Dr. Somnath Bhattacharyya, FNASc

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Education:

Ph.D.	Indian Institute of Science, Bangalore	1990	Computational Fluid Dynamics
M.Sc.	Calcutta University	1986	Applied Mathematics
B.Sc.(Hons.)	Calcutta University	1984	Mathematics (Hons.)

Professional Positions Held:

Organisation	Post held	Period
I.I.T. Kharagpur	Professor, HAG Scale	1.09.2010- Present
I.I.T. Kharagpur	Professor	09.08.2004- 1.09.2010
I.I.T. Kharagpur	Associate Professor	14.08.2000- 08.08.2004
I.I.T. Kharagpur	Assistant Professor	1.09.1995-13.08.2000
I.I.T. Kharagpur	Senior Lecturer	1.02.1993-31.08.1995
ADE, Defence R & D Organization, Bangalore.	Scientist	15.07.1990-31.01.1993

Visiting Positions:

1. Visiting Scientist at **The Center for CFD, University of Leeds, UK** during March, 1998 to February, 1999.
2. Visiting Assistant Professor at the **Department of Mathematics, University College London, UK** during May, 2000 to July, 2000.
3. Visiting Scientist at the **Department of Mechanical Engineering, The Ohio State University, USA** from December, 2001 to December, 2002 under the projects sponsored by NASA and DARPA.
4. Visiting Scientist at the **Department of Mechanical Engineering, The Ohio State University, USA** from May, 2003 to August, 2003 under a project sponsored by DARPA.
5. Visiting fellow at the **Max Planck Institute for Marine Microbiology, Bremen, Germany** from May to August, 2004 under the Max Planck Society grant.
6. Visiting Professor at the **Max Planck Institute for Marine Microbiology, Bremen, Germany** from June, 2006 to June, 2007.
7. Visiting Professor at the **Center for Smart Interfaces, TU-Darmstadt, Germany** from May to July, 2010 and 2011, June-July, 2014; and **Karlsruhe Institute of Technology, Germany** in June, 2014; **University of Stuttgart, Germany** during June-July, 2017 and 2022; **Karlsruhe Institute of Technology, Germany & TU-Kaiserslautern** in June-July, 2019; Univ. Stuttgart in June-July, 2022.

Professional Recognitions, Fellowships received:

1. Elected Fellow (FNASc), National Academy of Sciences, India.
2. Institute Chair Professor.
3. BOYSCAST Fellow 1997, DST, India for advanced research training for 12 months at the Center for CFD, **University of Leeds, UK** during 1998-99.
4. Engineering and Physical Sciences Research Council (EPSRC), UK Visiting Professor Grants at **University College London, UK** during April to July, 2000.
5. Max Planck Fellowship at the **MPI for Marine Microbiology, Bremen, Germany** in 2004 and 2006.
6. DFG, Germany Fellowship in 2006 to collaborate at the **MPI, Bremen**.
7. Hanse-Wissenschaftskollege (HWK), Germany Fellowship for August-November, 2006.
8. Max Planck Society research grant to collaborate with **MPI, Bremen, Germany** from December, 2006 to June, 2007.

List of Sponsored Projects implemented in recent years:

Grant agency	Title of the project	Duration (mm/yy- mm/ yy)
SERB, DST	**Electrokinetic transport phenomena involving liquid droplets and hydrophobic surfaces: a numerical and theoretical analysis**	01.2023 - 01.2026
SEB, DST (MATRICS)	**Modified mathematical model for micro-scale transport of ionic fluids incorporating short range interactions pertaining to Microfluidics**	02.2022 - 02.2025
CSIR	**Numerical and Theoretical Analysis of Micro-Particles Self-Propulsion in Electrolyte or Gel Medium**	01.2021 - 01.2024
SERB, DST	**Electro-osmotic flow, interfacial patterns and instabilities in micro/nano-channels with indentations**	01.2017 - 01.2020
DST	**Numerical Study on Electro-Hydrdynamics of Immiscible or Miscible Fluids with Conductivity Gradient**	05.13 - 05.16
CSIR	**Modelling Electrokinetic Flows in Microfluidics**	05.12 - 05.15
DST	**Electro-osmotic Flow and Mixing in charged Micro and Nano-Channels: A Computational and Analytical Study**	11.08 - 05.12
CSIR	**Wall Proximity on Bluff-BodyWake: 3-D Aspects**	12.06 - 12.09
DST	**Vortex Body Interaction and Unsteady Flow Separation using Particle Simulation Approach**	04.03 - 04.06
CSIR	**Vortex Shedding and Heat Transfer from Bluff Body with Ground Effect**	05.03 - 05.06
CSIR	**Numerical Simulation of Separated Flows at Large Reynolds Numbers**	03.1999 - 03. 02

PhD Guidance: **Nineteen students** completed PhD and received degree from IIT Kharagpur under my guidance. Currently six PhD students are working under my supervision.

Postdoc Guidance: Mentor for Five Post-docs sponsored by NBHM, CSIR and DST projects.

Contribution to Continuing Education Program:

1. Video courses developed for NPTEL on-line Program:
   (a) Modeling Transport Phenomena of Microparticles in 2017.
   (b) Mathematical Methods for Boundary Value Problems in 2019 and 2022.
   (c) Advanced Computational Techniques in 2023.
2. Delivered lectures in the GIAN funded courses:
   (a) Electrokinetics in porous media, jointly organized by IIT Roorkee in November, 2017 .
   (b) Electrokinetics of Complex Soft (Bio) Colloids: from Fundamentals to Applications in Biophysics and Environmental Physical-Chemistry, Organized by NIT Patna in April, 2018.
3. List of AICTE and TEQIP sponsored short term courses Organized at IIT Kharagpur in recent years:
   (a) AICTE sponsored course: Recent Advances in Computational Sciences with Application , during November 22-27, 2010.
   (b) AICTE sponsored Course: Scientific Computing and Applications to Industrial Problems, during November 19-23, 2018.
   (c) TECQIP-III Workshop: Mathematical Tools for Boundary Value Problems and Applications, during March 9-13, 2020.
   (d) One day Symposium: Computational Data Science and its Applications, Feb 17, 2020.

List of Publications:

1. S. Majhi and S. Bhattacharyya: A simplified model for the impact of dielectric polarization of a charged droplet on its diffusiophoresis. **Physics of Fluids** 35, 032018 (2023). doi:https://doi.org/10.1063/5.0142875
2. B. Bhaskar and S. Bhattacharyya: Numerical study supplemented with simplified model on electrophoresis of a hydrophobic colloid incorporating finite ion size effects and ion-solvent interactions. **Electrophoresis** 44 (2023), 403-416. doi:https://doi.org/10.1002/elps.202200232
3. S. Majhi and S. Bhattacharyya: Diffusiophoresis of a charged droplet in asymmetric as well as mixed electrolytes through numerical and semi-analytic models. **Langmuir** (2023, accepted).
4. A. D. Ratschow, D. Pandey, B. Liebchen, S. Bhattacharyya, and S. Hardt : Resonant Nanopumps: ac Gate Voltages in Conical Nanopores Induce Directed Electrolyte Flow. **Physical Review Letters** 129 (2022), 264501. doi:https://doi.org/10.1103/PhysRevLett.129.264501 (highlighted with a Synopsis in Physics Magazine https://physics.aps.org/articles/v15/s174).
5. D. Pandey and S. Bhattacharyya: Effects of membrane polarization, steric repulsion and ion-solvent interactions on electroosmosis through a conical nanopore. **Applied Mathematical Modelling** 111 (2022) 471-485. doi:https://doi.org/10.1016/j.apm.2022.06.038
6. D. Kundu, S. Bhattacharyya and P.P. Gopmandal: Ion partitioning and ion size effects on streaming field and energy conversion efficiency in a soft nanochannel. **Colloid and Polymer Science** 300 (2022), 1049-1062. doi:https://doi.org/10.1007/s00396-022-05007-8
7. S. Bhattacharyya and D. Kundu: Enhanced electroosmotic flow, conductance and ion selectivity of a viscoplastic fluid in a hydrophobic cylindrical pore. **Applied Mathematical Modelling** 111 (2022) 802-817. doi:https://doi.org/10.1016/j.apm.2022.07.012

8. S. Dutta, S. Bhattacharyya and I. Pop: Effect of hybrid nanoparticles on conjugate mixed convection of a viscoplastic fluid in a ventilated enclosure with wall mounted heated block. **Alexandria Engineering Journal** 62 (2022), 99-111. doi:https://doi.org/10.1016/j.aej.2022.06.042

9. S. Majhi and S. Bhattacharyya: Numerical Study on Diffusiophoresis of a Hydrophobic Nanoparticle in a Monovalent or Multivalent electrolyte. **Colloids and Surfaces A: Physicochemical and Engineering Aspects** 648 (2022) 129272. doi:https://doi.org/10.1016/j.colsurfa.2022.129272

10. S. S. Barman and S. Bhattacharyya: Finite ion size and ion permittivity effects on gel electrophoresis of a soft particle. **Colloids and Surfaces A: Physicochemical and Engineering Aspects** 636 (2022) 128088. doi: https://www.sciencedirect.com/science/article/pii/S0927775721019579

11. S. Dutta, S. Bhattacharyya & I. Pop : Heat transfer enhancement compared to entropy generation by imposing magnetic field and hybrid nanoparticles in mixed convection of a Bingham plastic fluid in a ventilated enclosure. **Int. J. Numer Methods Heat & Fluid Flow** (in press) doi:https://doi.org/10.1108/HFF-09-2021-0623

12. A. Haque, A. Nayak and S. Bhattacharyya: Numerical Study on Ion Transport and Electro-Convective Mixing of Power-law Fluid in a Heterogeneous Micro-Constrained Channel. **Physics of Fluids** 33, (2021) 122014. doi: https://aip.scitation.org/doi/full/10.1063/5.0074297

13. S. S. Barman and S. Bhattacharyya: Finite ion size and ion permittivity effects on gel electrophoresis of a soft particle. **Colloids and Surfaces A: Physicochemical and Engineering Aspects** 636 (2022) 128088. doi:https://www.sciencedirect.com/science/article/pii/S0927775721019579

14. D. Pandey and S. Bhattacharyya: Influence of finite ion size and dielectric decrement on the ion current rectification in a single conical nanopore. **Physics of Fluids** 33, (2021) 062006. doi:https://doi.org/10.1063/5.0053080

15. D. Pandey and S. Bhattacharyya: Impact of surface hydrophobicity and ion steric effects on the electroosmotic flow and ion selectivity of a conical nanopore. **Applied Mathematical Modelling** 94, (2021) 721-736. doi:https://doi.org/10.1016/j.apm.2021.01.035

16. P. S. Majee and S. Bhattacharyya: Impact of ion partitioning and double layer polarization on diffusiophoresis of a pH-regulated nanogel. **Meccanica** (2021) 56:1989-2004. doi:https://doi.org/10.1007/s11012-021-01346-y.

17. Bharti, P. P. Gopmandal, S. Bhattacharyya & H. Ohshima: A simplified model for gel electrophoresis of a hydrophobic rigid colloid. **Soft Matter** 17, (2021) 5700-5710. doi:https://pubs.rsc.org/en/content/articlehtml/2021/sm/d1sm00462j

18. D. Pandey, S. Bhattacharyya & S. Ghosal: Charge selectivity of an ionic transistor. **Langmuir** 37, 15, (2021) 4571-4577. doi:https://doi.org/10.1021/acs.langmuir.1c00177.

19. S. Dutta, S. Bhattacharyya & I. Pop: Two-phase model for mixed convection and flow enhancement of a nanofluid in an inclined channel patterned with heated slip stripes. **Int. J. Numer Methods Heat & Fluid Flow** 31 (2021) 3047-3070. doi:https://www.emerald.com/insight/content/doi/10.1108/HFF-11-2020-0718/full/html

20. S. Barman, S, Bhattacharyya & P. Dutta: Electrokinetic actuation of an uncharged polarizable dielectric droplet in charged hydrogel medium. **Electrophoresis** (2021), 42, 920-931. doi:https://doi.org/10.1002/elps.202000343

21. D. Pandey and S. Bhattacharyya: Impact of finite ion size, Born energy difference and dielectric decrement on the electroosmosis of multivalent ionic mixtures in a nanotube. **Colloids and Surfaces A: Phys. & Eng. Aspects** 610 (2021) 125905. doi:https://doi.org/10.1016/j.colsurfa.2020.125905

22. P. P. Gopmandal, S. De, S. Bhattacharyya & H. Ohshima: Impact of ion steric and ion partitioning effects on electrophoresis of soft particles. **Physical Review E** 102.3 (2020) 032601. doi:https://doi.org/10.1103/PhysRevE.102.032601

23. D. Kundu, S. Bhattacharyya, P. P. Gopmandal and H. Ohshima: Settling of a charged hydrophobic rigid colloid in aqueous media under generalized gravitational field. **Electrophoresis** 42 (2021), 1010-1020 doi: https://doi.org/10.1002/elps.202000240

24. S. S. Barman, S. Bhattacharyya, P. P. Gopmandal & H. Ohshima: Impact of charged polarizable core on mobility of a soft particle embedded in a hydrogel medium. **Colloid and Polymer Science** (2020) 298:1729-1739. doi: https://link.springer.com/article/10.1007/s00396-020-04751-z

25. S. Dutta, S. Bhattacharyya & I. Pop: Nonhomogeneous model for conjugate mixed convection of nanofluid and entropy generation in an enclosure in presence of inclined magnetic field with Joule heating. **Int. J. Numer Methods Heat & Fluid Flow**31 (2021) 418-441.
doi: https://doi.org/10.1108/HFF-03-2020-0166

26. D. Kundu & S. Bhattacharyya : Influence of slip velocity at the core of a diffuse soft particle and ion partition effects on mobility. **European Physical Journal E**, 43.5 (2020): 27-27.
doi: https://doi.org/10.1140/epje/i2020-11957-8

27. S.S. Barman & S. Bhattacharyya : Electrokinetic transport of a non-conducting liquid droplet in a polyelectrolyte medium. **Physics of Fluids** 32 (2020) 012011. doi: https:// doi.org/10.1063/1.5134878

28. Bharti, P. P. Gopmandal, S. Bhattacharyya & H. Ohshima : Analytic expression for electrophoretic mobility of soft particles with hydrophobic inner core at different electrostatic conditions.
Langmuir (ACS) 36 (2020) 3201-3211. doi: https:// doi.org/10.1021/acs.langmuir.9b03896

29. D. Pandey, S. Bhattacharyya & S. Ghosal : A numerical study of the selectivity of an isolated cylindrical or conical nanopore to a charged macro-ion. **Biomicrofluidics** 13 (2019) 054108.
doi: https://doi.org/10.1063/1.5124132

30. S. Dutta, S. Bhattacharyya & I. Pop: Non-homogeneous model for the mixed convection of a nanofluid in a lid-driven inclined enclosure with discrete heat source. **ASME J. Heat Transfer** 142 (2020) 012505. doi: https://doi.org/10.1115/1.4045070

31. U. K. Ghoshal, S. Bhattacharyya & A. J. Chamkha : Transport of a heated hydrophobic spherical particle through porous medium. **J. Porous Media**. 20, 383-394.
doi:https://doi.org/10.1615/JPorMedia.2020021179.

32. S. Bhattacharyya & N. Bag: Enhanced electroosmotic flow of Herschel-Bulkley fluid in a channel patterned with periodically arranged slipping surfaces. **Physics of Fluids** 31 (2019) 072007.
doi:https://doi.org/10.1063/1.5098508

33. S. Bhattacharyya & N. Bag : Enhanced electroosmotic flow and ion selectivity in a channel patterned with periodically arranged polyelectrolyte-filled grooves. **Microfluidics Nanofluidics** (2019) 23:46.
doi:https://doi.org/10.1007/s10404-019-2213-2

34. P. S. Majee, S. Bhattacharyya & P. Dutta : On electrophoresis of a pH-regulated nanogel with ion partitioning effects. **Electrophoresis** 40 (2019) 699-709. doi:https://doi.org/10.1002/elps.201800291

35. S. K. Pal, S. Bhattacharyya & I. Pop: A numerical study on non-homogeneous model for the conjugate-mixed convection of a Cu-water nanofluid in a thick wavy wall enclosure. **Appl. Math. Comput.** 356 (2019) 219-234. doi:https://doi.org/10.1016/j.amc.2019.03.008

36. S. K. Pal, S. Bhattacharyya & I. Pop: Impact of nanoparticles migration on mixed convection and entropy generation of a Al_2O_3-water nanofluid inside an inclined enclosure with wavy side wall. **J. Thermal Analysis Calorimetry** 138 (2019) 3205–3221.
doi:https://doi.org/10.1007/s10973-019-08345-y

37. S. K. Maurya, P. P. Gopmandal, S. Bhattacharyya & H. Ohshima : Ion partitioning effect on the electrophoresis of a soft particle with hydrophobic core. **Physical Review E** 98 (2018) 0231203.
doi:https://doi.org/10.1103/PhysRevE.98.023103

38. S. Bhattacharyya & P.S. Majee : Nonlinear electrophoresis of a charged polarizable liquid droplet. **Physics of Fluids** 30 (8) (2018) 082008. doi:https://doi.org/10.1063/1.5039819

39. N. Bag & S. Bhattacharyya : Electroosmotic flow of a non-Newtonian fluid in a microchannel with heterogeneous surface potential. **J. Non-Newtonian Fluid Mechanics** 259 (2018) 48-60. doi:https://10.1016/j.jnnfm.2018.05.005

40. S. K. Pal, S. Bhattacharyya & I. Pop : Effect of solid-to-fluid conductivity ratio on mixed convection and entropy generation of a nanofluid in a lid-driven enclosure with a thick wavy wall. **Int J Heat Mass Transfer**, 127 (2018) 885-900. doi:https://doi.org/10.1016/j.ijheatmasstransfer.2018.06.078

41. S. K. Pal & S. Bhattacharyya: Enhanced heat transfer of Cu-Water nanofluid in a channel with wall mounted blunt ribs. **J. Enhanced Heat Transfer** 25 (2018)61-78. doi:https://10.1615/JEnhHeatTransf.2018019982

42. R.K. Nayak, S. Bhattacharyya & I. Pop : Effects of nanoparticles dispersion on the mixed convection of a nanofluid in a skewed enclosure. **Int. J. Heat Mass Transfer** 125 (2018)908-919. doi:https://10.1016/j.ijheatmasstransfer.2018.04.088

43. P.S. Majee & S. Bhattacharyya : Electroosmotic flow around a dielectric uncharged particle by considering the dielectric decrement effects. **Colloids Surf. A: Physicochem. Eng. Aspects** 547 (2018) 37 -48. doi:https://doi.org/10.1016/j.colsurfa.2018.03.037

44. P.S. Majee, S Bhattacharyya, P.P Goapmandal & H. Oshima: On gel electrophoresis of dielectric charged particles with hydrophobic surface: A combined theoretical and numerical study. **Electrophoresis** 39 (2018) 794 -806. doi:https://10.1002/elps.201700294

45. N. Bag, S. Bhattacharyya, P. P. Gopmandal & H. Ohshima: Electroosmotic flow reversal and ion selectivity in a soft nanochannel. **Colloid Polymer Sci.** 296 (2018) 849-859. doi:https://10.1007/s00396-018-4293-z

46. S. Bhattacharyya & S. Pal: Enhanced electroosmotic flow in a nano-channel patterned with curved hydrophobic strips. **Appl. Math. Model.** 54 (2018) 567-579. https://doi.org/10.1016/j.apm.2017.10.013

47. U.K Ghosal, S. Bhattacharyya, P.P Goapmandal & S. De:Nonlinear Effects on Electrophoresis of a Soft Particle and Sustained Solute Release. **Transport in Porous Media** 121 (2018)121-133. doi:https://10.1007/s11242-017-0952-7.

48. S. Bera & S. Bhattacharyya : Effects of geometric modulation and surface potential heterogeneity on electrokinetic flow and solute transport in a microchannel. **Theo. Compu. Fluid Dyn** 32 (2018) 201-2014. doi:https://10.1007/s00162-017-0448-7

49. P.P. Gopmandal, S. Bhattacharyya & H. Ohshima : Effect of hydrophobic core on the electrophoresis of a diffuse soft particle. **Proc. Royal Society A** 473 (2017), 20160942. doi:https://doi.org/10.1098/rspa.2016.0942

50. S. Bhattacharyya & P.S. Majee : Electrophoresis of a polarizable charged colloid with hydrophobic surface: A numerical study. **Physical Review E** 95 (2017), 042605. doi:https://10.1103/PhysRevE.95.042605

51. S. Bhattacharyya & N. Bag: Enhanced electroosmotic flow through a nanochannel patterned with transverse periodic grooves. **ASME J. Fluids Engineering** 139 (2017) 081203. doi:https://10.1115/1.4036265.

52. P.P Goapmandal, S. Bhattacharyya & H. Oshima: On the similarity between the electrophoresis of a liquid drop and a spherical hydrophobic particle. **Colloid Polymer Sci**. 295(2017) 2077-2082. doi:https://10.1007/s00396-017-4181-y

53. S. Bera & S. Bhattacharyya : Effect of Charge Density on Electrokinetic Ions and Fluid Flow Through Polyelectrolyte Coated Nanopore. **ASME Paper No. FEDSM 2017-69194 (2017)**. doi:https://10.1115/FEDSM2017-69194

54. U.K Ghosal, S. Bhattacharyya, P.P Goapmandal: A Numerical Study on Hydrodynamics of a Soft Particle with Hydrophobic Core. **Recent Patents on Mechanical Engineering** 10 (4)(2017). doi:https://10.2174/2212797610666171103102530.

55. S. Bhattacharyya & Simanta De: Nonlinear effects on electrophoresis of a charged dielectric nanoparticle in a charged hydrogel medium. **Physics of Fluids**. 28 (2016) 092006. doi:https://10.1063/1.4962737

56. P.P. Gopmandal, S. Bhattacharyya, M. Banerjeec, H. Ohshima: Electrophoresis of diffuse soft particles with dielectric charged rigidcore grafted with charge regulated inhomogeneous polymer segments. **Colloids and Surfaces A: Physicochem. Eng. Aspects** 504 (2016) 116-125. doi:https://10.1016/j.colsurfa.2016.05.021

57. R. K. Nayak, S. Bhattacharyya & I. Pop : Heat transfer and entropy generation in mixed convection of a nanofluid within an inclined skewed cavity. **Int. J. Heat Mass Transfer** 102 (2016) 596-609. doi:https://10.1016/j.ijheatmasstransfer.2016.06.049

58. P.P. Gopmandal, S. Bhattacharyya, M. Banerjee & H. Ohshima : Electrophoresis of soft particles with charged rigid core coated with pH regulated polyelectrolyte layer. **Colloid Polymer Sci.** 294 (2016) 1845-1856. doi:https://10.1007/s00396-016-3948-x

59. S. De, S. Bhattacharyya & Partha P. Gopmandal : Importance of core electrostatic properties on the electrophoresis of a soft particle. **Phys. Rev. E** 94, 022611 (2016). doi:https://10.1103/PhysRevE.94.022611

60. S. Bhattacharyyaa & Simanta De : Influence of rigid core permittivity and double layer polarization on the electrophoresis of a soft particle: a numerical study. **Physics of Fluids** 28, 012001 (2016). doi:https://10.1063/1.4938117

61. R. K. Nayak, S. Bhattacharyya & I. Pop : Numerical Study on Mixed Convection and Entropy Generation of a Nanofluid in a Lid-Driven Square Enclosure. **ASME, J. Heat Transfer** 138 (2016) 012503. doi:https://10.1115/1.4031178

62. S. Bhattacharyya & Simanta De : Gel electrophoresis and size selectivity of charged colloidal particles in a charged hydrogel medium. **Chem. Eng. Sci.** 141 (2016) 304-314. doi:https://10.1016/j.ces.2015.11.012

63. P. P. Gopmandal, S. Bhattacharyya & H. Ohshima : Effect of core charge density on the electrophoresis of a soft particle coated with polyelectrolyte layer. **Colloid Polym. Sci.** 294 (2016) 727-733. doi:https://10.1007/s00396-015-3824-0

64. S. Bhattacharyya & S. De : Numerical study of the influence of solid polarization on electrophoresis at finite Debye thickness. **Phys. Rev. E** 92 (2015) 032309. doi:https://10.1103/PhysRevE.92.032309

65. S. De, S. Bhattacharyya & S. Hardt : Electroosmotic flow in a slit nanochannel with superhydrophobic walls. **Microfluidics Nanofluidics** 19 (2015) 1465-1476. doi:https://10.1007/s10404-015-1660-7

66. S. Bera & S. Bhattacharyya : Electroosmotic flow in the vicinity of a conducting obstacle mounted on the surface of a wide microchannel. **Int. J. Eng. Sci.** 94 (2015) 128-138. https://10.1016/j.ijengsci.2015.04.005

67. S. Bhattacharyya & S. Bera : Combined electroosmosis-pressure driven flow and mixing in a microchannel with surface heterogeneity. **Appl. Math. Model.** 39 (2015) 4337-4350. doi:https://10.1016/j.apm.2014.12.050

68. P. P. Gopmandal & S. Bhattacharyya : Effects of convection on isotachophoresis of electrolytes. **ASME J. Fluids Eng.** 137 (2015) 081202. doi:https://10.1115/1.4029888

69. R. K. Nayak, S. Bhattacharyya & I. Pop : Numerical study on mixed convection and entropy generation of Cu-water nanofluid in a diffferentially heated skewed enclosure. **Int. J. Heat Mass Transfer.** 85 (2015) 620-634. doi:https://10.1016/j.ijheatmasstransfer.2015.01.116

70. S. Bhattacharyya & S. De : Numerical study on hydrodynamics of a soft particle and sustained solute release. **Acta Mechanica** 226 (2015) 611-624. doi:https://10.1007/s00707-014-1217-y

71. B. Barman & S. Bhattacharyya : Effect of Dual Splitter Plate Attached with a Square Cylinder Immersed in a Uniform Flow. **Applied Mathematics** 146 (2015) 161-170. doi:https://10.1007/978-81-322-2547-8_14

72. B. Barman & S. Bhattacharyya : Control of vortex shedding and drag reduction through dual splitter plates attached to a square cylinder. **J. Marine Sci.** 14 (2015) 138-145. doi:https://10.1007/s11804-015-1299-5

73. P. P. Gopmandal, S. Bhattacharyya & B. Barman : Effect of induced electric field on migration of a charged porous particle. **European Physical Journal E** 37 (2014) 104. doi:https://10.1140/epje/i2014-14104-4

74. S. Bhattacharyya, S. De & P. P. Gopmandal : Electrophoresis of a colloidal particle embedded in electrolyte saturated porous media. **Chem. Eng. Sci.** 118 (2014) 184-191. doi:https://10.1016/j.ces.2014.07.044

75. P. P. Gopmandal & S. Bhattacharyya : Nonlinear effects on electrokinetics of a highly charged porous sphere. **Colloid Polymer Sci.** 292 (2014) 905-914. doi:https://10.1007/s00396-013-3130-7

76. P. P. Gopmandal & S. Bhattacharyya : Numerical Study on Isotachophoretic Separation of Ionic Samples in Microfluidics. **Modelling and Simulation of Diffusive Processes** Chapter 5 (2014) 97-117. doi:https://10.1007/978-3-319-05657-9_5

77. P. P. Gopmandal & S. Bhattacharyya : Electrokinetics of a charged permeable porous aggregate in an aqueous medium. **Colloids Surf. A: Physicochem. Eng. Aspects** 433 (2013) 64-76. doi:https://10.1016/j.colsurfa.2013.04.056

78. S. Bhattacharyya & P. P. Gopmandal : Effects of electroosmosis and counterion penetration on electrophoresis of a positively charged spherical permeable particle. **Soft Matter** 9 (2013), 1871-1884. doi:https://10.1039/C2SM27590B

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