

# Mahashweta Patra

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Department of Applied Mechanics  
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**Affiliation**      **Postdoctoral Researcher, Department of Applied mechanics**  
Indian Institute of Technology-Madras  
(2019 September-present),

**Research Interests**      **Applied Mathematics, Nonlinear Dynamics, Climate modelling**  
  
**Stochasticity, Piecewise smooth systems, Global Bifurcations**

**Education**      **Indian Institute of Science Education and Research-Kolkata**  
PhD Degree, Department of Physical Sciences,  
(2014 August-2019 April),  
  
**Indian Institute of Science Education and Research-Kolkata, India**  
Masters degree in Physics (2012-2014)  
  
**Visva Bharati University, India**  
Bachelor degree in Physics (2009-2012)

**Dissertation**      *Global Bifurcations in Three Dimensional Piecewise Linear Maps*  
Department of Physical Sciences, IISER-Kolkata  
**PhD Completion:** April, 2019  
**Topic:** Nonlinear Dynamics  
**Supervisor:** Soumitro Banerjee (email id: soumitro@iiserkol.ac.in )

**Publications**

- ▶ **Mahashweta Patra**, Sayan Gupta and Soumitro Banerjee, “Local and Global Bifurcations in Three-dimensional Piecewise Smooth Discontinuous Maps” Chaos (under review)
- ▶ **Mahashweta Patra** and Soumitro Banerjee, “Hyperchaos in Three-dimensional Piecewise Linear Maps”, Chaos, Solitons and Fractals 133 (2020):109681
- ▶ Indrava Roy, **Mahashweta Patra**, and Soumitro Banerjee, “Shilnikov Chaos in Three-dimensional Piecewise Linear Maps”, Chaos, Solitons and Fractals, 133 (2020): 109655
- ▶ **Mahashweta Patra** and Soumitro Banerjee, “Robust Chaos in 3-D Piecewise Linear Map”, Chaos 28.12 (2018): 123101
- ▶ **Mahashweta Patra**, “Multiple Attractor Bifurcation in Three-dimensional Piecewise Linear Maps”, International Journal of Bifurcation and Chaos 28.10 (2018): 1830032

## Publications

- ▶ **Mahashweta Patra** and Soumitro Banerjee. “Bifurcation of Quasiperiodic Orbit in a 3-D Piece-wise Linear Map”, *International Journal of Bifurcation and Chaos* 27.10 (2017): 1730033
- ▶ Adhyapok, Priyom, **Mahashweta Patra**, and Soumitro Banerjee. “The Behavior of Synchronized Frequency in Weakly Coupled Nonidentical Periodic Oscillators.”, *International Journal of Bifurcation and Chaos* 27.01 (2017): 1750008

## Conferences Attended

- ▶ Saranya Biswas, **Mahashweta Patra**, Sayan Gupta, “Effect of parametric noise on the dynamics of lower order climate model”, ENOC, Lyon, France, (2020)
- ▶ **Mahashweta Patra**, Sayan Gupta, “Bifurcations in Three Dimensional Piecewise Smooth Discontinuous maps”, Conference on Nonlinear Systems and Dynamics (CNSD), IIT-Kanpur, India (December 2019)
- ▶ **Mahashweta Patra**, Atrayee Sarkar and Soumitro Banerjee, “An Algorithm to Draw Stable Manifold in Noninvertible Maps”, Conference on Nonlinear Systems and Dynamics (CNSD), JNU India (October 2018)
- ▶ **Mahashweta Patra** and Soumitro Banerjee, “Robust Chaos in 3-D Piecewise Linear Map”, Dynamics Days (University of Colorado Boulder, Denver January 2018)
- ▶ **Mahashweta Patra** and Soumitro Banerjee, “Robust Chaos in 3D Piecewise Linear Maps.”, Complex Dynamical Systems and Applications (CDSA), (IIT-Guwahati (December 2017))
- ▶ Soumitro Banerjee and **Mahashweta Patra**, “Bifurcations of Invariant Tori in 3-Dimensional Piecewise Smooth Maps.”, Society for Industrial and Applied Mathematics (SIAM), (Snowbird, Utah (May 2017))
- ▶ **Mahashweta Patra** and Soumitro Banerjee, “Quasiperiodic Bifurcation in 3D Piece-wise Linear maps.”, Conference on Nonlinear Systems and Dynamics (CNSD), IISER Kolkata (December 2016)
- ▶ **Mahashweta Patra** and Soumitro Banerjee, “The behavior of synchronized frequency in weakly coupled Non-identical oscillators.”, Complex Dynamical Systems and Applications (CDSA), (NIT-Durgapur (February 2016)
- ▶ **Mahashweta Patra** and Soumitro Banerjee, “Synchronization in a resistive and environmentally coupled electronic circuit.”, Conference on Nonlinear Systems and Dynamics (CNSD), IISER Mohali (March 2015)

## Workshops Attended

- ▶ “Indo-Poland joint workshop”, Indian Institute of technology Madras and Lublin University of Technology, Chennai India (February 2020).
- ▶ “Dynamics of Complex Systems (DCS)”, International Center for Theoretical Sciences, Bangalore, India (June 2018).
- ▶ “Winter School on Nonlinear Dynamics (WSND)”, Indian Statistical Institute Kolkata, India (December 2015).
- ▶ “Hands-on School on Nonlinear Dynamics (HSND)”, Institute for Plasma Research, Gandhinagar, India (February 2015).

## Visiting Position

### Short visits at other research groups

Institute of Mathematical Sciences, Chennai, India (Invited by Prof. Indrava Roy)

## Academic Achievements

- ▶ I have got SERB, DST Travel Grant Award for presenting work in the conference in Dynamics Days, 2018.
- ▶ Qualified National Eligibility Test (NET) with Lectureship.
- ▶ Qualified Graduate Aptitude Test (GATE) in 2014.

## Teaching Experiences

### ▶ August, 2014-July, 2018

Assisted faculty in teaching and laboratory experiments for six semesters at Indian Institute of Sciences Research and Education, Kolkata in India.

#### Courses assisted:

1. Python    2. Electronics Theory    3. Electronics Laboratory    4. Physics-1  
5. Basic Quantum Mechanics    6. Intermediate Quantum Mechanics

## Computer Science Skills

**Language:** Matlab, Octave, Python, Mathematica, C, Fortran,

**Software:** Dynamics, AnT

**Operating Systems:** Linux, Windows

## Researcher Id:

### ▶ Google-Scholar Page:

<https://scholar.google.co.in/citations?user=KitzeHQAAAAJ&hl=en&oi=ao>

## References

- ▶ Prof. Sayan Gupta (Postdoc Supervisor)  
Department of Applied Mechanics  
IIT-Madras, Chennai, India  
email: sayan@iitm.ac.in
  
- ▶ Prof. Soumitro Banerjee (PhD Supervisor)  
Department of Physical Sciences (DPS)  
Indian Institute of Science Education & Research (IISER) Kolkata  
Mohanpur-741246, West Bengal, India  
email:soumitro@iiserkol.ac.in
  
- ▶ Prof. Indrava Roy (Collaborator)  
Department of Mathematical Science  
Institute of Mathematical Science (IMSc) Chennai, India  
email: indrava@imsc.res.in
  
- ▶ Prof. Anandamohan Ghosh (M.Sc Course Supervisor)  
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