CURRICULUM VITAE

Personal Details

Name	**:**	**Koeli Ghoshal**
Position	**:**	Associate Professor Department of Mathematics Indian Institute of Technology (IIT) Kharagpur Kharagpur 721 302 Phone No - -03222 283666 (O) Email: **koeli@maths.iitkgp.ac.in**
Present address	**:**	B-266, IIT Campus, Kharagpur-721 302 Phone No - -03222 283667 (R) Mobile- +91 9830362053
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Educational Qualifications

- Ph. D. done in Applied Mathematics (Fluid Dynamics) from Physics and Applied Mathematics Unit (PAMU), Indian Statistical Institute, Kolkata (Degree awarded by Jadavpur University), 2005.

- M.Sc. done in Applied Mathematics from Burdwan University in 1996 (secured First class)

- B.Sc. (Hons) done in Mathematics under Burdwan University in 1994 (secured First class)

Title of the thesis:

On velocity and suspension concentration in a sediment-laden flow: Experimental and theoretical studies.

Work experiences:

- From 4th April, 2016 working as **Associate Professor** in the Department of Mathematics of IIT, Kharagpur.

- From 19th February 2007 to 3rd April 2016 worked as **Assistant Professor** in the Department of Mathematics of IIT, Kharagpur.

- Worked as a **Research Associate** from September 2006 to 18th February 2007 at Physics and Applied Mathematics Unit (PAMU) of ISI, Kolkata.

- Worked as a **Visiting Scientist** from November 2005 to June 2006 at PAMU of ISI, Kolkata.

- Worked as a **Research Fellow** at Fluvial Mechanics Laboratory, PAMU at Indian Statistical Institute (ISI), Kolkata with Professor B. S. Mazumder from November 1999 to October 2005.

Research Area:

- Turbulent Flow in Open Channel
- Sediment Transport in Ice-covered Channel
- Mechanics of Sediment Transport
- Grain-Size Distribution
- Mathematical Modelling of Fluid Flow
- Secondary Current and Dip Phenomenon
- Parameter Estimation in Sediment Transport
- Semi-Analytical Methods in Sediment Transport and Fluid Flow Problems (Homotopy Analysis Method, Homotopy Perturbation Method etc)

Publications in Journals: (SCI = Science Citation Index, SCIE = SCI Expanded, IF = Impact Factor)

While being Associate Professor (04.04.2016 onwards)

1. Arun Kumar, Sumit Sen, Sourav Hossain and **Koeli Ghoshal** (2023) Unsteady two-dimensional distribution of suspended sediment transport in open channels, ***Environmental Fluid Mechanics***, https://doi.org/10.1007/s10652-023-09933-1, **SCIE and IF: 2.2,** Publisher: **Springer.**

2. Sourav Hossain, Shiv Mohan, **Koeli Ghoshal** and Anirban Dhar (2023) Unsteady numerical simulation of suspended load in relation to grain-size distribution, ***Environmental Earth Sciences***, DOI: https://doi.org/10.1007/s12665-023-10890-7, Vol 82 (9), article No 232, **SCI and IF: 2.8,** Publisher: **Springer.**

3. Sourav Hossain, Sumit Sen, **Koeli Ghoshal** and Anirban Dhar (2023) Combined impact of density stratification and hindered settling on non-equilibrium suspended sediment transport in open channel flows, ***Journal of Hydrologic Engineering***, DOI: 10.1061/JHYEFF/HEENG-5910, Vol 28(8), Article No 04023023, **SCI and IF: 2.439,** Publisher: **ASCE (American Society of Civil Engineers).**

4. Sumit Sen, Snehasis Kundu, Rafik Absi and **Koeli Ghoshal** (2023) A model for coupled fluid velocity and suspended sediment concentration in an unsteady stratified turbulent flow through open channel, ***Journal of Engineering Mechanics,*** DOI: 10.1061/(ASCE)EM.1943-7889.0002158, Vol 149 (1), Article No 04022088, **SCIE and IF: 3.125,** Publisher**: ASCE (American Society of Civil Engineers).**

5. Sumit Sen, Sourav Hossain and **Koeli Ghoshal** (2022) Distribution of non-uniform particles in an open channel flow from the concept of mixing length, ***Sedimentary Geology,*** https://doi.org/10.1016/j.sedgeo.2022.106242, Vol 440, Article No 106242, **SCI and IF: 2.8,** Publisher: **Elsevier.**

6. Punit Jain, Snehasis Kundu, **Koeli Ghoshal** and Rafik Absi (2022) Direct derivation of streamwise velocity from RANS equation in an unsteady non-uniform open channel flow, ***Journal of Engineering Mechanics,*** DOI: 10.1061/(ASCE)EM.1943-7889.0002169, Vol 148 (12), Article No 06022002, **SCIE and IF: 3.125,** Publisher**: ASCE (American Society of Civil Engineers).**

7. Sourav Hossain, Gaurav Singh, Anirban Dhar and **Koeli Ghoshal** (2022) Generalized non-equilibrium suspended sediment transport model with hindered settling effect for open channel flows, ***Journal of Hydrology***, https://doi.org/10.1016/j.jhydrol.2022.128145,Vol 612, Article No 128145, **SCI and IF: 6.4,** Publisher: **Elsevier.**

8. Snehasis Kundu, Sumit Sen, Shiv Mohan and **Koeli Ghoshal** (2022) Two-dimensional distribution of stream-wise mean velocity in turbulent flow with effect of suspended sediment, ***Environmental Fluid Mechanics***, https://doi.org/10.1007/s10652-022-09834-9, Vol 22, pp 133-158, **SCIE and IF: 2.2,** Publisher: **Springer.**

9. Manotosh Kumbhakar, Shiv Mohan, **Koeli Ghoshal**, Jitendra Kumar and Vijay P Singh (2022) Semi-analytical solution for non-equilibrium suspended sediment transport in open channels with concentration-dependent settling velocity, ***Journal of Hydrologic Engineering***, DOI:10.1061(ASCE)HE.1943-5548.0002160, Vol 27(2), Article No 04021048, **SCI and IF: 2.439,** Publisher: **ASCE (American Society of Civil Engineers).**

10. **Koeli Ghoshal**, Punit Jain and Rafik Absi (2022) Non-linear partial differential equation for unsteady vertical distribution of suspended sediments in open channel flows: Effects of hindered settling and concentration-dependent mixing length, ***Journal of Engineering Mechanics,*** DOI: 10.1061/(ASCE)EM.1943-7889.0002045, Vol 148(1), Article No 04021123, **SCIE and IF: 3.125,** Publisher: **ASCE (American Society of Civil Engineers).**

11. Punit Jain, Manotosh Kumbhakar and **Koeli Ghoshal (**2022**)** Application of Homotopy Analysis Method to the determination of vertical concentration distribution with shear-induced diffusivity, ***Engineering with Computers***, https://doi.org/10.1007/s00366-021-01491-8, Vol 38 (Suppl 3), pp S2609-S2628, **SCIE and IF: 8.7**, Publisher: **Springer.**

12. Snehasis Kundu and **Koeli Ghoshal** (2021) Effects of non-locality on unsteady nonequilibrium sediment transport in turbulent flows: A study using space fractional ADE with fractional divergence, ***Applied Mathematical Modelling,*** https://doi.org/10.1016/j.apm.2021.03.023, Vol 96, pp 617-644, **SCIE and IF: 5**, Publisher: **Elsevier**.

13. Shiv Mohan, Snehasis Kundu, **Koeli Ghoshal** and Jitendra Kumar (2021) Numerical study on two dimensional distribution of streamwise velocity in open channel turbulent flows with secondary current effect, ***Archives of Mechanics,*** DOI: 10.24423/aom.3610, Vol 73(2)**,** pp 175-200**, SCIE and IF 1.18,** Publisher: **Polish Academy of Sciences.**

14. Sudip Debnath, **Koeli Ghoshal** and Jitendra Kumar (2021) Unsteady two-dimensional suspended sediment transport in open channel flow subject to deposition and re-entrainment, ***Journal of Engineering Mathematics***, https://doi.org/10.1007/s10665-020-10070-7, Vol 126(1), Article No 6, **SCI and IF 1.3,** Publisher: **Springer.**

15. Manotosh Kumbhakar, Rajendra Kumar Ray, Suvra Kanti Chakraborty, **Koeli Ghoshal** and Vijay P. Singh (2021) Mathematical Modelling of Streamwise Velocity Profile in Open Channels Using Tsallis Entropy, ***Communications in Nonlinear Science and Numerical Simulation***, https://doi.org/10.1016/j.cnsns.2020.105581, Vol 94, 105581, **SCI and IF 3.9**, Publisher: **Elsevier**.

16. Punit Jain and **Koeli Ghoshal** (2021**)** An explicit expression for velocity profile in presence of secondary current and sediment in an open channel turbulent flow, ***Canadian Journal of***

Civil Engineering, https://doi.org/10.1139/cjce-2019-0205, Vol 48 (1), pp 52-61, **SCI and IF: 1.771**, Publisher: **National Research Council of Canada.**

17. Manotosh Kumbhakar, Rajendra K. Ray, **Koeli Ghoshal** and Vijay P. Singh (2020) On the role of Tsallis entropy index for velocity modelling in open channels, ***Physica A: Statistical Mechanics and its Applications,*** 124901, https://doi.org/10.1016/j.physa.2020.124901, **SCI and IF: 3.3,** Publisher: **Elsevier**.

18. Sudip Debnath and **Koeli Ghoshal** (2020) Transport of reactive species in oscillatory Couette-Poiseuille flows subject to homogeneous and heterogeneous reactions, ***Applied Mathematics and Computation***, https://doi.org/10.1016/j.amc.2020.125387, Vol 385, Article No 125387, **SCI and IF 4,** Publisher**: Elsevier.**

19. Shiv Mohan, Manotosh Kumbhakar, **Koeli Ghoshal** and Jitendra Kumar (2020) Semi-analytical solution for one-dimensional unsteady sediment transport model in open channel with concentration-dependent settling velocity, ***Physica Scripta,*** https://doi.org/10.1088/1402-4896/ab6f21, Vol 95(5), Article number 055204, **SCI and IF: 2.9,** Publisher**: IOP (Institute of Physics) Publishing.**

20. Manotosh Kumbhakar, **Koeli Ghoshal** and Vijay P. Singh (2020) Two-dimensional distribution of streamwise velocity in open channel flow using maximum entropy principle: Incorporation of additional constraints based on conservational laws, ***Computer Methods in Applied Mechanics and Engineering,*** https://doi.org/10.1016/j.cma.2019.112738, Vol 361, Article. No 112738**, SCI and IF: 7.2,** Publisher**: Elsevier.**

21. Manotosh Kumbhakar, **Koeli Ghoshal** and Vijay P. Singh (2019) Application of relative entropy theory to streamwise velocity profile in open-channel flow: effect of prior probability distributions, ***Zeitschrift für Angewand Mathematic und Physic ZAMP (Journal of Applied Mathematics and Physics),*** https://doi.org/10.1007/s00033-019-1124-0, Vol 70(3), Article no 80, **SCI and IF: 2.0**, Publisher: **Springer.**

22. Shiv Mohan, Manotosh Kumbhakar, **Koeli Ghoshal** and Jitendra Kumar (2019) Semi-Analytical Solution for Simultaneous Distribution of Fluid Velocity and Sediment Concentration in Open Channel Flow, ***Journal of Engineering Mechanics,*** DOI: 10.1061/(ASCE)EM.1943-7889.0001671, Vol 145(11), Article number 04019090, **SCIE and IF: 3.125,** Publisher**: ASCE (American Society of Civil Engineers).**

23. **Koeli Ghoshal**, Manotosh Kumbhakar and Vijay P. Singh (2019) Distribution of sediment concentration in Debris flow using Renyi entropy, ***Physica A: Statistical Mechanics and its Applications,*** https://doi.org/10.1016/j.physa.2019.01.081,Vol 521, pp 267-281. **SCI and IF: 3.3,** Publisher: **Elsevier**.

24. Snehasis Kundu and **Koeli Ghoshal** (2019), An entropy based model for velocity-dip-position, ***Journal of Environmental Informatics***, Vol 33(2), pp 113-128. **SCIE and IF 10.22**, Publisher: **International Society for Environmental Information Sciences.**

25. Snehasis Kundu, Manotosh Kumbhakar and **Koeli Ghosha**l (2018) Reinvestigation on mixing length in an open channel turbulent flow, ***Acta Geophysica,*** https://doi.org/10.1007/s11600-017-0109-7, Vol 66(1), pp 93-107. **SCIE and IF 2.3,** Publisher: **Springer.**

26. Manotosh Kumbhakar, Snehasis Kundu and **Koeli Ghoshal** (2018), An explicit analytical expression for bed-load layer thickness based on maximum entropy principle, ***Physics Letters A***, https://doi.org/10.1016/j.physleta.2018.05.045, Vol 382 (34), pp 2297- 2304. **SCI and IF**: **2.6**, Publisher: **Elsevier.**

27. Manotosh Kumbhakar, Jitraj Saha, **Koeli Ghoshal**, Jitendra Kumar and Vijay P. Singh (2018), Vertical Sediment Concentration Distribution in High-Concentrated Flows: An Analytical Solution Using Homotopy Analysis Method, ***Communications in Theoretical Physics***, DOI: 10.1088/0253-6102/70/3/367, Vol 70 (3), pp 367-378. **SCI and IF: 2.877,** Publisher: **IOP (Institute of Physics) Publishing.**

28. Koeli Ghoshal, Manotosh Kumbhakar and Vijay P. Singh (2018), Suspended Sediment Concentration and Discharge in Open Channels using Renyi Entropy, ***Journal of Hydrologic Engineering,*** DOI: 10.1061/(ASCE)HE.1943-5584.0001687, Vol 23(9)**,** Article No 04018038**, SCI and IF: 2.439,** Publisher: **ASCE (American Society of Civil Engineers).**

29. Punit Jain, Manotosh Kumbhakar and **Koeli Ghosha**l (2018), A Mathematical Model on Depth-Averaged β-Factor in Open Channel Turbulent Flow, ***Environmental Earth Sciences,*** https://doi.org/10.1007/s12665-018-7428-0, Vol 77, Article No. 253, **SCI and IF: 2.8,** Publisher: **Springer.**

30. Manotosh Kumbhakar, Snehasis Kundu and **Koeli Ghosha**l (2017), Hindered settling velocity in particle-fluid mixture: A theoretical study using entropy concept, ***Journal of Hydraulic Engineering,*** DOI: 10.1061/(ASCE)HY.1943-7900.0001376, Vol 143(11), **SCI and IF: 2.785,** Publisher: **ASCE (American Society of Civil Engineers).**

31. Manotosh Kumbhakar, **Koeli Ghosha**l and Vijay P. Singh (2017), Renyi entropy and random walk hypothesis to study suspended sediment concentration, ***Journal of Hydrologic Engineering,*** DOI: 10.1061/(ASCE) HE.1943-5584.0001546, Vol 22(8), **SCI and IF: 2.439,** Publisher: **ASCE (American Society of Civil Engineers).**

32. Debasish Pal and **Koeli Ghoshal** (2017), Hydrodynamic interaction in suspended sediment distribution of open channel turbulent flow, ***Applied Mathematical Modelling,*** http://dx.doi.org/10.1016/j.apm.2017.02.045, Vol 49, pp 630-646. **SCIE and IF: 5**, Publisher: **Elsevier**.

33. Debasish Pal and **Koeli Ghoshal** (2017), Theoretical modeling of suspended grain-size distribution in fluvial environment by stratification and secondary current approaches, ***Environmental Fluid Mechanics***, DOI: 10.1007/s10652-017-9510-7, Vol 17(3), pp 591-613. **SCIE and IF: 2.2,** Publisher: **Springer.**

34. Snehasis Kundu and **Koeli Ghoshal** (2017), A Mathematical model for type II profile of concentration distribution in turbulent flows, ***Environmental Fluid Mechanics***, Vol 17(3), pp 449-472. **SCIE and IF: 2.2,** Publisher: **Springer.**

35. Manotosh Kumbhakar, **Koeli Ghoshal** and Vijay P. Singh (2017), Derivation of Rouse Equation for sediment concentration using Shannon Entropy, ***Physica A: Statistical Mechanics and its Applications,*** http://dx.doi.org/10.1016/j.physa.2016.08.068, Vol 465, pp 494-499. **SCI and IF: 3.3,** Publisher: **Elsevier**.

36. Manotosh Kumbhakar and **Koeli Ghoshal** (2017), One Dimensional velocity distribution in open channels using Renyi entropy, ***Stochastic Environmental Research and Risk Assessment***, DOI: 10.1007/s00477-016-1221-y, Vol 31(4), pp 949-959. **SCI and IF: 4.2,** Publisher: **Springer**.

37. Debasish Pal and **Koeli Ghoshal** (2016), Effect of particle concentration on sediment and turbulent diffusion coefficients in open channel turbulent flow, ***Environmental Earth Sciences***, DOI 10.1007/s12665-016-6045-z, Vol 75(18), article no 1245. **SCI and IF 2.8**, Publisher: **Springer.**

38. Manotosh Kumbhakar, Snehasis Kundu, **Koeli Ghoshal** and Vijay P. Singh (2016), Entropy-based modeling of velocity lag in sediment-laden open channel turbulent flow, ***Entropy,*** DOI: 10.3390/e18090318, Vol 18(9), article no 318. **SCIE and IF: 2.7,** Publisher: **MDPI.**

While being Assistant Professor (19.02.2007 onwards)

39. Manotosh Kumbhakar and **Koeli Ghoshal** (2016), Two dimensional velocity distribution in open channels using Renyi entropy, ***Physica A: Statistical Mechanics and its Applications,*** Vol 450, pp 546-559**. SCI and IF: 3.3,** Publisher: **Elsevier**.

40. Debasish Pal and **Koeli Ghoshal** (2016), Vertical distribution of fluid velocity and suspended sediment in open channel turbulent flow, ***Fluid Dynamics Research***, Vol 48(3), pp 1-27. **SCIE and IF: 1.5,** Publisher: **Institute of Physics.**

41. Debasish Pal, Sanjeev K. Jha and **Koeli Ghoshal** (2016), Velocity lag between particle and liquid in sediment-laden open channel turbulent flow, ***European Journal of Mechanics B/Fluids,*** Vol 56, pp 130-142. **SCIE and IF: 2.6,** Publisher: **Elsevier**.

42. Debasish Pal and **Koeli Ghoshal** (2015), Grain-size distribution in open channel by mixing length approach *by* ***Environmetrics*** Vol 26(2), pp 107-119. **SCI and IF: 1.7**, Publisher: **Wiley.**

43. Mukulika Brahma, Prasanta Kumar Das and **Koeli Ghoshal** (2015), Unique shapes of liquid bells as a function of flow parameters: A brief overview and some new results *by*. ***European Journal of Mechanics B/Fluids,*** Vol 50, pp 98-109. **SCIE and IF: 2.6,** Publisher: **Elsevier.**

44. Snehasis Kundu and **Koeli Ghoshal** (2014), Effects of secondary current and stratification on suspension concentration in an open channel flow, ***Environmental Fluid Mechanics***, Vol 14(6), pp 1357-1380. **SCIE and IF: 2.2,** Publisher: **Springer.**

45. **Koeli Ghoshal** and Debasish Pal (2014), Grain-size distribution in suspension over a sand-gravel bed in an open channel flow, ***International Journal of Sediment Research***, Vol 29 (2), 2014, pp 184-194. **SCIE and IF: 3.6,** Publisher: **Elsevier.**

46. Debasish Pal and **Koeli Ghoshal** (2014), Effect of bed roughness on grain-size distribution in an open channel flow, ***Journal of Hydro-environment Research***, Vol 8(4), 2014, pp 441-451. **SCIE and IF: 2.8,** Publisher: **Elsevier.**

47. Debasish Pal and **Koeli Ghoshal** (2014), Mathematical model on grain-size distribution in suspension over sand-gravel bed, ***Journal of Hydrology***, Vol 511, 2014, pp 640-647. **SCI and IF: 6.4,** Publisher: **Elsevier.**

48. **Koeli Ghoshal** and Debasish Pal (2014), An analytical model for bedload layer thickness, ***Acta Mechanica***, Vol 225(3), pp 701-714. **SCI and IF: 2.7**, Publisher: **Springer.**

49. Snehasis Kundu and **Koeli Ghoshal** (2014), Explicit formulation for suspended concentration distribution with near-bed particle deficiency, ***Powder Technology***, Vol 253, 2014, pp 429-437. **SCI and IF: 5.2,** Publisher: **Elsevier.**

50. Snehasis Kundu and **Koeli Ghoshal** (2014), Concentration distribution in an open channel flow by observational approach ***ISH Journal of Hydraulic Engineering***, Vol 20(1), pp 75-89. Publisher: **Taylor and Francis**.

51. Debasish Pal and **Koeli Ghoshal** (2013), Hindered settling with an apparent particle diameter concept, ***Advances in Water Resources***, Vol 60, pp 178-187. **SCI and IF: 4.7**, Publisher: **Elsevier**.

52. **Koeli Ghoshal** and Snehasis Kundu (2013), Influence of secondary current on vertical concentration distribution in an open channel flow, ***ISH Journal of Hydraulic Engineering***, Vol 19(2), pp 88-96. Publisher: **Taylor and Francis.**

53. **K. Ghoshal**, Rahul Mazumder, C. Chakraborty and B. S. Mazumder (2013), Turbulence, suspension and downstream fining over a sand-gravel mixture bed, ***International Journal of Sediment Research***, Vol 28(2), 2013, pp 194-209. **SCIE and IF: 3.6,** Publisher: **Elsevier.**

54. Snehasis Kundu and **Koeli Ghoshal** (2013), An explicit model for concentration distribution using biquadratic-log-wake-law in a sediment-laden open channel flow, ***Journal of Applied Fluid Mechanics***, Vol 6(3), 2013, pp 339-350. **SCIE and IF: 1.152**, Publisher: **Regional information center for science and technology.**

55. Snehasis Kundu and **Koeli Ghoshal** (2012), An analytical model for velocity distribution and dip-phenomenon in uniform open channel flows, ***International Journal of Fluid Mechanics Research***, Vol 39(5), 2012, pp 381-395. Publisher: **Begell house.**

56. Snehasis Kundu and **Koeli Ghoshal** (2012), Velocity distribution in open channels: Combination of log-law and parabolic law, ***World Academy of Science, Engineering and Technology***, Vol 68, 2012, pp. 2151-2158. Publisher: Waset.

57. Snehasis Kundu and **Koeli Ghoshal** (2012), Application of beta, gamma and psi functions in sediment transport, ***Mathematical Sciences International Research Journal***, Vol 1(1), 2012, pp 152-168. Publisher: IMRF.

58. K. Ghoshal, B. Purkait and B. S. Mazumder (2011), Size distributions in suspension over sand-pebble mixture: An experimental approach, ***Sedimentary Geology***, Vol 241, pp 3-12. **SCI and IF: 2.8,** Publisher: **Elsevier.**

59. K. Ghoshal, B. S. Mazumder and B. Purkait (2010), Grain-size distributions of bed load: Inferences from flume experiments using heterogeneous sediment beds, ***Sedimentary Geology***, Vol 223, pp 1-14. **SCI and IF: 2.8,** Publisher: **Elsevier.**

60. Bijoy. S. Mazumder, Dibyendu. K. Pal, **Koeli Ghosha**l and Satya P. Ojha (2009), Turbulence statistics of flow over isolated scalene and isosceles triangular-shaped bedforms, ***Journal of Hydraulic Research,*** **IAHR,** Vol 47(5), pp 626-637. **SCI and IF: 2.116,** Publisher: **Taylor and Francis.**

Before joining IIT

61. K. Ghoshal and B. S. Mazumder (2006), Velocity and concentration distribution in sediment-mixed fluid: An approach with mixing length concept, ***ISH Journal of Hydraulic Engineering***, Vol 12(3), 2006, pp 20-28. Publisher: **Taylor and Francis**.

62. B. S. Mazumder, D. K. Pal, **K. Ghoshal** and S. P. Ojha (2006), Contributions of burst-sweep cycles to the Reynolds shear stress over the waveform structures, ***ISH Journal of Hydraulic Engineering,*** Vol 12(2), pp 66-77. Publisher: **Taylor and Francis.**

63. B. S. Mazumder and **K. Ghoshal** (2006), Velocity and concentration profiles in uniform sediment-laden flow, ***Applied Mathematical Modelling,*** Vol. 30(2), pp 164 -176. **SCIE and IF: 5**, Publisher: **Elsevier**.

64. K. Ghoshal and B. S. Mazumder (2005), Sediment-induced stratification in a turbulent open-channel flow, ***Environmetrics,*** Vol. 16 (7)**,** 2005, pp. 673-686. **SCI and IF: 1.7**, Publisher: **Wiley.**

65. B. S. Mazumder, **K. Ghoshal** and D. C. Dalal (2005), Influence of bed roughness on sediment suspension: Experimental and theoretical studies, ***Journal of Hydraulic***

Research, IAHR, Vol 43(3), pp 245-257. **SCI and IF: 2.116,** Publisher: **Taylor and Francis.**

66. B. S. Mazumder and **K. Ghoshal** (2002), Velocity and suspension concentration in sediment-mixed fluid, ***International Journal of Sediment Research***, Vol 17(3), pp 220-232. **SCIE and IF: 3.6,** Publisher: **Elsevier.**

Reviewer

(i) The European Physical Journal E (Publisher: Springer)
(ii) Arabian Journal of Geosciences (Publisher: Springer)
(iii) Applied Mathematical Modelling (Publisher: Elsevier)
(iv) Mathematical problems in Engineering (Publisher: Hindwai)
(v) Earth surface processes and Landforms (Publisher: Wiley)
(vi) Sedimentary Geology (Publisher: Elsevier)
(vii) Environmental Earth Sciences (Publisher: Springer)
(viii) Journal of Applied Fluid Mechanics (Publisher: RICST)
(ix) International Journal of Sediment Research (Publisher: Elsevier)
(x) Journal of Hydrologic Engineering (Publisher: ASCE)
(xi) Journal of Hydraulic Engineering (Publisher: ASCE)
(xii) ISH Journal of Hydraulic Engineering (Publisher: Taylor and Francis)
(xiii) Journal of Hydrology (Publisher: Elsevier)
(xiv) Stochastic Environmental Research and Risk Assessment (Publisher: Springer)
(xv) Reviewed some selected papers for ***River Flow 2018***, *Ninth International Conference on Fluvial Hydraulics*
(xvi) Reviewed some selected papers for ***River Flow 2020***, *Tenth International Conference on Fluvial Hydraulics*

Conferences

- Simultaneous treatment of velocity and concentration in the suspension region of an open channel turbulent flow *by* Sourav Hossain, Sumit Sen, Koeli Ghoshal and Anirban Dhar, **27th International Conference on Hydraulics, Water Resources, Environmental and Coastal Engineering** (HYDRO 2022 INTERNATIONAL) at Punjab Engineering College Chandigarh, India during December 22 -24, 2022.

- Solution of unsteady one-dimensional advection-diffusion equation using fifth kind shifted Chebyshev polynomial *by* Sumit Sen and Koeli Ghoshal, **27th International Conference on Hydraulics, Water Resources, Environmental and Coastal Engineering** (HYDRO 2022 INTERNATIONAL) at Punjab Engineering College Chandigarh, India during December 22 -24, 2022.

- Steady two-dimensional suspended sediment transport in channels with biquadratic log-wake law of velocity and concentration dependent eddy viscosity *by* Arun Kumar, Sourav Hossain and Koeli Ghoshal, **27th International Conference on Hydraulics, Water Resources, Environmental and Coastal Engineering** (HYDRO 2022 INTERNATIONAL) at Punjab Engineering College Chandigarh, India during December 22 -24, 2022.

- Numerical simulation of a simplified stratification model of suspended sediment concentration in an open channel turbulent flow *by* Sourav Hossain, **Koeli Ghoshal** and Anirban Dhar, **ICMASMTP-2022**, **International Conference on Modeling, Analysis and Simulations of Multiscale Transport Phenomenon**, 25-27th August, 2022, Department of Mathematicsby , IIT Kharagpur.

- Effects of hydrodynamic phenomena on two-dimensional distribution of suspended sediment concentration in an open channel flow *by* Sumit Sen, Sourav Hossain and **Koeli Ghoshal, ICMASMTP-2022**, **International Conference on Modeling, Analysis and Simulations of Multiscale Transport Phenomenon**, 25-27th August, 2022, Department of Mathematics, IIT Kharagpur

- Distribution of two-dimensional unsteady sediment concentration in an open channel flow *by* Shiv Mohan, Sudip Debnath, **Koeli Ghoshal** and Jitendra Kumar, **ICACM-2018**, **International Conference on Applied and Computational Mathematics 2018,** 23rd-25th November, 2018, Department of Mathematics, Indian Institute of Technology Kharagpur. Published in: Mathematical Modeling and computational tools (Springer Proceedings in Mathematics and Statistics Vol 320, pp 83-90, 2020).

- Solution to one-dimensional diffusion equation with concentration dependent mixing length *by* Punit Jain and **Koeli Ghoshal**, **ICACM-2018**, **International Conference on Applied and Computational Mathematics 2018,** 23rd-25th November, 2018, Department of Mathematics, Indian Institute of Technology Kharagpur. Published in: Mathematical Modeling and computational tools (Springer Proceedings in Mathematics and Statistics Vol 320, pp 93-99, 2020).

- A Closed-Form Explicit Analytical Solution to the Generalized One-Dimensional Diffusion Equation for Suspended Sediment Transport in Open Channels *by* Manotosh Kumbhakar, Jitraj Saha, **Koeli Ghoshal**, Jitendra Kumar and Vijay P. Singh, **TOPAS-2017, A National Conference on Engineering Mathematics**, 16th-17th December, 2017, Department of Mathematics, Indian Institute of Technology Kharagpur.

- Velocity Profile in a Sediment-Laden Flow through Mixing Length Approach *by* **Koeli Ghoshal** and Manotosh Kumbhakar**, 37th IAHR (International Association for Hydro-Environment Engineering and Research) WORLD CONGRESS,** 13th -18th August, 2017, Kuala Lumpur, Malaysia (In proceedings of the 37th IAHR World Congress, pp 1238-1244, 2017)

- A study on the β-factor in sediment-laden flow through open channels *by* **Koeli Ghoshal** and Manotosh Kumbhakar, Proceedings of International Conference on Hydraulics, Water Resources and Coastal Engineering, **HYDRO-2016**, CWPRS Pune, India, 8th-10th December 2016, **Indian Society for Hydraulics**, 2016, pp 789-793.

- A study on velocity and concentration distribution in an open channel flow *by* **Koeli Ghoshal** and Debasish Pal, **58th congress of ISTAM**, 18th-21st December 2013, **Bengal Engineering and Science University, Shibpur** (presently Indian Institute of Engineering Science and Technology, Shibpur).

- Velocity distribution in open channels: Combination of log-law and parabolic law *by* Snehasis Kundu and **Koeli Ghoshal**, **International Conference held in Paris, France** during August, 2012 organized by World Academy of Science, Engineering and Technology, Vol 68, 2012, pp. 2151-2158.

- Effect of secondary currents on concentration distribution in open channel flows *by* **Koeli Ghoshal** and Snehasis Kundu, In: Proceedings of International Conference on Hydraulics, Water Resources and Ocean Engineering, **HYDRO-2012, IIT Mumbai, Indian Society for Hydraulics,** 2012, pp. 385-394.

- Velocity distribution with dip phenomenon in sediment-laden flow *by* Snehasis Kundu and **Koeli Ghoshal**, In: Proceedings of International Conference on Hydraulics, Water Resources and Ocean Engineering, **HYDRO-2011, SUVNIT Surat, Indian Society for Hydraulics,** 2011, pp 787-794

- Velocity and concentration distributions in a sediment-laden flow using modified mixing length (with B. S. Mazumder), In: Proceedings of International Conference on Hydraulics, Water Resources and Ocean Engineering, **HYDRO-2005, Indian Society for Hydraulics,** 2005, pp. 617-625.

- Turbulent statistics of flow over waveform structures (with B. S. Mazumder, D. K. Pal and S. P. Ojha), In: Proceedings of International Conference on Hydraulics, Water Resources and Ocean Engineering, **HYDRO-2004, Indian Society for Hydraulics,** 2004.

- Turbulence characteristics over artificial waveforms and its implication on sediment transport, (with B. S. Mazumder, D. K. Pal and S. P. Ojha), In: Proceedings of International Conference on Hydraulic Engineering: Research and Practice, 2004, **Indian Institute of Technology, Roorkee**, pp. 204-214.

- Effect of bed roughness on suspended sediments (with B. S. Mazumder and D. C. Dalal), In: **Shallow Flows**, (Jirka & Uijttewaal eds), Balkema Publishers Leiden, The Netherlands, 2004, pp. 503-509.

- Measurements of turbulent flow over an artificial wave form in an open channel by 3-D Acoustic Doppler Velocimeter, (with B. S. Mazumder, K. K. Mondal and D. K. Pal), In: Proceedings of Conference on Hydraulics, Water Resources and Ocean Engineering, **HYDRO-2003, Indian Society for Hydraulics,** 2003, pp. 398-405.

- Stratification effects in a sediment-laden turbulent flow, (with B. S. Mazumder), In: Proceedings of Conference on Hydraulics, Water Resources and Ocean Engineering, **HYDRO-2003, Indian Society for Hydraulics,** 2003, pp. 161-165.

Member of professional bodies

- Life member: Indian Society for Hydraulics (ISH FM no 632)
- Life member: Indian Mathematical Society (Life membership number is L/2019/157)

Professional recognition/awards/ fellowships received:

i. Nominated in 2022 for the INSA Teachers Award of the Indian National Science Academy.

ii. Fellow of Indian Society for Hydraulics (Awarded **ISH Fellowship** Certificate by The Indian Society for Hydraulics in June, 2019, ISH FM no 632).

iii. Selected among **Teachers Receiving Top Teaching Feedback Responses** in the Academic session 2018-2019 (Spring) at IIT, KGP for teaching **Maths-II** for 1st year undergraduate students.

iv. Selected for the award (5th Venus International Faculty Awards VIFA 2019) of **Distinguished Faculty in Science (**Major area of study – Mathematics**)** by Venus International Foundation, Chennai.

v. Selected among **Teachers Receiving Top Teaching Feedback Responses** in the Academic session 2018-2019 (Autumn) at IIT, KGP for teaching **Transform Calculus** for 2nd year undergraduate students.

vi. Selected among **Teachers Receiving Top Teaching Feedback Responses** in the Academic session 2017-2018 (Autumn) at IIT, KGP for teaching **Partial Differential Equations** for 2nd year undergraduate students.

vii. Selected among **Teachers Receiving Top Teaching Feedback Responses** in the Academic session 2016-2017 (Spring) at IIT, KGP for teaching **Maths-II** for 1st year undergraduate students.

viii. Received the award (Venus International Women Awards VIWA 2017) of **Distinguished Women in Science** by Venus International Foundation, Chennai.

ix. Selected among **Teachers Receiving Top Teaching Feedback Responses** in the Academic session 2016-2017 (Autumn) at IIT, KGP for teaching **Linear Algebra** for 2nd year undergraduate students.

x. Selected among **Teachers Receiving Top Teaching Feedback Responses** in the Academic session 2015-2016 at IIT, KGP for teaching **Maths-II** for 1st year undergraduate students.

xi. Selected among **Teachers Receiving Top Teaching Feedback Responses** in the Academic session 2014-2015 at IIT, KGP for teaching **Maths-II** for 1st year undergraduate students.

xii. Selected for the award of **Young Scientist fellowship** in the SERC FAST TRACK Proposal of Department of Science and Technology (DST), New Delhi.

xiii. Received **G. M. Nawathe award** for best paper in the conference in HYDRO-2002, Indian Society for Hydraulics, Pune.

xiv. Fellowship received from Department of Science and Technology (DST), New Delhi and Council of Scientific and Industrial Research (CSIR), New Delhi as Research Fellow.

xv. National Scholarship holder.

Students' Awards/Recognition

- Dr. Debasish Pal received **Prof. U. C. Kothyari Best Ph.D. Thesis Award 2016** from the **Indian Society for Hydraulics**.

- Dr. Snehasis Kundu received **Young Scientist Award** in December 2016 from **Venus International Foundation**, Chennai and have been selected as `Outstanding Scientist in Mathematics' from 5th Venus International Research Awards - VIRA 2019 under the Science Discipline.

Project completed as Principal Investigator

****Title:** Flow perturbation and sediment suspension over sandy bedforms: Theoretical and experimental studies.
Duration: 1st January, 2008 – 31st December, 2010

Sponsored Agency: MHRD, DST.

****Title**: Theoretical investigation on turbulent features and concentration distribution in an open channel flow. (*Sanctioned in October 2016, fund releasing letter came on 12th January, 2017*) Letter number and date: EMR/2015/002434 Dt. 01.12.2016

Sponsored Agency: SERB, DST
Date of commencement: 27.12.2016
Co-Principal Investigator: Dr. Jitendra Kumar (Dept. of Mathematics, IIT KGP)

Advisor: Prof. Subhasis Dey (Dept. of Civil Engineering, IIT KGP)

Total Grant: Rs. 20,71,080/-
Duration: Three years (Completed in March 2020)

Project completed as Co-Principal Investigator

Title: From discrete particle to population balance modelling: The micro-macro transitions.

Sponsored Agency: SERB, DST
Date of commencement: 01.10.2018
Principal Investigator: Dr. Jitendra Kumar (Dept. of Mathematics, IIT KGP)

Total Grant: Rs. 22,83,160/-
Duration: Three years (Completed in March 2022)

Teaching at IIT Kharagpur

1. MA10001 Maths 1 (2009, 2010)
2. MA10002 Maths 2 (2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 (Co-Coordinator), 2019 (Coordinator)
3. MA11004 Linear Algebra, Numerical and Complex Analysis (2021)
4. MA20101 Transform Calculus (2007, 2008, 2011, 2018, 2020)
5. MA20202 Transform Calculus (2023 (Coordinator))
6. MA20103 Partial Differential Equations (2009, 2012, 2013, 2015, 2017, 2019)
7. MA20203 Theory of Partial Differential Equations (2021, 2022)
8. MA 20102 Numerical solution of ordinary and partial differential equations (2008, 2009)
9. MA 20103 Linear Algebra (2013, 2016)
10. MA 40002/MA51004 Integral equation and variational methods (2008, 2009, 2010)
11. MA 40011/MA 51003 Fluid Mechanics (2008)
12. MA 41005 Advanced Numerical Technique (2010)
13. MA 51005 Analytical Mechanics (2015, 2016, 2017, 2018)
14. Preparatory Mathematics (2010, 2011)
15. MA31007 Mathematical Methods (2019, 2020, 2021)

Ph.D. Guidance (completed)

- **Dr. Shiv Mohan** (Joint guidance, with Prof. J. Kumar, Dept. of Mathematics) joined in June, 2017 and submitted his thesis on 13th December, 2021. Thesis title: **Mathematical Modelling of Turbulent flow and Sediment Transport Process Through an Open Channel.** His defense was held on 7th April, 2022.

- **Dr. Punit Jain** (Single Guidance) joined in June, 2016 and submitted his thesis on 8th July, 2021. Thesis title: **Mathematical Modelling of Turbulent Flow in Open Channel: Semi-analytical and Numerical Studies.** His defense was held on 17th November, 2021.

- **Dr. Manotosh Kumbhakar** (Single Guidance) joined in June, 2014 and submitted thesis on 14th February, 2019. Thesis title: **Application of Maximum Entropy Principle to Open Channel Turbulent Flow**. His defense was held on 10th May, 2019. (*upto December 2019 worked as Research Associate at IIT, Mandi. From January 2020-December 2021 worked as Research Associate at Texax A & M University College Station, USA*).

- **Dr. Debasish Pal** (Single guidance) joined in July, 2011 and submitted his thesis on 9th October, 2015. Thesis title: **Mathematical Modeling on Non-Cohesive Sediment Transport in Open Channel Turbulent Flow**. His defense was held on 29th March, 2016. (Worked upto 2019 as *Postdoctoral Research Fellow at Engineering Systems and Design Pillar, Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372*).

- **Dr. Mukulika Brahma** (Joint guidance) joined in July, 2007 and submitted her thesis on 6th July, 2015. Thesis title: **Formation, Shape Evolution and Disintegration of some Unique Liquid Bells.** Her defense was held on 9th February, 2016.

- **Dr. Snehasis Kundu** (Single guidance) joined in July, 2010 and submitted his thesis on 23rd July, 2014. Thesis title: **Theoretical Study on Velocity and Suspension Concentration in Turbulent Flow**. His defense was held on 20th January, 2015. (Currently working as *Assistant Professor at NIT, Jamsedpur*).

Ph.D. Guidance (ongoing)

- **Mr. Sourav Hossain** (Joint guidance, with Prof. Anirban Dhar, Dept. of Civil Engineering) submitted his thesis on 17th July, 2023.

- **Mr. Sumit Sen** (Single guidance) is pursuing for Ph. D. (completed four years).

- **Mr. Arun Kumar** (Single guidance) is pursuing for Ph. D.

- **Mr. Sweta Narayan Sahu** (Single guidance) (completed two years)

- **Mr. Bhabotosh Kanungo** (Single guidance) (joined in July, 2023)

Institute/Departmental Activities

- PGPEC (Post Graduate Program Evaluation Committee) Departmental representative from 2023
- Member of the departmental faculty recruitment committee (for selection of Assistant and Associate Professor) from 2023
- Department committee member for selection of Post Doctoral Fellow from 2023
- Department committee member for the construction of syllabus for ITEP (B.Sc.-B.Ed.) curriculum offered by School of Education
- Worked (2018-2021) as Faculty Advisor of 5 year Integrated M.Sc. (Maths and Computing)
- Conducted **AICTE-QIP sponsored short term course** in the Department of Mathematics from February 25- March 1, 2019 on Fourier Series, Transform Technique and their Applications as Coordinator (Jointly with Dr. J. Kumar of Dept. of Mathematics)
- Conducted **International Conference on Applied and Computational Mathematics 2018 (ICACM-2018)** organized by Department of Mathematics, IIT KGP from November 23-25, 2018 as Co-Convener.
- Worked as Member of Research co-ordination group, Departmental Academic committee, Purchase committee, Computer committee etc.
- Worked as Assistant Warden (Mess) in RLB Hall for two years (from 1st October, 2011 to 31st October, 2013).
- Worked as In-charge of Maths Colloquium for two years (2010-2012)
- Worked as member of time table committee in the department for two years (from 1st July, 2009 to 30th July, 2011)
- Worked as examiner in JAM-2007 and scrutinizer in JAM-2008
- Worked as Faculty Advisor for 5 year Integrated M.Sc. (Maths and Computing) for five years (from July 2007 to May 2012).

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