

Arun Kumar

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EXPERIENCE

**Marie Skłodowska-Curie Actions (Europostdoc2) postdoctoral fellow
at Ecole Polytechnique, Paris**

February 2022 – April 2024

Research work: Development of models and numerical implementations for predicting instabilities in thin structures

Advisors: Prof. Basile Audoly (Ecole Polytechnique, Paris), Prof. Pedro Reis (EPFL, Laussane)

Research Engineer at INRIA, Grenoble

September 2024 – June 2025

Research Focus: Mechanics of wisping and tangling of thin fibers

Collaborators: Dr. Florence Descoubes and Dr. Victor Romero

Research Verification Engineer II, Ansys France

July 2025 – September 2025

Mechanical APDL team

EDUCATION

Indian Institute of Science, Bengaluru, India

July 2016 – April 2022

PhD in Mechanical Engineering

Research Focus: Elastic ribbons —a ribbon model, numerical simulations, and experimental investigations.

Advisor: Prof. Ramsharan Rangarajan

National Institute of Technology, Calicut, India

July 2014 – June 2016

Master of Technology in Machine Design

Project: Frequency response of a base-excited cantilever in fluid medium

Jawaharlal Nehru Engineering College, Himachal Pradesh, India

July 2010 – June 2014

Bachelor of Technology in Mechanical Engineering

PUBLICATIONS

Wavelength selection in the twist buckling of pre-strained elastic ribbons,

A Kumar, B Audoly,

Journal of the Mechanics and Physics of Solids, <https://doi.org/10.1016/j.jmps.2024.106005>

A centerline model for bending-dominated configurations of elastic strips.

A Kumar, R Rangarajan,

Journal of Applied Mechanics <https://doi.org/10.1115/1.4069884>

Asymptotic derivation of a higher-order one-dimensional model for tape springs,
A Kumar, B Audoly, C Lestringant,
Philosophical Transactions of the Royal Society A, <https://doi.org/10.1098/rsta.2022.0028>

An investigation of models for elastic ribbons: Simulations & experiments,
A Kumar, P Handral, D Bhandari, A Karmakar, and R Rangarajan,
Journal of the Mechanics and Physics of Solids, <https://doi.org/10.1016/j.jmps.2020.104070>

More views of a one-sided surface: Mechanical models and stereovision techniques for Moebius strips,
A Kumar, P Handral, D Bhandari, and R Rangarajan,
Proceedings of the Royal Society A, <https://doi.org/10.1098/rspa.2021.0076>

On assembly of circular fibers
A Kumar, Victor Romero, Florence Descoubes
Manuscript under preparation

PRESENTATIONS AND TALKS

Ribbons and tape springs: structures not too narrow, not too wide; LMS, Ecole Polytechnique, April 2024

Asymptotically derived models for thin structures; poster presentation, Europostdoc2 boot camp, June 2022.

An experimental investigation of models for elastic ribbons, short talk and poster presentation at **ICTAM 2021**.

Mechanics of elastic ribbons, **Best poster award** — IISc Mechanical Engineering Symposium, 2019.

On the modeling of elastic ribbons, **INCAM 2019**, Bengaluru, India.

Stretching an annular ribbon. A short talk — *my thesis in 3 minutes* — at **INCAM 2019**.

AWARDS AND DISTINCTIONS

Recipient of Marie Skłodowska-Curie Actions (Europostdoc2) postdoctoral fellowship from February 2022 to April 2024.

Received first prize for our work in the **technical video contest** — IISc Mechanical Engineering Symposium, 2018.

Ranked 121 in CSIR NET 2014 (national exam for graduate students).

Silver medal (ranked second) in HIMUTKARSH 2006 talent search examination.
HIMUTKARSH is a state-level exam for school students.

Region topper, National Science Olympiad 2008.

Recipient of Himachal Pradesh education board merit scholarship (2006 – 2009).

TEACHING

Teaching Assistant, Finite Element Method

January – June 2020

IISc, Mechanical Engineering

Taught FEM implementation in C++.

Teaching Assistant, CAD Lab

Fall 2015

NIT Calicut, Mechanical Engineering

Taught CREO and SOLIDWORKS to undergraduate and first-year M.Tech students.

INTERNSHIPS

National Thermal Power Corporation, Kol Dam, Himachal Pradesh, India

June – July 2013

Simulated loading of vertical flood gates.

Hindustan Machine Tools, Pinjore, India

June 2012

Proposed design modifications for HMT's tractor trolley hook.

COMPUTING SKILLS

C++

Linux and MacOS

Abaqus, Ansys

FENICS

Experience with OpenMP and MPI

PETSc

Adobe Illustrator and Photoshop

Mathematica, Matlab

MANUSCRIPT REVIEWING

Journal of the Mechanics and Physics of Solids

Proceedings of the Royal Society A

European Journal of Mechanics - A/Solids

SIGGRAPH 2025

OTHERS

Outreach — Secretary at IISc SIAM student chapter

2019 – 2022

Organized yearly talks.

Redesigned postbox for India Post.

Minor project at NIT Calicut.

Co-edited Reflexia 2014, annual magazine of undergraduate college.

REFERENCES

Basile Audoly

Professor, Laboratoire de Mécanique des Solides, Ecole Polytechnique, Paris.

Email: basile.audoly@polytechnique.edu

Postdoc advisor

Ramsharan Rangarajan

Professor, Indian Institute of Science, Bangalore.

Email: rram@iisc.ac.in

PhD advisor