

# Arun Kumar

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## EXPERIENCE

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**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

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**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

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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

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Asymptotically derived 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

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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

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### 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

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### 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

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C++  
Linux and MacOS  
Abaqus, Ansys  
FENICS

Experience with OpenMP and MPI  
PETSc  
Adobe Illustrator and Photoshop  
Mathematica

## MANUSCRIPT REVIEWING

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Journal of the Mechanics and Physics of Solids  
Proceedings of the Royal Society A

## OTHERS

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**Outreach** — Secretary at IISc SIAM student chapter  
Organized yearly talks.

*2019 – 2022*

Redesigned postbox for India Post.  
Minor project at NIT Calicut.

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

## REFERENCES

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Basile Audoly  
Professor, Laboratoire de Mécanique des Solides, Ecole Polytechnique, Paris.  
Email: [audoly@lmm.jussieu.fr](mailto:audoly@lmm.jussieu.fr)

*Postdoc advisor*

Ramsharan Rangarajan  
Associate Professor, Mechanical Engineering, IISc Bengaluru.  
Email: [rram@iisc.ac.in](mailto:rram@iisc.ac.in)

*PhD advisor*