

# DR. DIBAKAR GHOSH

Assistant Professor

Physics and Applied Mathematics Unit

**Indian Statistical Institute**

203 B. T. Road, Kolkata 700108, India.

Mobile: +91-9883285599

E-Mail: [diba.ghosh@gmail.com](mailto:diba.ghosh@gmail.com)

[dibakar@isical.ac.in](mailto:dibakar@isical.ac.in)

## Academic Career

- ⇒ 2009: **Ph D in Science**, Jadavpur University, Kolkata, India.
- ⇒ 2004-2006 : Worked as a **Junior Research Fellow** under a UGC-CSIR in Department of Physics, Jadavpur University, Kolkata, India.
- ⇒ 2004: **M. Sc. in Applied Mathematics** from University of Calcutta, Kolkata with specialization in Advanced Mathematical Ecology.
- ⇒ 2002: **B.Sc. (Mathematics)** from Barackpur Rastraguru Surendranath College under University of Calcutta.
- ⇒ 1998: **Higher Secondary Examination** from Haracknagar A. M. Institution, Beldanga, Murshidabad with Board W.B.C.H.S.E.
- ⇒ 1996: **Secondary Examination** from Haracknagar A. M. Institution, Beldanga, Murshidabad with Board W.B.B.S.E.

## Teaching Experience

1. Assistant Professor in Physics and Applied mathematics Unit, Indian Statistical Institute, Kolkata  
From August, 2012 to present.
2. Assistant Professor in Mathematics, University of Kalyani, West Bengal-741235  
From April, 2012 to July, 2012.
3. Assistant Professor in Mathematics, Dinabandhu Andrews College, Garia, Kolkata-700084  
From 2006 to 2012.

## Research Areas

1. **Dynamical Systems and its chaotic properties**
  - i) Stability analysis (local and global stability)
  - ii) Control of chaos using different methods
  - iii) Bifurcation
2. **Time delayed systems and its properties**
  - i) Local and global stability analysis
  - ii) Lyapunov exponents for delay dynamical systems
  - iii) Modulated time delay
  - iv) Bifurcation and chaos control
3. **Chaos synchronization and its applications**
  - i) Different types of synchronization
  - ii) Cryptography using synchronization
  - iii) Chaos control using synchronization
4. **Time-delayed Complex network**
  - i) Dynamical behaviour
  - ii) Chaos synchronization

## Publications

### 2015

- 1) S. K. Bhowmick, B. K. Bera and **Dibakar Ghosh**: "Generalized counter-rotating oscillators: Mixed synchronization", ***Communication in Nonlinear Science and Numerical Simulations***, **22**, 692-701, 2015.
- 2) **Dibakar Ghosh** and Barnana Roy: "Nonlinear dynamics of classical counterpart of the generalized quantum nonlinear oscillator driven by position dependent mass", ***Annals of Physics***, **353**, 222-237, 2015.

## 2014

- 3) S. K. Bhowmick, **Dibakar Ghosh**, P. Roy, S. K. Dana, K. Murali, and S. Sinha,  
**International Journal of Bifurcation and Chaos**, **24(2)**, 1450014-1–1450014-9, 2014.

## 2013

- 4) **Dibakar Ghosh** and S. Banerjee,  
"Projective synchronization of time-varying delayed neural network with adaptive scaling factors"  
**Chaos, Solitons & Fractals**, **53**, 1-9, 2013.
- 5) A. Ray, A. Roy Chowdhury and **Dibakar Ghosh**,  
"Effect of noise on chaos synchronization in time-delayed systems: Numerical and experimental observations",  
**Physica A**, **392**, 4837-4849, 2013.
- 6) S. K. Bhowmick, **Dibakar Ghosh**, P. K. Roy, J. Kurths and S. K. Dana,  
"How to induce multiple delays in coupled chaotic oscillators?",  
**Chaos**, **23**, 043115-1--043115-7, 2013.

## 2012

- 7) S. K. Bhowmick, C. Hens, **Dibakar Ghosh** and S.K.Dana,  
"Mixed synchronization in chaotic oscillators using scalar coupling"  
**Physics Letters A**, **376(36)** (2012) 2490-2495.
- 8) **Dibakar Ghosh**, Ioan Grosu and S. K. Dana,  
"Design of coupling for synchronization in time-delayed systems"  
**CHAOS**, **22** (2012) 033111.
- 9) R. Banerjee, **Dibakar Ghosh**, E.Padmanaban, L.M.Pecora, R. Ramaswamy and S.K.Dana,  
"Enhancing synchrony in chaotic oscillators by dynamical relaying"  
**Physical Review E**, **85(2012)**, 027201.

## 2011

- 10) P. Saha, **Dibakar Ghosh**, A. Roy Chowdhury,  
"Modified projective Synchronization of different order chaotic system with adaptive scaling factor"  
**International Journal of Applied Nonlinear Science**(2011) Accepted.
- 11) **Dibakar Ghosh** and Bidyut K. Bhattacharyya,  
"Generalized synchronization-based multiparameter estimation in modulated time-delayed systems"  
**AIP Advances**, **1(2011)**032144.
- 12) S.K.Bhowmick, **Dibakar Ghosh**, S. K. Dana,  
"Synchronization in counter-rotating coupled oscillators"  
**CHAOS**, **21(2011)** 033118.
- 13) **Dibakar Ghosh**,  
"Projective-dual synchronization in delay dynamical systems with time-varying coupling delay"  
**Nonlinear Dynamics** , **66(4)(2011)**,717-730.
- 14) S. Banerjee, A. Das, **Dibakar Ghosh**, M. Mitra and A.Roy Chowdhury  
" Existence of Hyperchaos and its Control in Kuramoto-Shivashinky Equation"  
**International Journal of Nonlinear Science**,**11(3)(2011)**338-347.
- 15) A. Mukherjee, **Dibakar Ghosh** and S. Banerjee,  
"Synchronization of time delayed systems by common delay time modulations"  
**ISRN Applied Mathematics**, Volume 2011, Article ID 218458, 8 pages. DOI:10.5402/2011/218458.

## 2010

- 16) **Dibakar Ghosh**, A. Ray and A. Roy Chowdhury,  
"Heteroclinic orbit, Forced Lorenz system and Chaos"  
**ASME, Journal of Computational and nonlinear dynamics**, **5** (2010) 011008.
- 17) **Dibakar Ghosh**, P. Saha and A. Roy Chowdhury,  
" Linear observer based projective synchronization in delay Rossler system "  
**Communication in Nonlinear Sciences and Numerical Simulation**, **15(2010)** 1640-47.
- 18) **Dibakar Ghosh**

"Nonlinear active observer based generalized synchronization in time delayed systems"  
**Nonlinear Dynamics, 59 (2010)289-296.**

- 19) **Dibakar Ghosh** and Sikha Bhattacharya  
"Projective synchronization of new hyperchaotic system with fully unknown parameters"  
**Nonlinear Dynamics, 61(2010)11-21.**
- 20) **Dibakar Ghosh** and A. Roy Chowdhury,  
"Lag and anticipatory synchronization based parameter estimation scheme in modulated time delayed systems"  
**Nonlinear Analysis: Real World Applications, 11(2010)3059-3065.**
- 21) **Dibakar Ghosh** and A. Roy Chowdhury,  
"Nonlinear observer-based impulsive synchronization in chaotic systems with multiple attractors"  
**Nonlinear Dynamics, 60(4) (2010)607-613.**
- 22) **Dibakar Ghosh** and A. Roy Chowdhury,  
"Parameter estimation of delay dynamical system from a scalar time series under external noise"  
**Applied Mathematics and Computation, 216(2010)2069-2076.**
- 23) **Dibakar Ghosh** and A. Roy Chowdhury,  
"Dual-anticipating, dual and dual-lag synchronization in modulated time-delayed systems",  
**Physics Letters A, 374(2010)3425-3436.**
- 24) **Dibakar Ghosh,**  
"Projective synchronization in multiple modulated time-delayed systems with adaptive scaling factor"  
**Nonlinear Dynamics, 62(4)(2010)751-759.**
- 25) **Dibakar Ghosh,** Santo Banerjee, and A. Roy Chowdhury,  
"Generalized and projective synchronization in modulated time delayed systems"  
**Physics Letters A, 374 (2010)2143-2149.**
- 26) **Dibakar Ghosh,**  
"Erratum:Generalized projective synchronization in time-delayed systems—Nonlinear observer approach"  
**CHAOS, 20(2010)029902.**
- 27) **Dibakar Ghosh** and S. Banerjee,  
"Exponential stability criterion for chaos-synchronization in modulated time-delayed systems"  
**Nonlinear Analysis Series B: Real World Applications, 11(2010)3704-3710.**

**2009**

- 28) **Dibakar Ghosh,**  
"Generalized projective synchronization in time-delayed systems—Nonlinear observer approach"  
**CHAOS, 19(2009)013102.**
- 29) **Dibakar Ghosh,**  
"Stability and projective synchronization in multiple delay Rossler system"  
**International Journal of Nonlinear Science, Vol.7, No. 2 (2009)207-214.**
- 30) **Dibakar Ghosh,**  
"Time scale synchronization between two different time-delayed systems"  
**Electronic Journal of Theoretical Physics, 6(21) (2009)125-138.**
- 31) A. Ray, **D. Ghosh** and A. Roy Chowdhury,  
"Topological study of multiple co-existing attractor in a nonlinear system"  
**Journal of Physics A: Mathematical and Theoretical, 42 (2009) 385102.**

**2008**

- 32) **Dibakar Ghosh,**  
"Nonlinear observer-based synchronization scheme for multiparameter estimation"  
**Europhysics Letters, 84 (2008)40012.**
- 33) **Dibakar Ghosh,** S. Banerjee,  
"Adaptive scheme for synchronization-based multiparameter estimation from a single chaotic time series and its applications"  
**Physical Review E, 78(2008)056211.**
- 34) A. P. Misra, **Dibakar Ghosh** and A. Roy Chowdhury,  
"A novel Hyperchaos in the quantum Zakharov system for plasmas"  
**Physica Letters A, 372(2008)1469-1476.**
- 35) **Dibakar Ghosh,** P. Saha and A. Roy Chowdhury,

"On the study of delay feedback control and adaptive synchronization near sub-critical Hopf bifurcation"  
**International Journal of Modern Physics C,19(1) (2008)169-185.**

- 36) S. Banerjee, **Dibakar Ghosh** and A. Roy Chowdhury,  
"Multiplexing synchronization and its applications in cryptography"  
**Physica Scripta, 78 (2008), 015010 .**
- 37) A. Ray, **Dibakar Ghosh** and A. Roy Chowdhury,  
"On the chaotic aspects of three wave interaction in a magnetized plasma"  
**Physica Letters A, 372(2008)5329-5335.**
- 38) **Dibakar Ghosh**, A. Roy Chowdhury and P. Saha,  
"Bifurcation continuation, chaos and chaos control in nonlinear Bloch system"  
**Communication in Nonlinear Sciences and Numerical Simulation, 13(2008)1461-71.**
- 39) **Dibakar Ghosh**, A. Roy Chowdhury and P. Saha,  
"Multiple delay Rossler System --Bifurcation and chaos control"  
**Chaos, Soliton & Fractals,35 (2008)472-485.**
- 40) **Dibakar Ghosh**, A. Roy Chowdhury and P. Saha,  
"On the various kinds of synchronization in delayed Duffing--Van der Pol system"  
**Communication in Nonlinear Sciences and Numerical Simulation, 13(2008)790-803.**
- 41) **Dibakar Ghosh** and A. Roy Chowdhury,  
"Comparison of Empirical Mode Decomposition and Wavelet Approach for the Analysis of Time Scale Synchronization"  
**Chaos and Complexity Letters, Vol. 3(2)(2008)97-110.**
- 42) **Dibakar Ghosh**, A. Ray and A. Roy Chowdhury,  
"Generalized and phase synchronization between two different time-delayed systems"  
**Modern Physics Letters B, 22(19)(2008)1867-1878.**
- 43) S. Banerjee, **Dibakar Ghosh**, A. Ray and A. Roy Chowdhury,  
"Synchronization Between Two Different Time Delayed Systems and Image Encryption"  
**Europhysics Letters, 81(2008)20006.**

#### 2007

- 44) **Dibakar Ghosh**, S. Banerjee and A. Roy Chowdhury,  
"Synchronization between variable time delayed systems and cryptography"  
**Europhysics Letters, 80(2007)30006.**
- 45) **Dibakar Ghosh** and A. Roy Chowdhury,  
"Various Types of Chaos Synchronization - A Comparative Study of Empirical Mode Decomposition and Wavelet Approach"  
**International Journal of Nonlinear Science,4(1)(2007)52-66.**
- 46) **Dibakar Ghosh** and A. Roy Chowdhury,  
"On the Bifurcation Pattern and Normal Form in a Modified Predator-Prey Nonlinear System"  
**ASME, Journal of Computational and Nonlinear Dynamics,2(2007)267-273.**
- 47) **Dibakar Ghosh**, P. Saha and A. Roy Chowdhury,  
"On synchronization of a forced delay dynamical system via the Galerkin approximation"  
**Communication in Nonlinear Sciences and Numerical Simulation, 12(2007)928-41.**

#### Journal Editorial Board Member

Journal of Nonlinear Dynamics (Hindawi Publishing Corporation, <http://www.hindawi.com/journals/jndy/>)  
Journal of Applied Mathematics (Hindawi Publishing Corporation, <http://www.hindawi.com/journals/jam/>)