

## Dr. Kirti Chandra Sahu

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### EDUCATION

- PhD in Fluid Mechanics, JNCASR, Bengaluru, India (2003 - 2007)
- MS in Fluid Mechanics, JNCASR, Bengaluru, India (2001 - 2003)
- BE in Mechanical Engineering, UCE Burla, Odisha, India (1997 - 2001)

### EMPLOYMENT HISTORY

- Professor, Chemical Engineering, IIT Hyderabad, India (April 2018 - Present)
- HoD Chemical Engineering, IIT Hyderabad (October 2014 - October 2017)
- Associate Professor, Chemical Engineering, IIT Hyderabad (December 2013 - April 2018)
- Assistant Professor, Chemical Engineering, IIT Hyderabad (May 2010 - December 2013)
- Visiting Assistant Professor, IIT Hyderabad, India (October 2009 - May 2010)
- Research Associate, Imperial College London, UK (October 2006 - September 2009)

### RESEARCH INTERESTS

- Clouds and raindrops
- Multiphase and interfacial fluid mechanics
- Linear stability theory and pattern formation
- Micro- and bio-fluid mechanics
- Electrohydrodynamics

### RECOGNITIONS

- Elected Fellow of Institute of Physics, UK (2021)
- STAIR Outstanding Researcher Award (2021); Amongst Researchers from 24 Countries.
- Research Excellence Award - IIT Hyderabad (2021)
- Member of External Affairs Committee - American Physical Society DFD (2019 - 2021)
- Visiting Professor, Ritsumeikan University, Japan (December, 2015)
- Indian National Science Academy (INSA) - Medal for Young Scientist (2013)
- National Academy of Sciences India (NASI) - Young Scientist Platinum Jubilee Award (2012)
- Indian Academy of Sciences (IAS) - Young Associate Award (2012 - 2015)
- Recognised by International Union of Theoretical and Applied Mechanics (IUTAM) to organise a symposium on "Multiphase Flows with Phase Change" at IIT Hyderabad (2015)
- IUSSTF (Indo-US Science and Technology Forum) Research Fellow 2011
- DST Young Scientist Award 2011

### EDITORIAL BOARD

- Editorial Board Member, Journal of Engineering Mathematics (2018 - Present)
- Editorial Board Member, Fluid Dynamics and Materials Processing (2020 - Present)
- Editor, IUTAM Procedia, Vol. 15, Pages 1-320 (2015)

### PUBLICATIONS

#### Summary

- Patent: 1 (IN20150351514)
- Books/Monographs: 3
- Journal Publications: 106
- Refereed Conference Publications: 17
- [Google Scholar](#): Total citations: ~2500, H-index: 26, i10-index: 63
- [Scopus \(ID: 23390090300\)](#): Total citations ~2000, H-index: 24, i10-index: 54

## Patent Filed

1. Lal, S., Deepa, M., Janardhanan, V. M., and Sahu, K. C. Direct Paper Based Fuel Cells For Micro Nano System. Indian Patent (IN20150351514).

## Books/Monographs

2. Biswas, G., and Sahu, K. C. (2021). Recent Advances in Free Surface Flows. Mechanical Sciences, 121-144. In: Dixit U., Dwivedy S. (eds) *Mechanical Sciences*, 2021, Publisher: Springer, Singapore. ([https://doi.org/10.1007/978-981-15-5712-5\\_6](https://doi.org/10.1007/978-981-15-5712-5_6)).
3. Sahu, K. C. (edt.) (2015). Multiphase Flows with Phase Change: Challenges and Opportunities. *IUTAM Procedia*, 15, 1 - 320, Publisher: Elsevier. (<https://www.sciencedirect.com/journal/procedia-iutam/vol/15>).
4. Sahu, K. C., and Govindarajan, R. (2012). Double-diffusive instability at high Schmidt number. *Special issue (Karnataka State Higher Education Council) for Prof. CNR Rao's 78<sup>th</sup> Birthday*.

## Journal Papers (Published/Accepted)

### 2021

5. Kainikkara, M. A., Pillai, D. S., Sahu, K. C. (2021). Equivalence of sessile droplet dynamics under periodic and steady electric fields. **npj Microgravity - Nature** (Accepted).
6. Sahu, K. C. (2021). Two-layer channel flow involving a fluid with time-dependent viscosity. **Environmental Fluid Mechanics** (DOI: 10.1007/s10652-021-09803-8).  
\*Invited Paper in the Special Issue "Hydrodynamic and Fluvial Instabilities".
7. Jain, H., Ghosh, S., and Sahu, K. C. (2021). Compression controlled dynamic buckling in thin soft sheets. **Physical Review E**, 104, L033001.
8. Katre, P., Banerjee, S., Balusamy, S., and Sahu, K. C. (2021). Fluid dynamics of respiratory droplets in the context of COVID-19: airborne and surfaceborne transmissions. **Physics of Fluids**, 33 (8), 081302.
9. Pillai, D. S., Sahu, K. C., and Narayanan, R. (2021). Electrowetting of a leaky dielectric droplet under a time-periodic electric field. **Physical Review Fluids**, 6 (7), 073701.
10. Katre, P., Balusamy, S., Banerjee, S., Chandrala, L. D., and Sahu, K. C. (2021). Evaporation dynamics of a sessile droplet of binary mixture laden with nanoparticles. **Langmuir**, 37 (20), 6311-6321.
11. Sahu, K. C. (2021). A new linearly unstable mode in the core-annular flow of two immiscible fluids. **Journal of Fluid Mechanics**, 866, 918, A11.
12. Xu, Z. L., Chen, J. Y., Liu, H. R., Sahu, K. C., and Ding, H. (2021). Motion of self-rewetting drop on a substrate with a constant temperature gradient. **Journal of Fluid Mechanics**, 915, A116.
13. Agrawal, M., Gaurav, A., Karri, B., and Sahu, K. C. (2021). An experimental study of two identical air bubbles rising side-by-side in water. **Physics of Fluids**, 33 (3), 032106.
14. Balusamy, S., Banerjee, S., and Sahu, K. C. (2021). Lifetime of sessile saliva droplets in the context of SARS-CoV-2. **International Communications in Heat and Mass Transfer**, 123, 105178.
15. Balla, M., Tripathi, M. K., Matar, O. K., and Sahu, K. C. (2021). Interaction of two non-coalescing bubbles rising in a non-isothermal self-rewetting fluid. **European Journal of Mechanics - B/Fluids**, 87, 103-112.
16. Chaitanya, G. S., Sahu, K. C., and Biswas, G. (2021). A study of two unequal-sized droplets undergoing oblique collision. **Physics of Fluids**, 33 (2), 022110.
17. Gurralla, P., Balusamy, S., Banerjee, S., and Sahu, K. C. (2021). A review on the evaporation dynamics of sessile drops of binary mixtures: challenges and opportunities. **Fluid Dynamics and Materials Processing**, 17 (2), 253-284 (Invited Paper).
18. Gorthi, S. R., Mondal, P. K., Biswas, G., and Sahu, K. C. (2021). Electro-capillary filling in a microchannel under the influence of magnetic and electric fields. **Canadian Journal of Chemical Engineering**, 99 (3), 725-741.
19. Zhang, J., Sahu, K. C., and Ni, M. J. (2021). Transition of bubble motion from spiralling to zigzagging: A wake-controlled mechanism with a transverse magnetic field. **International Journal of Multiphase Flow**, 136, 103551.
20. Liu, H., Lu, Y., Li, S., Yu, Y., and Sahu, K. C. (2021). Deformation and breakup of a compound droplet in three-dimensional oscillatory shear flow. **International Journal of Multiphase Flow**, 134, 103472.

### 2020

21. Agrawal, M., Katiyar, R. K., Karri, B., and Sahu, K. C. (2020). Experimental investigation of a nonspherical water droplet falling in air. **Physics of Fluids**, 32 (11), 112105.  
\*This article has been selected as the Editor's Pick, which can be identified with an icon 'EP' next to the article title.

22. Kumar, G., Narayana, P. A. L., and Sahu, K. C. (2020). Linear and nonlinear thermosolutal instabilities in an inclined porous layer. **Proceedings of the Royal Society A**, 476, 20190705.
23. Gautam, K., Narayana, P. A. L., and Sahu, K. C. (2020). Linear instability driven by an electric field in two-layer channel flow of Newtonian and Herschel–Bulkley fluids. **Journal of Non-Newtonian Fluid Mechanics**, 285, 104400.
24. Sahu, K. C., Tripathi, M. K., Chaudhari, J., and Chakraborty, S. (2020). Simulations of a weakly conducting droplet under the influence of an alternating electric field. **Electrophoresis**, 41 (23), 1953-1960.
25. Sahu, K. C. (2020). Linear instability in two-layer channel flow due to double-diffusive phenomenon. **Physics of Fluids**, 32 (2), 024102.
26. Katre, P., Gurralla, P., Balusamy, S., Banerjee, S., and Sahu, K. C. (2020). Evaporation of sessile ethanol-water droplets on a critically inclined heated surface. **International Journal of Multiphase Flow**, 131, 103368.
27. Kumar, M., Bhardwaj, R., and Sahu, K. C. (2020). Wetting dynamics of a water droplet on micropillar surfaces with radially varying pitches. **Langmuir**, 36 (19), 5312 - 5323.
28. Kirar, P. K., Alvarenga, K., Kolhe, P., Biswas, G., and Sahu, K. C. (2020). Coalescence of drops on the free-surface of a liquid pool at elevated temperatures. **Physics of Fluids**, 32 (5), 052103.
29. Balla, M., Tripathi, M. K., and Sahu, K. C. (2020). A numerical study of a hollow water droplet falling in air. **Theoretical and Computational Fluid Dynamics**, 34, 133-144.
30. Kannan, Y. S., Balusamy, S., Karri, B., and Sahu, K. C. (2020). Effect of viscosity on the volumetric oscillations of a non-equilibrium bubble in free-field and near a free-surface. **Experimental Thermal and Fluid Science**, 116, 110113.
31. Kanungo, D. K., Shrivastava, S. K., Singh, N. K., and Sahu, K. C. (2020). Heat transfer in supercritical steam flowing through spiral tubes. **ASME Journal of Heat Transfer**, 142 (11), 111901.
32. Kanungo, D. K., and Sahu, K. C. (2020). Numerical simulation of steam flow inside the superheater section of an industrial boiler using a real gas model. **ASME Journal of Fluids Engineering**, 142 (7), 071201.
33. Murugan, R., Kolhe, P. S., and Sahu, K. C. (2020). A combined experimental and computational study of flow-blurring atomization in a twin-fluid atomizer. **European Journal of Mechanics - B/Fluids**, 84, 528-541.
34. Kumar, M., Bhardwaj, R., and Sahu, K. C. (2020). Coalescence dynamics of a droplet on a sessile droplet. **Physics of Fluids**, 32 (1), 012104.
35. Soni, S. K., Kirar, P. K., Kolhe, P., and Sahu, K. C. (2020). Deformation and breakup of droplets in an oblique continuous air stream. **International Journal of Multiphase Flow**, 122, 103141.
36. Balla, M., Kavuri, S., Tripathi, M. K., Sahu, K. C., and Govindarajan, R. (2020). Effect of viscosity and density ratios on two drops rising side by side. **Physical Review Fluids**, 5 (1), 013601.

## 2019

37. Deka, H., Biswas, G., Sahu, K. C., Kulkarni, Y., and Dalal, A. (2019). Coalescence dynamics of a compound drop on a deep liquid pool. **Journal of Fluid Mechanics**, 866, R2: 1 - 11.
38. Balla, M., Tripathi, M. K., Sahu, K. C., Karapetsas, G., and Matar, O. K. (2019). Non-isothermal bubble rise dynamics in a self-rewetting fluid: three-dimensional effects. **Journal of Fluid Mechanics**, 858, 689-713.
39. Sahu, K. C. (2019). Linear instability in a miscible core-annular flow of a Newtonian and a Bingham fluid. **Journal of Non-Newtonian Fluid Mechanics**, 264, 159-169.
40. Gurralla, P., Katre, P., Balusamy, S., Banerjee, S., and Sahu, K. C. (2019). Evaporation of ethanol-water sessile droplet of different compositions at an elevated substrate temperature. **International Journal of Heat and Mass Transfer**, 145, 118770.
41. Kumar, M., Bhardwaj, R., and Sahu, K. C. (2019). Motion of a droplet on an anisotropic microgrooved surface. **Langmuir**, 35 (8), 2957-2965.
42. Usha, R., and Sahu, K. C. (2019). Interfacial instability in pressure-driven core-annular pipe flow of a Newtonian and a Herschel–Bulkley fluid. **Journal of Non-Newtonian Fluid Mechanics**, 271, 104144.
43. Balla, M., Tripathi, M. K., and Sahu, K. C. (2019). Shape oscillations of a nonspherical water droplet. **Physical Review E**, 99, 023107.
44. Chattopadhyay, G., Sahu, K. C., and Usha, R. (2019). Spatio-temporal instability of two superposed fluids in a channel with boundary slip. **International Journal of Multiphase Flow**, 113, 264-278.
45. Borthakur, M. P., Biswas, G., Bandyopadhyay, D., and Sahu, K. C. (2019). Dynamics of an arched liquid jet under the influence of gravity. **European Journal of Mechanics - B/Fluids**, 74, 1-9.
46. Lal, S., Deepa, M., Sahu, K. C., and Janardhanan, V. M. (2019). Methanol-based fuel cell on paper support with N-doped graphene oxide/nickel cobaltite composite catalyst. **Journal of Electrochemical Society**, 166, F190-F197.

## 2018

47. Tripathi, M. K., and Sahu, K. C. (2018). Motion of an air bubble under the action of thermocapillary and buoyancy forces. **Computers and Fluids**, 177, 58-68.
48. Nath, B., Biswas, G., Dalal, A., and Sahu, K. C. (2018). Cross-stream migration of drops suspended in Poiseuille flow in the presence of an electric field. **Physical Review E**, 97, 063106.
49. Kannan, Y. S., Karri, B., and Sahu, K. C. (2018). Entrapment and interaction of an air bubble with an oscillating cavitation bubble. **Physics of Fluids**, 30 (4), 041701.
50. Wang, S., Zhang, Y., Meredith, J. C., Behrens, S. H., Tripathi, M. K., and Sahu, K. C. (2018). The dynamics of rising oil-coated bubbles: experiments and simulations. **Soft Matters**, 14, 2724-2734.
51. Chandra, S., Lal, S., Janardhanan, V. M., Sahu, K. C., and Deepa, M. (2018). Ethanol based fuel cell on paper support. **Journal of Power Sources**, 396, 725-733.

## 2017

52. Sharaf, D. M., Premlata, A. R., Tripathi, M. K., Karri, B., and Sahu, K. C. (2017). Shapes and paths of an air bubble rising in quiescent liquids. **Physics of Fluids**, 29 (12), 122104.
53. Chattopadhyay, G., Usha, R., and Sahu, K. C. (2017). Core-annular miscible two-fluid flow in a slippery pipe: A stability analysis. **Physics of Fluids**, 29 (9), 097106.
54. Tripathi, M. K., Premlata, A. R., Sahu, K. C., and Govindarajan, R. (2017). Two initially spherical bubbles rising in quiescent liquid. **Physical Review Fluids**, 2 (7), 073601.
55. Premlata, A. R., Tripathi, M. K., Karri, B., and Sahu, K. C. (2017). Numerical and experimental investigations of an air bubble rising in a Carreau-Yasuda shear-thinning liquid. **Physics of Fluids**, 29 (3), 033103.
56. Agrawal, M., Premlata, A. R., Tripathi, M. K., Karri, B., and Sahu, K. C. (2017). Nonspherical liquid droplet falling in air. **Physical Review E**, 95, 033111.
57. Nath, B., Biswas, G., Dalal, A., and Sahu, K. C. (2017). Migration of a droplet in a cylindrical tube in the creeping flow regime. **Physical Review E**, 95, 033110.
58. Srivastava, H., Dalal, A., Sahu, K. C., and Biswas, G. (2017). Temporal linear stability analysis of an entry flow in a channel with viscous heating. **International Journal of Heat and Mass Transfer**, 109, 922-929.
59. Premlata, A. R., Tripathi, M. K., Karri, B., and Sahu, K. C. (2017). Dynamics of an air bubble rising in a non-Newtonian liquid in the axisymmetric regime. **Journal of Non-Newtonian Fluid Mechanics**, 239, 53-61.
60. Sahu, K. C. (2017). A review on rising bubble dynamics in viscosity-stratified fluids. **Sadhana**, 42 (4), 575-583 (Invited Paper).
61. Lal, S., Deepa, M., Janardhanan, V. M., and Sahu, K. C. (2017). Paper based hydrazine monohydrate fuel cells with Cu and C composite catalysts. **Electrochimica Acta**, 232, 262-270.
62. Verma, R., Lal, S., Deepa, M., Janardhanan, V. M., and Sahu, K. C. (2017). Sodium percarbonate based, mixed-media fuel cells supported on paper with gold/nickel oxide catalysts. **ChemElectroChem**, 4 (2), 310-319.

## 2016

63. Sahu, K. C. (2016). Double-diffusive instability in core-annular pipe flow. **Journal of Fluid Mechanics**, 789, 830-855.
64. Sahu, K. C., and Govindarajan, R. (2016). Linear stability analysis and direct numerical simulation of two-layer channel flow. **Journal of Fluid Mechanics**, 798, 889-909.
65. Karapetsas, G., Sahu, K. C., and Matar, O. K. (2016). Evaporation of sessile droplets laden with particles and insoluble surfactants. **Langmuir**, 32 (27), 6871-6881.
66. Konda, H., Tripathi, M. K., and Sahu, K. C. (2016). Bubble motion in a converging-diverging channel. **ASME Journal of Fluids Engineering**, 138 (6), 064501.
67. Jotkar, M. R., Swaminathan, G., Sahu, K. C., and Govindarajan, R. (2016). Global linear instability of flow through a converging-diverging channel. **ASME Journal of Fluids Engineering**, 138 (3), 031301.
68. Bhagat, K. D., Tripathi, M. K., and Sahu, K. C. (2016). Instability due to double-diffusive phenomenon in pressure-driven displacement flow of one fluid by another in an axisymmetric pipe. **European Journal of Mechanics - B/Fluids**, 55, 63-70.

## 2015

69. Tripathi, M. K., Sahu, K. C., and Govindarajan, R. (2015). Dynamics of an initially spherical bubble rising in quiescent liquid. **Nature Communications**, 6, 6268.
70. Tripathi, M. K., Sahu, K. C., Karapetsas, G., Sefiane, K., and Matar, O. K. (2015). Non-isothermal bubble rise: non-monotonic dependence of surface tension on temperature. **Journal of Fluid Mechanics**, 763, 82-108.

71. Premrata, A. R., Tripathi, M. K., and Sahu, K. C. (2015). Dynamics of rising bubble inside a viscosity-stratified medium. **Physics of Fluids**, 27 (7), 072105.
72. Lal, S., Janardhanan, V. M., Deepa, M., Sagar, A., and Sahu, K. C. (2015). Low cost environmentally benign porous paper based fuel cells for micro-nano systems. **Journal of Electrochemical Society**, 162 (14), F1402-F1407.
73. Randive, P., Dalal, A., Sahu, K. C., Biswas, G., and Mukherjee, P. P. (2015). Wettability effects on contact line dynamics of droplet motion in an inclined channel. **Physical Review E**, 91, 053006.
74. Ghosh, S., Usha, R., and Sahu, K. C. (2015). Absolute and convective instabilities in double-diffusive two-fluid flow in a slippery channel. **Chemical Engineering Science**, 134, 1-11.
75. Tripathi, M. K., Sahu, K. C., Karapetsas, G., and Matar, O. K. (2015). Bubble rise dynamics in a viscoplastic material. **Journal of Non-Newtonian Fluid Mechanics**, 222, 217-226.
76. Wakale, A. B., Venkatasubbaiah, K., and Sahu, K. C. (2015). A parametric study of buoyancy-driven flow of two-immiscible fluids in a differentially heated inclined channel. **Computers and Fluids**, 117, 54-61.
77. Swain, P. A., Karapetsas, G., Matar, O. K., and Sahu, K. C. (2015). Numerical simulation of pressure-driven displacement of a viscoplastic material by a Newtonian fluid using the lattice Boltzmann method. **European Journal of Mechanics - B/Fluids**, 49, 197-207.
78. Nandakumar, N., Sahu, K. C., and Anand, M. (2015). Pulsatile flow of a shear-thinning model for blood through a two-dimensional stenosed channel. **European Journal of Mechanics - B/Fluids**, 49, 29-35.

#### 2014

79. Govindarajan, R., and Sahu, K. C. (2014). Instabilities in viscosity-stratified flow. **Annual Review of Fluid Mechanics**, 46, 331-353.
80. Sahu, K. C., and Govindarajan, R. (2014). Instability of a free-shear layer in the vicinity of a viscosity-stratified layer. **Journal of Fluid Mechanics**, 752, 626-648.
81. Tripathi, M. K., Sahu, K. C., and Govindarajan, R. (2014). Why a falling drop does not in general behave like a rising bubble. **Scientific Reports (Nature Publishing Group)**, 4, 4771.
82. Ghosh, S., Usha, R., and Sahu, K. C. (2014). Linear stability analysis of miscible two-fluid flow in a channel with velocity slip at the walls. **Physics of Fluids**, 26 (1), 014107.
83. Ghosh, S., Usha, R., and Sahu, K. C. (2014). Double-diffusive two-fluid flow in a slippery channel: A linear stability analysis. **Physics of Fluids**, 26 (12), 127101.
84. Sahu, K. C. (2014). A review on double-diffusive instability in viscosity stratified flows. **Proceedings of the National Academy of Sciences, India**, 80 (3), 513-524 (Invited Paper).
85. Kusuma, J. N., Matar, O. K., and Sahu, K. C. (2014). Numerical simulations of miscible channel flow with chemical reactions. **Current Science**, 106 (6), 841-852.
86. Karapetsas, G., Sahu, K. C., Sefiane, K., and Matar, O. K. (2014). Thermocapillary-driven motion of a sessile drop: effect of non-monotonic dependence of surface tension on temperature. **Langmuir**, 30 (15), 4310-4321.

#### 2013

87. Karapetsas, G., Sahu, K. C., and Matar, O. K. (2013). Effect of contact line dynamics on the thermocapillary motion of a droplet on an inclined plate. **Langmuir**, 29 (28), 8892-8906.
88. Redapangu, P. R., Chandra Sahu, K., and Vanka, S. P. (2013). A lattice Boltzmann simulation of three-dimensional displacement flow of two immiscible liquids in a square duct. **ASME Journal of Fluids Engineering**, 135 (12), 121202.
89. Sahu, K. C. (2013). Double diffusive effects on pressure-driven miscible channel flow: Influence of variable diffusivity. **International Journal of Multiphase Flow**, 55, 24-31.

#### 2012

90. Mishra, M., De Wit, A., and Sahu, K. C. (2012). Double diffusive effects on pressure-driven miscible displacement flows in a channel. **Journal of Fluid Mechanics**, 712, 579-597.
91. Redapangu, P. R., Chandra Sahu, K., and Vanka, S. P. (2012). A study of pressure-driven displacement flow of two immiscible liquids using a multiphase lattice Boltzmann approach. **Physics of Fluids**, 24 (10), 102110.
92. Sahu, K. C., and Govindarajan, R. (2012). Spatio-temporal linear stability of double-diffusive two-fluid channel flow. **Physics of Fluids**, 24 (5), 054103.
93. Redapangu, P. R., Vanka, S. P., and Sahu, K. C. (2012). Multiphase lattice Boltzmann simulations of buoyancy-induced flow of two immiscible fluids with different viscosities. **European Journal of Mechanics - B/Fluids**, 34, 105-115.

## 2011

94. Sahu, K. C., and Govindarajan, R. (2011). Linear stability of double-diffusive two-fluid channel flow. **Journal of Fluid Mechanics**, 687, 529-539.
95. Kumar Reddy, V. T. S. R., Janardhanan, V. M., and Sahu, K. C. (2011). Effects of wall-heating on the linear instability characteristics of pressure-driven two-layer channel flow. **Chemical Engineering Science**, 66 (23), 6272-6279.
96. Redapangu, P. R., Vanka, S. P., and Sahu, K. C. (2012). Multiphase lattice Boltzmann simulations of buoyancy-induced flow of two immiscible fluids with different viscosities. **Computers and Fluids**, 50 (1), 199-215.
97. Sahu, K. C., and Matar, O. K. (2011). Three-dimensional convective and absolute instabilities in pressure-driven two-layer channel flow. **International Journal of Multiphase Flow**, 37 (8), 987-993.
98. Sileri, D., Sahu, K. C., and Matar, O. K. (2011). Two-fluid pressure-driven channel flow with wall deposition and ageing effects. **Journal Engineering Mathematics**, 71, 109-130.
99. Sahu, K. C. (2011). The instability of flow through a slowly diverging pipe with viscous heating. **ASME Journal of Fluids Engineering**, 133 (7), 071201.
100. Swaminathan, G., Sahu, K. C., Sameen, A., and Govindarajan, R. (2011). Global instabilities in diverging channel flows. **Theoretical and Computational Fluid Dynamics**, 25, 53-64. (Special Issue).

## 2010

101. Sahu, K. C., and Matar, O. K. (2010). Three-dimensional linear instability in pressure-driven two-layer channel flow of a Newtonian and a Herschel-Bulkley fluid. **Physics of Fluids**, 22 (11), 112103.
102. Sahu, K. C., Ding, H., and Matar, O. K. (2010). Numerical simulation of non-isothermal pressure-driven miscible channel flow with viscous heating. **Chemical Engineering Science**, 65 (10), 3260-3267.
103. Sahu, K. C., and Matar, O. K. (2010). Stability of plane channel flow with viscous heating. **ASME Journal of Fluids Engineering**, 132 (1), 011202.

## 2005-2009

104. Sahu, K. C., Ding, H., Valluri, P., and Matar, O. K. (2009). Pressure-driven miscible two-fluid channel flow with density gradients. **Physics of Fluids**, 21 (4), 043603.
105. Sahu, K. C., Ding, H., Valluri, P., and Matar, O. K. (2009). Linear stability analysis and numerical simulation of miscible two-layer channel flow. **Physics of Fluids**, 21 (4), 042104.
106. Sahu, K. C., Sameen, A., and Govindarajan, R. (2008). The relative roles of divergence and velocity slip in the stability of plane channel flow. **European Physical Journal - Applied Physics**, 44 (1), 101-107.
107. Sahu, K. C., Valluri, P., Spelt, P. D. M., and Matar, O. K. (2007). Linear instability of pressure-driven channel flow of a Newtonian and a Herschel-Bulkley fluid. **Physics of Fluids**, 19 (12), 122101. (Erratum: *Physics of Fluids*, 2008, 20 (10), 109902).
108. Sahu, K. C., and Govindarajan, R. (2007). Linear instability of entry flow in a pipe. **ASME Journal of Fluids Engineering**, 129 (10), 1277-1280.
109. Venkatesh, T. N., Sarasamma, V. R., Rajalakshmy, S., Sahu, K. C., and Govindarajan, R. (2005). Super-linear speed-up of a parallel multigrid Navier-Stokes solver on Flosolver. **Current Science**, 88 (4), 589 - 593.
110. Sahu, K. C., and Govindarajan, R. (2005). Stability of flow through a slowly diverging pipe. **Journal of Fluid Mechanics**, 531, 325 - 334.

## Refereed Conference Papers

111. Gurralla, P., Katre, P., Balusamy, S., Banerjee, S., and Sahu, K. C. (13-17 December 2019). Effect of substrate temperature on evaporation of ethanol-water sessile droplet. Proceedings of the 16th Asian Congress of Fluid Mechanics, Bengaluru, India.
112. Balla, M., Tripathi, M. K., and Sahu, K. C. (28-31 December 2019). Non-isothermal bubble rise dynamics in a self-rewetting fluid at high Marangoni numbers. 25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMT-2019), IIT Roorkee, India.
113. Kanungo, D. K., Hensa, P. K. and Sahu, K. C. (10 - 12 December 2018). Dynamics of an air bubble rising in a shear-thinning fluid. Proceedings of the 7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP), IIT Bombay, India.
114. Reddy, D. V., Kannan, Y. S., Karri, B., and Sahu K. C. (10 - 12 December 2018). Dynamics of water and glycerol drops sliding down an inclined plane. Proceedings of the 7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP), IIT Bombay, India.
115. Gaurav, A., Agrawal, M., Karri B., and Sahu, K. C. (10 - 12 December 2018). Experimental study of two identical air bubbles rising side-by-side in water in 3D view. Proceedings of the 7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP), IIT Bombay, India.

116. Lal, S., Janardhanan, V. M., Deepa, M., and Sahu, K. C. (2017). Experimental and modeling studies of paper based methanol fuel cell. *ECS Transactions*, 80(10), 843.
117. Premlata, A. R., Tripathi, M. K., Karri, B. and Sahu, K. C. (27 - 30 December 2017). Dynamics of an air bubble rising in a shear-thinning fluid. *Proceedings of the 24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2017)*, Hyderabad, India.
118. Govindarajan, R., Jose, S., and Sahu, K. C. (11 - 15 April 2016). Instabilities in viscosity and density stratified flow. *IUTAM Symposium on Helicity, structures and singularity in fluid and plasma dynamics*, Venice, Italy.
119. Tripathi, M. K., and Sahu, K. C. (2015). Evaporating falling drop. *Procedia IUTAM*, 15, 201-206.
120. Redapangu, P. R., and Sahu, K. C. (22 - 23 February 2013). Three-dimensional LBM simulations of buoyancy-driven flow using Graphics processing units. *4th National Conference on Parallel Computing Technologies (Parcomptech-2013)*, Bangalore, India.
121. Redapangu, P. R., Vanka, S. P., and Sahu, K. C. (9 - 12 December 2012). Interpenetration of two immiscible fluids in an oscillating channel using lattice Boltzmann method. *4th International Congress on Computational Mechanics and Simulation*, Hyderabad, India.
122. Mishra, M., De Wit, A., and Sahu, K. C. (19 - 24 August 2012). Double diffusivity on miscible fluid flow in a channel. *23rd International Congress of Theoretical and Applied Mechanics*, Beijing, China.
123. Redapangu, P. R., and Sahu, K. C. (23 - 27 July 2012). Three-dimensional lattice Boltzmann simulation of pressure-driven displacement flow of two immiscible liquids. *21st International Conference on Discrete Simulation of Fluid Dynamics*, Bangalore, India.
124. Vanka, S. P., Shinn, A. F., and Sahu, K. C. (11 - 17 November 2011). Computational fluid dynamics using graphics processing units: challenges and opportunities. *ASME 2011 International Mechanical Engineering Congress and Exposition*, Denver, Colorado, USA.
125. Sileri, D., Sahu, K., Ding, H., and Matar, O. K. (14 - 19 June 2009). Mathematical modelling of asphaltene deposition and removal in crude distillation units. *International Conference on Heat Exchanger Fouling and Cleaning*, Schladming, Austria.
126. Sahu, K. C., and Govindarajan, R. (22 - 25 May 2006). Instability of entry flow in a pipe. *Eleventh Asian Congress of Fluid Mechanics*, Kuala Lumpur, Malaysia.
127. Sahu, K. C. (2006). A possible linear instability mechanism in small-scale pipe flows. *Sixth IUTAM Symposium on Laminar-Turbulent Transition*, Springer Netherlands, 78, 127-132, ISSN: 0926-5112.

## INVITED TALKS

### International

1. "Hydrodynamic instability in two-layer channel flow involving non-Newtonian fluids", 20th International Workshop on Numerical Methods in Non-Newtonian Flows, Canada (June 6-9, 2021).
2. Keynote Speaker, "Behaviour of bubble/drop in non-isothermal system: normal fluid versus self-wetting fluid", 65th Congress of the Indian Society of Theoretical and Applied Mechanics (ISTAM) as per the recognition by International Union of Theoretical and Applied Mechanics (IUTAM), GITAM University, Hyderabad, India (9 - 11 December 2020).
3. "Strange bubble rise dynamics in self-wetting fluids", International Workshop on Numerical and Analytical Techniques in Engineering Problems, SRM Institute of Science and Technology, Tamil Nadu, India (12 - 13 November 2020).
4. "Wetting and spreading of a sessile droplet on complex microtextured surfaces", American Chemical Society, ACS Science Connect: Langmuir (10 - 12 October 2020).
5. Keynote talk: "Some peculiar behaviors observed in bubbles and droplets", International Conference on Recent Advances in Computational and Experimental Mechanics (ICRACEM), IIT Kharagpur (4 - 6 September 2020).
6. "Dynamics of drops with and without electric field", Indo-French Workshop on Electro-Hydro-Dynamics, IIT Kharagpur, 27 - 29 November 2019.
7. "Fluid dynamics of a bubble/droplet", Indo-German Symposium on Advanced Measurements and Multi-Scale CFD Simulations for Intensification of Multiphase Flow Processes, IIT Delhi, India (3 - 5 October 2018).
8. "Dynamics of bubble in isothermal and non-isothermal systems", Xi'an Jiaotong University, China (11 December 2018).
9. "Instabilities in viscosity-stratified flows", University of Chinese Academy of Sciences, Beijing, China (14 December 2018).
10. "Instabilities in Multiphase flow", International Conference on Numerical Heat Transfer and Fluid Flow (NHTFF 2018), NIT Warangal, Telangana, India (19 - 21 January 2018).

11. "Non-Isothermal Bubble Rise Dynamics in a Self-Rewetting Fluid", Symposium on Patterns and Dynamics in Multiphase and Interface Flows, University of Florida, Gainesville, Florida (15 - 16 November 2018).
12. "Some interesting phenomena in bubbles and drops", International Symposium on Computational Multiphase Flow, Ritsumeikan University, Japan (14 January 2015).
13. "Lattice Boltzmann simulation of pressure-driven displacement flow of immiscible liquids", Ritsumeikan University, Japan (15 January 2015).
14. "Linear stability of pressure-driven two-fluid channel flow", Indo-European Network on Advanced Instability Methods, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India (2010).
15. "Numerical simulations of two-fluid channel flows", Department of Mechanical Engineering, University of Illinois at Urbana-Champaign, USA (2010).

#### National

16. Keynote Speaker, "Bubbles and droplets", AICTE Training and Learning Academy, NIT Rourkela (11 - 15 October 2021).
17. Keynote Speaker, "Behaviour of bubbles/droplets in non-isothermal systems", Faculty Development Program on Microfluidics, Soft Matter and their Applications, NIT Calicut (6-10 September 2021).
18. Keynote Speaker, "Thermocapillarity driven bubbles and droplets", Faculty Development Program on Advanced Engineered Surfaces for Phase Change Heat Transfer Application (AESPHTA21), NIT Calicut (12 - 16 July 2021).
19. "Bubbles and Drops: Natural Phenomena to Industrial Applications", Bi-weekly Seminar Series, Department of Mechanical Engineering, IIT Delhi (10 February 2021).
20. Keynote Speaker, "Hydrodynamic instability in Multiphase flow", A National Five Day Webinar Program on Fluid Dynamics from Mathematicians Viewpoint, GITAM University Hyderabad, India (9-13 August, 2020).
21. "Instability in viscosity-stratified flow", Workshop on Large Scale CFD Modelling of the Hydrodynamics and Scour around Offshore Wind Farms sponsored by Science and Engineering Research Board (SERB), IIT Kharagpur (27 January 2020).
22. "Evaporation of an ethanol-water sessile droplet", Sadhana: Discussion Meeting on Droplet Evaporation and Condensation, Indian Institute of Science, Bangalore (24 January 2020).
23. "Dynamics of bubble in isothermal and non-isothermal systems", National Conference on Computational Modelling of Fluid Dynamics Problems (CMFDP-2019), NIT Warangal, Telangana, India (18 - 20 January 2019).
24. "Pipe flow instabilities", AICTE Sponsored Workshop, IIT Madras, India (26 - 31 March 2018).
25. "Bubbles and drops: natural phenomena to industrial applications", Fluid Mechanics and Fluid Power, Kerala, India (14 - 16 December 2017).
26. "Dynamics of a bubble", Summer School and Discussion Meeting on Buoyancy-Driven Flows, International Centre for Theoretical Sciences, Bangalore, India (16 - 20 June 2017).
27. "Topological change and path instability in rising air bubble", Advances in Theoretical Fluid Mechanics (Indian Mathematical Society), Kolkata, India (27 - 30 December 2016).
28. "Shapes and paths of an air bubble rising in quiescent liquids", Complex Fluids- CompFlu-2016, Hyderabad, India (12 - 14 December 2016).
29. "Dynamics of a rising bubble in a self-rewetting fluid: three-dimensional effects", National Symposium on Multiphase Flow, Durgapur, India (22 - 25 February 2016).
30. "Instabilities in viscosity-stratified flows", Mechanical and Chemical Engineering Departments, IIT Guwahati (12 - 13 March 2014).
31. "Instabilities in viscosity-stratified flows", IIT Kanpur (10 March 2014).
32. "Viscosity stratification and instabilities in simple shear flows", National Geophysical Research Institute, Hyderabad, India (18 December 2013).
33. "Double-diffusive instability in viscosity-stratified flows", 79th Annual Meeting of Indian Academy of Sciences (Chandigarh, India) (8-10 November 2013).
34. "Lattice Boltzmann simulation of pressure-driven displacement flow of immiscible liquids", IIT Ropar (7 November 2013).
35. "Instabilities due to viscosity stratification in miscible channel flow", TIFR Centre for Applicable Mathematics, Bangalore (29 August 2013).
36. "Double-diffusive instabilities", Fluid Days 2013 (for 80th Birthday of Prof. Roddam Narasimha), Centre for Atmospheric and Oceanic Sciences (CAOS), Indian institute of Science (18 - 20 July 2013).
37. Pedagogical talk: "Double-diffusive instabilities in viscosity-stratified flow", TCIS Symposium, TIFR Centre for Interdisciplinary Sciences, TIFR Hyderabad (2012).
38. "Convective and absolute instabilities in pressure-driven two-layer channel flow", Advanced Instability Methods (AIM) for Fluid Mechanics and Combustion, Indian Institute of Technology Bombay, Mumbai, India (2012).



39. "Multiphase lattice Boltzmann simulations of buoyancy-driven flow", CSIR Centre for Mathematical Modeling and Computer Simulation, India (2011).
40. "Multiphase lattice Boltzmann simulations using graphics processing unit (GPU)", Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India (2011).
41. "Linear stability analysis and numerical simulation of miscible channel flow", Central Mechanical Engineering Research Institute, Durgapur, India (2009).

\* In addition, delivered over 100 contributed talks at various other conferences/meetings.

## RESEARCH STUDENTS SUPERVISED/CO-SUPERVISED

- PhD: Seven (Ongoing) + Seven (Graduated)
- M.Tech: One (Ongoing) + Eleven (Graduated)

### Details of PhD students (graduated)

PhD student	Year	My role	Current position
Meenu Agrawal	2021	Co-supervisor	Shizuoka University, Japan (joining soon)
Mounika Balla	2021	Supervisor	Research Associate, IIT Hyderabad
Deepak Kumar Kanungo	2020	Supervisor	Deputy Manager, BHEL R&D, Hyderabad
Sweta Lal	2019	Supervisor	Assistant Professor, IISER Bhopal
Premlata Amarnath Ram	2018	Supervisor	Research Associate, NCKU Taiwan
Manoj Kumar Tripathi	2015	Supervisor	Assistant Professor, IISER Bhopal
Prasanna Rani Redapangu	2014	Supervisor	Faculty, Mekelle University, Ethiopia

\* Six other PhD students worked with me in part (but I am not their official supervisor)

## INTERNATIONAL RESEARCH VISITS (AS A FACULTY)

- University of Illinois Urbana-Champaign, USA (December, 2010)
- Ritsumeikan University, Japan (November-December, 2014 and 2015)
- University of Chinese Academy of Sciences, Beijing (December 2018)

## RESEARCH GRANTS

Title	Agency	Amount	Status
Effects of phase change, coalescence and breakup on raindrop dynamics	SERB (CRG)	56,07,859 (INR)	Approved (2021-2024)
Linear stability of interfacial flows of fluids with complex rheology	SERB (MATRICS)	6,60,000 (INR)	Ongoing (2018-2021)
Fluid dynamics of bubbles and drops	INSA (Young Scientist Award)	15,00,000 (INR)	Complete (2015-2018)
Development and applications of high performance LBM for multiphase flows	DST (Young Scientist Award)	14,92,000 (INR)	Complete (2012-2015)
Prediction of metal temperature of RH tubes in BHEL Boilers	BHEL Hyderabad	7,50,000 (INR)	Complete (2015)
Instabilities in multiphase flows	IIT Hyderabad	15,00,000 (INR)	Complete (2010-2012)
Modeling of contour-current flow in structured packings (with Prof. O. K. Matar and Prof. G. Hewitt)	Air Liquide, France	~£10,000	Complete (2008)

### Other travel grants

- Science and Engineering Research Board (SERB), India to attend 72nd Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Seattle, USA (23-26 November 2019).
- Department of Science and Technology (DST), India to attend 64th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Baltimore, USA (20-22 November 2011).
- Council of Scientific and Industrial Research (CSIR), India to attend Eleventh Asian Congress of Fluid Mechanics, Kuala Lumpur, Malaysia (22-25 May 2006).

- International Centre for Theoretical Physics, Italy to attend Introduction to Microfluidics, Trieste, Italy (8-26 August 2005).

## OTHER NOTABLE PROFESSIONAL ACTIVITY

### At IIT Hyderabad

- Member of the Research Advisory Committee, IIT Hyderabad (September 2020 - Present)
- Warden, PG hostels, IIT Hyderabad (October 2011-2015)
- Laboratories Development at IIT Hyderabad: Computer-Aided Engineering; Fluid Mechanics

### Other

- Member on Advisory Committee - Recruitment Panel, CBIT Hyderabad (2021)
- Advisory Board Member, "International Conference on Recent Advances in Computational and Experimental Mechanics", IIT Kharagpur, 4 – 6 Sept 2020.
- **National responsibility:** Member of National Board of Accreditation (2018 - Present)
- Lead Organiser, "IUTAM Symposium on Multiphase Flows with Phase Change: Challenges and Opportunities", IIT Hyderabad, 8 – 11 Dec 2014.
- External Examiner of Several PhD Theses (from IITs, IISc and NUS Singapore)
- Co-organiser, "21st International Conference on Discrete Simulation of Fluid Dynamics", JNCASR Bangalore, 23 – 27 July 2012.
- Organiser, "Computational Fluid Dynamics on GPUs" (2010). **First workshop of this kind in India**
- Member of American Physical Society (Division of Fluid Dynamics)
- Board of Studies, Chemical Engineering, JNTU Kakinada (2016), GMR Institute of Technology Srikakulam (2018)