Jyoti Sharma, PhD

Postdoctoral Fellow

Personal Info

Microscale Robotics Lab,
Biorobotics Institute,
Sant'Anna, Pontedera, Pisa,
56025, Italy

Jyoti.Sharma@santannapisa.it

Nationality
Indian

Date of birth
30-11-1991

Links

Webpage

LinkedIn

Twitter

Google Scholar

Skills

Experiments- (i) Camphor rotors (ii)Janus active particles (iii) Active droplets

Fabrication -- Micro(3um and 10um) sized Janus particles

Fabrication -- Micro ellipses using PDMS

Simulation-- ODE (in C), Active Brownian particles in curved geometries(in Julia)

Image analysis-- ImageJ, MATLAB, Julia

Research interest

After earning my Ph.D from the Department of Physics, IIT Bombay, India, I moved to the Biorobotics Institute at Sant'Anna, Pisa, Italy, for a postdoctoral fellowship. During my PhD thesis, I extensively worked on self-propelled artificial swimmers known as camphor rotors. These centi-metre-sized self-moving particles interested me in the active matter at small scales. Currently, at the Microscale Robotics laboratory, I am exploring micron-sized particles from the microscope's lens. I am keen to know the self-organization of Janus colloids in the microchambers and the effect of the curved micro confinement on their dynamics. I am using Microfabrication techniques for the experiments and Active Brownian particle simulations in Julia to answer this question.

Education

PhD, Indian Institute of Technology, Bombay
January 2015 - September 2020

M.Sc, Punjabi University
May 2013

B.Sc, Panjab University
May 2011

Research Experience

Postdoctoral Fellow, Biorobotic Institute, Sant'Anna, Pisa, Italy
August 2022 - Present

Postdoctoral Fellow, IIT Bombay, Mumbai, India
October 2021 - July 2022

Research Associate, IIT Bombay, Mumbai, India
May 2021 - September 2021

Teaching Experience

Assistant Professor, Dev Samaj College for Women, Punjab, India
2013 - 2014

Guest Lecturer, HKL Group of Institutes, Punjab, India
October 2014 - December 2014

Teaching Assistant, Department of Physics, IIT Bombay, India
July 2016 - May 2019

Publication

Instruments handled -- (i) GoPro camera (ii) Function generator (iii) Oscilloscope (iv) Optical Microscope (v) Phase contrast Microscope (vi) Scanning Electron Microscope (vii) Sputtering Machine (viii) Plasma cleaner (ix) Spin coater (x) Optical Microscope (xi) Phase contrast microscope

Programming Languages -- Julia, C, MATLAB

Software: MS Office, MS Powerpoint, MS Excel, MS Teams, Texmaker, Latex, Markdown, Visual Studio Code

Operating systems-- Windows, Ubuntu

Teaching-- Undergraduates, High School students

Web designing -- HTML, CSS

Languages

Punjabi

English

Hindi

Italian

1) "In-phase and mixed-phase measure synchronization of camphor rotors" Rishabh Jain, Jyoti Sharma*, Ishant Tiwari, Sangeeta D.Gadre, Suresh Kumarasamy, P. Parmananda and Awadesh Prasad
2023
Under Review

2) "Generation of aperiodic motion due to the sporadic collisions of camphor rotors" Rishabh Jain, Jyoti Sharma*, Ishant Tiwari, Sangeeta D.Gadre, Suresh Kumarasamy, P. Parmananda and Awadesh Prasad
2022
Phys. Rev. E 106, 024201

3) "Aperiodic bursting dynamics of camphor rotors" Jyoti Sharma*, Ishant Tiwari, M. Rivera and P. Parmananda
2022
Phys. Rev. E 105, 014216

4) "Chimera like states in a minimal network of active camphor ribbons" Jyoti Sharma*, Ishant Tiwari, Dibyendu Das and P. Parmananda
2021
Phys. Rev. E 103, 012214

"Rotational synchronization of camphor ribbons in different geometries" Jyoti Sharma*, Ishant Tiwari, Dibyendu Das, P. Parmananda and Veronique Pimienta
2020
Phys. Rev. E 101, 052202

6) "Rotational synchronization of camphor ribbons" Jyoti Sharma*, Ishant Tiwari, Dibyendu Das, P. Parmananda, V. S. Akella, and Veronique Pimienta
2019
Phys. Rev. E 99, 012204

Conference/School

Interdisciplinary challenges: from non-equilibrium physics to life sciences, Rome, Italy
2023
Poster Presentation

Cell mimicry: bottom-up engineering of life, The Royal Society, London, UK
2022
Online participation

CMD29 (Hybrid), Division: Emergent Phenomenon in Driven Soft, Active and Biological Matter, Manchester, UK
2022
Contributed oral presentation

ICSTCF (Online), University of Guanajuato, Mexico
2022
Contributed oral presentation

SMYIM (online), Department of Physics, IIT Bombay, India
2021

Oral presentation

SYMPHY, Department of Physics, IIT Bombay, India
2020

Poster cum snapshot presentation

Complex Dynamical Systems and Applications (CDSA), Central University, Rajasthan, India
2020

Poster cum snapshot presentation

SYMPHY, IIT Bombay, India
2019

Oral presentation

Conference on Non-Linear Systems and Dynamics (CNSD), IIT Kanpur, India
2019

Poster presentation

CNSD, JNU, New Delhi, India
2018

Poster presentation

Hands-On Research in Complex Systems School, International Centre for Theoretical Physics (ICTP), Trieste, Italy
2018

Poster cum snapshot presentation

Bangalore School of Statistical Physics, International Centre for Theoretical Sciences (ICTS), Bangalore, India
2018

Participation

CDSA, IIT Guwahati, India (2017)
2017

Poster presentation

Awards and Achievements

Best poster award, SYMPHY, IIT Bombay, India
2020

Second position in an oral presentation, SYMPHY, IIT Bombay, India
2019

Outstanding poster award, Hands-On Research in Complex systems School, ICTP, Trieste, Italy
2018

Qualified GATE - All India Rank 304
2014

Second position in Punjabi University, Patiala in M.Sc Physics
2013

Second position in Panjab University, Chandigarh in B.Sc
2011

Scholarships

Teaching Assistantship (TA), IIT Bombay, India
2015 - 2019

Department of Physics scholarship, Punjabi University, Patiala
2012

INSPIRE(SHE) scholarship, Department of Science and Technology (DST), India
2010

Academic services

Reviewer, Physical Review E (PRE)
Present

Junior Reviewer, Scientific Reports
2021

AURAA-Department representative, PG Academic council, IIT, Bombay
August 2015 - July 2016

Organizing members , SYMPHY, Department of Physics, IIT Bombay
2016

Fee concession committee member, Department of Physics, Punjabi University, Patiala, India
2012