers*	Jan 2023	31	18	4.06	4.72
AE 211	*Mathematical Methods of Aerospace Engineers (online)*	Jan 2022	29	12	4.25	4.36

Scale: 0 (poor) to 5 (excellent).

Other Teaching Experience

- *Introduction to Nonlinear Vibrations and Waves*, Le Mans University (1/2020 – 3/2020)
- *Design of novel materials and structures: a fusion of art, mathematics, and science*, a study-abroad course at Queensland University of Technology, Brisbane, Australia (8/2018 – 9/2018)

Leadership and Service Activities

Department and Institute Service

Indian Institute of Science

- Senate Nominee in Department of Physics (1), Mechanical Engineering (1), Civil Engineering (1), Materials Engineering (1).
- PMRF Review Committee member for three students (excluding own students)

- Interview Panelist for incoming research students, Structures, IISc Aero, May 2024
- Faculty Organizer, Aerospace Research Students' Symposium (AERES), Jan 2024
- Library Committee member, 2024 – present
- Medal Committee member, IISc Aero, Dec 2023
- Faculty Organizer, Aerospace Research Students' Symposium (AERES), Jan 2023
- Interview Panelist for incoming research students, Structures, IISc Aero, May 2022
- Interview Panelist, Defense/DRDO sponsored MTech, May 2022
- Website Committee member, IISc Aero, 2022 – present
- Medal Committee member, IISc Aero, Dec 2021
- Interview Panelist for incoming research students, Structures, IISc Aero, Nov 2021

University of Washington

- Organizing and giving lab tours to external delegates in AeroAstro, UW
- Student Research Representative, AeroAstro Visiting Committee, UW
- RA/TA Panelist to welcome and council new graduates in AeroAstro, UW

Conference/Workshop Organizing Activities

- Session Chair, INCAM, Warangal, India, 2024
- Technical Committee member, SAEINDIA-AeroCON, Bengaluru, 2024
- Session Chair, IUTAM Symposium, Tsukuba, Japan, 2023

Science Outreach

- Two Frontiers in Aerospace Engineering: Origami and Metamaterials, IISc-Agastya Science Enrichment Program, 2024 (Lectured 40 selected high school students from various regions across India; mentored two students for a 2-week project)

External collaborators

- Georgios Theocharis, CNRS, France
- Panayotis Kevrekidis, University of Massachusetts, Amherst, USA
- Nicholas Boechler, University of California San Diego, USA
- Alexander Vakakis, University of Illinois, Urbana Champaign, USA
- Daniel Torrent, Universitat Jaume I, Spain
- Vassos Achilleos, CNRS, France
- Dimitri Frantzeskakis, National and Kapodistrian University of Athens, Greece
- Fotios Diakonos, National and Kapodistrian University of Athens, Greece
- Charalampos Skokos, University of Cape Town, South Africa
- Johan Christensen, Universidad Carlos III de Madrid, Spain
- Feng Li, Beijing Institute of Technology, China
- Eunho Kim, Jeonbuk National University, Republic of Korea

[Last updated: March 8, 2025. End of CV]