

HARMEET SINGH

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Postdoctoral associate, Institute of Mathematics, EPFL

RESEARCH INTERESTS

Classical mechanics, geometry, dynamics of thin bodies, elasticity.

EDUCATION

Virginia Tech, Blacksburg, VA. Ph.D., Engineering Mechanics, Dec. 2018.

Thesis: *Discontinuities, Balance Laws, and Material Momentum*. Advisor: James Hanna.

I.I.T. Kharagpur, West Bengal, India. M.Tech., Structural Engineering, Aug. 2012.

Thesis: *Nonlinear Vibrations of Circular Cylindrical Shells*. Advisor: Lingadahally Ramachandra.

G.B.P.U.A.&T., Uttarakhand, India. B.Tech., Civil Engineering, May 2010.

Senior project: *Design of an R.C.C. T-Beam bridge for a single lane of 18 meters span on Bhakra river*.

Advisor: Virendra Kumar.

PROFESSIONAL EXPERIENCE

École Polytechnique Fédérale de Lausanne, Postdoctoral Associate (*Collaborateur Scientifique*), Institute of Mathematics, Feb. 2019 - present.

Advisor: John H. Maddocks.

Airbus India, Bangalore, Associate Engineer, Structures, July 2012 - July 2014.

Nonlinear finite element analysis on parts of A320 and A350 aircraft.

Received quarterly and annual awards for contributions to the A350-900 *Virtual Full Scale Testing* project.

PUBLICATIONS

T. Elder, T. Twohig, H. Singh, and A. B. Croll. Adhesion of a tape loop. *Soft Matter*, DOI: 10.1039/d0sm01516d.

P. Grandgeorge, C. Baek, H. Singh, P. Johanns, T. G. Sano, A. Flynn, J. H. Maddocks, and P. M. Reis. Mechanics of two filaments in tight contact: The orthogonal clasp. [arXiv:2010.08773].

H. Singh, and J. A. Hanna. Pseudomomentum: origins and consequences. [arXiv:2007.06023].

N. A. Corbin, J. A. Hanna, W. R. Royston, H. Singh, and R. B. Warner. Impact-induced acceleration by obstacles. *New Journal of Physics*, 20:053031, 2018.

Perspective – Acquiring momentum: simple strategies by simple objects.

J. A. Hanna, H. Singh, and E. G. Virga. Partial constraint singularities in elastic rods. *Journal of Elasticity*, 133:105–118, 2018.

H. Singh, and J. A. Hanna. On the planar elastica, stress, and material stress. *Journal of Elasticity*, 136:87–101, 2019.

H. Singh, and J. A. Hanna. Pick-up and impact of flexible bodies. *Journal of the Mechanics and Physics of Solids*, 106:46–59, 2017.

PRESENTATIONS

Invited Talks

Indian Institute of Technology, Department of Mechanical Engineering, Kanpur, “Material momentum and elastic rods”, Dec 2019.

Indian Institute of Technology, Department of Mechanical Engineering, Kanpur, “Pick-up and impact”, Dec 2016.

Talks

American Physical Society Division of Fluid Dynamics, “Impulse and material symmetry”, Atlanta, GA, November 2018.

Fall Fluid Mechanics Symposium, Virginia Tech, “Impulse and material symmetry”, Blacksburg, VA, November 2018.

United States Congress of Theoretical and Applied Mechanics, “Material symmetry and conservation laws”, Chicago, IL, June 2018.

American Physical Society March Meeting, “Material symmetry and conservation laws”, Los Angeles, CA, 2018.

Society of Engineering Science, “Geometric singularities in the mechanics of rods”, Boston, MA, July 2017.

American Physical Society March Meeting, “Geometric singularities in the mechanics of strings and rods”, New Orleans, LA, 2017.

Society of Engineering Science, “Pick-up, impact, and peeling”, College Park, MD, Oct 2016.

International Congress of Theoretical and Applied Mechanics, “Pick-up, impact, and peeling”, Montreal, Aug 2016.

American Physical Society March Meeting, “Pick-up, impact, and peeling”, Baltimore, MD, 2016.

Virginia Soft Matter Workshop, “Pick-up, impact, and peeling”, Charlottesville, VA, Nov 2015.

Posters

Center for Soft Matter and Biological Physics Symposium, “Pick-up, impact, and peeling”, Blacksburg, VA, May 2016.

Summer School on Soft Matter and Complex Fluids, “Pick-up, impact, and peeling”, Amherst, MA, May 2016.

Dynamics Days, “Pick-up, impact, and peeling”, Durham, NC, Jan 2016.

AWARDS

The Amir Chand and Dewki Bai Batra Scholarship, Engineering Science and Mechanics program, Virginia Tech., Spring 2018.

TEACHING EXPERIENCE

Teaching Assistant

MATH 111 - Linear Algebra, Institute of Mathematics, EPFL, Autumn 2019.

ESM 5014 - Introduction to Continuum Mechanics, Department of Biomedical Engineering and Mechanics, Virginia Tech, Fall 2018.

ESM 2024 - Mechanics of Deformable Bodies, Department of Biomedical Engineering and Mechanics, Virginia Tech, Fall 2018.

ESM 2304 - Dynamics, Department of Biomedical Engineering and Mechanics, Virginia Tech, Spring 2015.

ESM 2104 - Statics, Department of Biomedical Engineering and Mechanics, Virginia Tech, Fall 2014.

Lectures

Multiple lectures on Linear Algebra as teaching assistant, EPFL, Oct-Nov 2019.

A guest lecture entitled *Noether's theorem in classical mechanics* for a senior level class on nonlinear dynamics and chaos, Virginia Tech, Mar 2017.

ADDITIONAL INFORMATION

Member of the American Physical Society.

Regular attendee of the Society of Engineering Science Technical Meeting and the American Physical Society March Meeting.

Attended a summer school on Soft Solids and Complex Fluids at the University of Massachusetts, Amherst, 2016.