

Arun Kumar

Email: arun.kumar@polytechnique.edu
Alt. email: dzrarunkumar@gmail.com
Website: <https://arunkmaar.github.io>

EXPERIENCE

Marie Skłodowska-Curie Actions (Europostdoc2) Postdoctoral Fellow
at Ecole Polytechnique, Paris

February 2022 onwards

Research Focus: Models for predicting instabilities in thin structures

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

EDUCATION

Indian Institute of Science, Bengaluru, India

July 2016 – April 2022

PhD in Mechanical Engineering

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

Advisor: Prof. Ramsharan Rangarajan

National Institute of Technology, Calicut, India

July 2014 – June 2016

Master of Technology in Machine Design

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

Jawaharlal Nehru Engineering College, Himachal Pradesh, India

July 2010 – June 2014

Bachelor of Technology in Mechanical Engineering

PUBLICATIONS

Asymptotic derivation of a higher-order one-dimensional model for tape springs,

A Kumar, B Audoly, C Lestringant.

Proceedings 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>

Single and multiple perversions twisting instabilities in prestrained ribbons.

Manuscript in preparation.

PRESENTATIONS AND TALKS

Asymptotic exact models for thin structures; poster presentation, Europostdoc2 boot camp, June 2022.

An experimental investigations 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 among 1.3 lakh students 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 EXPERIENCE

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

OTHERS

Secretary at IISc SIAM student chapter

2019 – 2022

Organized yearly talks.

Outreach — Redesigned postbox for India Post.

Minor project at NIT Calicut.

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

REFERENCES

Basile Audoly

Postdoc advisor

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

Email: audoly@lmm.jussieu.fr

Ramsharan Rangarajan

PhD advisor

Associate Professor, Mechanical Engineering, IISc Bengaluru.

Email: rram@iisc.ac.in