CURRICULUM VITAE

Personal Details

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

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

- M.Sc. done in Applied Mathematics from Burdwan University, Session 1994-1996 (final exam in 1997) (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 (joined November, 1999, submitted June, 2004; defense in July, 2005).** Supervisor: Prof. B. S. Mazumder (retired), Physics and Applied Mathematics Unit (PAMU), Indian Statistical Institute, Kolkata.

Work experiences:

- From 23rd October, 2025 working as **Professor** in the Department of Mathematics of IIT, Kharagpur.
- From 4th April, 2016 to 22nd October, 2025 worked 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 an ice-covered channel
- Mechanics of sediment transport
- Grain-size distribution is suspension
- 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

Publications in Journals: (SCI = Science Citation Index, SCIE = SCI Expanded, IF = Impact Factor (based on the data of 2022/2023 except the recent ones)

After being Professor (23.10.2025 onwards)

1. Sandipan Paul, Bhabatosh Kanungo, Sweta Narayan Sahu and **Koeli Ghoshal** (2026) Dispersion of solute from an elevated continuous point source in turbulent flow through an ice-covered channel, ***Applied Mathematical Modelling***, https://doi.org/10.1016/j.apm.2025.116512, Vol 151, Article No 116512. **SCIE and IF: 5.1**, Publisher: **Elsevier**.

2. Sourav Hossain, Asok Das, Sanjib Naskar, Sweta Narayan Sahu and **Koeli Ghoshal** (2025), Suspended sediment transport in ice-covered turbulent flow: Semi-analytical solution and parametric sensitivity, ***International Journal for Numerical and Analytical Methods in Geomechanics,*** https://doi.org/10.1002/nag.70192, **SCIE and IF**: **3.6**, Publisher: **Wiley**.

3. Sweta Narayan Sahu, Chirodeep Bakli and **Koeli Ghoshal** (2025) Unsteady two-dimensional concentration distribution in an ice-covered channel with temperature dependent settling velocity, ***Physics of Fluids***, https://doi.org/10.1063/5.0300606, Vol 37(11), Article No 115116, **SCIE and IF 4.1,** Publisher: **AIP.**

While being Associate Professor (04.04.2016 onwards)

4. Sweta Narayan Sahu and **Koeli Ghoshal** (2026) Simultaneous study of sediment concentration and fluid velocity in an ice-covered channel, ***Cold Regions Science and Technology***, https://doi.org/10.1016/j.coldregions.2025.104655, Vol 241, Article No 104655, **SCIE and IF 3.8**, Publisher: **Elsevier.**

5. Arun Kumar and **Koeli Ghoshal** (2026) Distribution of suspended sediment in open channel turbulent flow through space-time fractional ADE, ***Communications in Nonlinear Science and Numerical Simulation***, https://doi.org/10.1016/j.cnsns.2025.109254**,** Vol 152, Article number 109254**, SCI and IF 3.8**, Publisher: **Elsevier**.

6. Sweta Narayan Sahu, Sourav Hossain, Carlo Gualtieri and **Koeli Ghoshal** (2025) Analytical and Numerical investigation of suspended sediment concretion profiles in an ice-covered channel using the time-fractional advection-diffusion equation, ***Journal of Engineering Mechanics***, DOI: 10.1061/JENMDT.EMENG-8452, Vol 151(9)**,** Article No 04025045**, SCIE and IF: 3.2,** Publisher**: ASCE (American Society of Civil Engineers).**

7. Arun Kumar, Sweta Narayan Sahu and **Koeli Ghoshal** (2025) Semi-analytical solution of unsteady one-dimensional sediment transport model through time fractional ADE, ***Zeitschrift für Angewandta Mathematik und Physik ZAMP (Journal of Applied Mathematics and***

Physics), https://doi.org/10.1007/s00033-025-02424-x, Vol 76, Article No 44, **SCI and IF: 1.934**, Publisher: **Springer.**

8. Arun Kumar, Sumit Sen, Snehasis Kundu and **Koeli Ghoshal** (2025) Grain-size distribution in suspension through open channel turbulent flow with space-fractional ADE, ***Physica A: Statistical Mechanics and its Applications,*** https://doi.org/10.1016/j.physa.2024.130223, Vol 657**,** Article No 130223**, SCI and IF: 3.1,** Publisher: **Elsevier**.

9. Sumit Sen, **Koeli Ghoshal** and Jaan H. Pu (2025) Study of steady two-dimensional advection-diffusion equation with stratification using second-kind shifted Chebyshev polynomials, ***Engineering with Computers***, https://doi.org/10.1007/s00366-024-02086-9, Vol 41, pp 2179-2199, **SCIE and IF: 7.3**, Publisher: **Springer.**

10. Sweta Narayan Sahu, Sumit Sen, Sourav Hossain, and **Koeli Ghoshal** (2024) Unsteady suspended sediment distribution in an ice-covered channel through fractional advection-diffusion equation, ***Journal of Engineering Mathematics***, https://doi.org/10.1007/s10665-024-10380-0, Vol 147, Article No 7, **SCI and IF 1.3,** Publisher: **Springer.**

11. Sweta Narayan Sahu, Sourav Hossain, Sumit Sen and **Koeli Ghoshal** (2024) Sediment transport in ice-covered channel under non-equilibrium condition, ***Environmental Earth Sciences***, https://doi.org/10.1007/s12665-024-11642-x**,** Vol 83, Article No 315**, SCI and IF: 2.8,** Publisher: **Springer.**

12. Arun Kumar, Sourav Hossain, Sumit Sen, Shiv Mohan, and **Koeli Ghoshal** (2024) Grain-size distribution in suspension under non-equilibrium condition, ***International Journal of Sediment Research,*** https://doi.org/10.1016/j.ijsrc.2024.06.003, Vol 39**,** pp 774-794**, SCIE and IF: 3.6,** Publisher: **Elsevier.**

13. Arun Kumar, Sumit Sen, Sourav Hossain and **Koeli Ghoshal** (2024) Unsteady two-dimensional distribution of suspended sediment transport in open channels, ***Environmental Fluid Mechanics***, https://doi.org/10.1007/s10652-023-09933-1, Vol 24(4), pp 651-674, **SCIE and IF: 2.2,** Publisher: **Springer.**

14. 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.**

15. 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).**

16. 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).**

17. 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.**

18. 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).**

19. 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.**

20. 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.**

21. 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).**

22. 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).**

23. 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.**

24. 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**.

25. 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.**

26. 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.**

27. 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**.

28. 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.**

29. 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,*** https://doi.org/10.1016/j.physa.2020.124901, Vol 557, Article No 124901, **SCI and IF: 3.3,** Publisher: **Elsevier**.

30. 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.**

31. 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.**

32. 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.**

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34. 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).**

35. 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**.

36. Snehasis Kundu and **Koeli Ghoshal** (2019), An entropy based model for velocity-dip-position, ***Journal of Environmental Informatics***, doi:10.3808/jei.201600344, Vol 33(2), pp 113-128. **SCIE and IF 10.22**, Publisher: **International Society for Environmental Information Sciences.**

37. 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.**

38. 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.**

39. 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.**

40. 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).**

41. 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.**

42. 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).**

43. 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).**

44. 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**.

45. 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.**

46. Snehasis Kundu and **Koeli Ghoshal** (2017), A Mathematical model for type II profile of concentration distribution in turbulent flows, ***Environmental Fluid Mechanics***, DOI 10.1007/s10652-016-9498-4, Vol 17(3), pp 449-472. **SCIE and IF: 2.2,** Publisher: **Springer.**

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48. 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**.

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50. 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)

51. Manotosh Kumbhakar and **Koeli Ghoshal** (2016), Two dimensional velocity distribution in open channels using Renyi entropy, ***Physica A: Statistical Mechanics and its Applications*****,** DOI:10.1016/j.physa.2016.01.046, Vol 450(4), pp 546-559**. SCI and IF: 3.3,** Publisher: **Elsevier**.

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66. 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.**

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Before joining IIT

73. **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**.

74. 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.**

75. 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**.

76. **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.**

77. 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.**

78. 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) Scientific reports (Publisher: Nature Portfolio)
(ii) Physics of Fluid (Publisher: AIP)
(iii) The European Physical Journal E (Publisher: Springer)
(iv) Arabian Journal of Geosciences (Publisher: Springer)
(v) Applied Mathematical Modelling (Publisher: Elsevier)
(vi) Mathematical problems in Engineering (Publisher: Hindwai)
(vii) Earth surface processes and Landforms (Publisher: Wiley)
(viii) Sedimentary Geology (Publisher: Elsevier)
(ix) Environmental Earth Sciences (Publisher: Springer)
(x) Journal of Applied Fluid Mechanics (Publisher: RICST)
(xi) International Journal of Sediment Research (Publisher: Elsevier)
(xii) Journal of Hydrologic Engineering (Publisher: ASCE)
(xiii) Journal of Hydraulic Engineering (Publisher: ASCE)
(xiv) ISH Journal of Hydraulic Engineering (Publisher: Taylor and Francis)
(xv) Journal of Hydrology (Publisher: Elsevier)
(xvi) Stochastic Environmental Research and Risk Assessment (Publisher: Springer)
(xvii) Reviewed some selected papers for ***River Flow 2018***, *Ninth International Conference on Fluvial Hydraulics*
(xviii) Reviewed some selected papers for ***River Flow 2020***, *Tenth International Conference on Fluvial Hydraulics*
(xix) Acta Geophysica (Publisher: Springer)
(xx) Advances in Water Resources (Publisher: Elsevier)
(xxi) Iranian Journal of Science and Technology (Publisher: Springer)

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, Indian Society for Hydraulics) 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, Indian Society for Hydraulics) 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, Indian Society for Hydraulics) 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 (2025) *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 Mathematics by, IIT Kharagpur. Springer Proceedings in Mathematics & Statistics, vol 491, pp 243-252. Springer, Singapore. https://doi.org/10.1007/978-981-96-3098-1_18

- 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. Springer Proceedings in Mathematics & Statistics, vol 491, pp 253-272. Springer, Singapore. https://doi.org/10.1007/978-981-96-3098-1_19.

- 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, 8^{th}-10^{th} 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, **58^{th} congress of ISTAM**, 18^{th}-21^{st} 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.

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), 2024 (Coordinator))
6. MA20103 Partial Differential Equations (2009, 2012, 2013, 2015, 2017(Coordinator), 2019)
7. MA20203 Theory of Partial Differential Equations (2021, 2022)
8. MA 20102/ MA20201 Numerical solution of ordinary and partial differential equations (2008 (Coordinator), 2009, 2024)
9. MA 20103 Linear Algebra (2013, 2016)
10. MA 40002/MA51004 Integral equation and variational methods (2008, 2009, 2010)
11. MA 40011/MA51003 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)
16. MA60275 Advanced Fluid Dynamics (2023)
17. MA11006 Ordinary Differential Equations (2025)
18. MA21205 Numerical Analysis (2025)
19. MA20204/MA30208 Applied Computational Methods (2026 ongoing)
20. MA49204 Numerical Analysis Lab (2026 ongoing)

Ph.D. Guidance (completed)

- **Sweta Narayan Sahu** (Single guidance) joined in August, 2021 and submitted his thesis on 24th February, 2026. Thesis title: **Modelling sediment transport problems under turbulent flow in an ice-covered channel.** His defense was held on 16th April, 2026.

- **Arun Kumar** (Single guidance) joined the institute in July, 2019; joined with me in January, 2022 and submitted his thesis on 3rd March, 2025. Thesis title: **Numerical and**

semi-analytical solutions of time-dependent sediment transport problems. His defense was held on 18th June, 2025.

- **Sumit Sen (**Single guidance) joined in July, 2019 and submitted his thesis on 10th May, 2024. Thesis title: **Theoretical study on non-equilibrium sediment transport in open channel flow**. His defense was held on 21st August, 2024.

- **Sourav Hossain** (Joint guidance, with Prof. Anirban Dhar, Dept. of Civil Engineering) joined in June, 2018 and submitted his thesis on 17th July, 2023. Thesis title: **Numerical solution of sediment transport problems under non-equilibrium condition.** His defense was held on 17th October, 2023.

- **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.

- **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.

- **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.

- **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. Received **Prof. U. C. Kothyari best Ph.D. thesis award 2016** from the **Indian Society for Hydraulics**.

- **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.

- **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. Bhabatosh Kanungo (Single guidance) (joined in July 2023)
- Mr. Sandipan Paul (Single guidance) (joined in July 2024)
- Ms. Sayani Bar (Single guidance) (joined in July 2025)
- Ms. Priyasha Das (Single guidance) (joined in December 2025)

Institute/Departmental Activities

- Currently working as Faculty Advisor for 2 year M.Sc. (starting from July 2025)
- PGPEC (Post Graduate Program Evaluation Committee) Departmental representative in 2023
- Member of the departmental faculty recruitment committee
- Department committee member for selection of Post Doctoral Fellow
- Department committee member for the construction of syllabus for ITEP (B.Sc.-B.Ed.) curriculum offered by Department of Education (2022-2024) and also member of faculty recruitment committee.
- Worked (2018-2021) as Faculty Advisor of 5year 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 (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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