### K. Nandakumar Department of Chemical and Materials Engineering, University of Alberta, Edmonton, AB, T6G 2G6, Canada

# PUBLICATIONS IN REFEREED JOURNALS

- R1. C. Veeramani, P. D. Minev and K. Nandakumar, A Fictitious Domain Formulation for Flows with Rigid Particles: a non-Lagrange multiplier version, *J. Comp. Physics*, Accepted Oct 19, 2006.
- R2. AKM M. Murshed, Biao Huang; and K. Nandakumar, Control relevant modeling of planer solid oxide fuel cell system, accepted Sept 29, 2006 *J. Power Sources* (2006)
- R3. **Abbaspour Ali**, K. Nandakumar, Jingli Luo and Karl T. Chuang, A novel approach to study the structure versus performance relationship of SOFC electrodes, *J. Power Sources* (2006) (in press)
- R4. **D. Monder**, K. Nandakumar and K. T. Chuang, Modeling of SOFC using H<sub>2</sub>S as Fuel, communicated to *J. Power Sources*, *162* (2006) 400-414.
- R5. Veeramani C, Minev PD, Nandakumar K A fictitious domain method for particle sedimentation, *LECTURE NOTES IN COMPUTER SCIENCE* **3743**: (2006) 544-551.
- R6. Cunkui Huang, K. Nandakumar, Phillip Y. K. Choi and Larry W. Kostiuk, Molecular Dynamics Simulation of a Pressure-Driven Liquid Transport Process in a Cylindrical Nanopore Using two Self-Adjusting Plates, *The Journal of Chemical Physics* 124 (2006) 234701-1.
- R7. Chen, H., U. Sundararaj and K. Nandakumar, Erosion of polymer pellets during blending in a twin-screw extruder, *AIChEJ* 52 (2006) 1267-1270.
- R8. Chen, T., P.D. Minev and K. Nandakumar, A projection scheme for incompressible multiphase flow using adaptive Eulerian grid: 3D validation, *Int. J. Numerical Methods in Engineering* 48 (2005) pp455-466.
- R9. Wen, X., A. Afacan, K. Nandakumar and K .T. Chuang, Development of a novel vertical-sheet structured packing, *Chemical Engineering Research and Design* 83(A5) (2005) pp515–526.
- R10. Weixing Wang, Zhiang Zhou, K. Nandakumar, Jacob H. Masliyah and Zhenghe Xu, An induction time model for the attachment of an air bubble to a hydrophobic sphere in aqueous solutions, *Int. J. Miner. Process.* **75** (2005) pp69-82.
- R11. Chen, H., U. Sundararaj, K. Nandakumar and M. D. Wetzel, On-line visualization of PS/PP melting mechanism in a co-rotating twin-screw extruder, *International Polymer Processing XIX* (2004) pp342–439.
- R12. Chen, H., U. Sundararaj, K. Nandakumar and M. D. Wetzel, Investigation of melting mechanism in a twin-screw extruder using a pulse method and on-line measurement, *Ind. & Eng Chem Research* 43 (2004) pp6822–6831.
- R13. R. Sean Sanders, M. Mahbubur Razzaque, Jason Schaan, K. Nandakumar, Jacob H. Masliyah, Artin Afacan and Shijie Liu, Bubble Size Distributions for Dispersed Air-Water Flows in a 100mm Horizontal Pipeline, *Can. J. Chem. Eng.* 82 (2004) pp858-864.

- R14. Manoj Luthra, Robert E. Lopetinsky, R. Sean Sanders, K. Nandakumar and Jacob H. Masliyah, A new device to determine bitumen extraction from oil sands, *Can. J. Chem. Eng.* 82 (2004) pp752–762.
- R15. G. Gu, R. Sean Sanders, K. Nandakumar, Z. Xu and Jacob H. Masliyah, Hydrogen and Oxygen Bubble Attachment to a Bitumen Drop, *Can. J. Chem. Eng.* 82 (2004) pp846-849.
- R16. Chen, H., U. Sundararaj and K. Nandakumar, Modeling of polymer drop de-formation and breakup during melting under shear flow, *Poly. Eng. Sci.* **44** (2004) pp1259–1266.
- R17. Yin, F. H., J. L. Midgley, A. Afacan, K. Nandakumar and K. T. Chuang, CFD simulation and experimental study of flow in packed bubble columns, *Chem. Eng. Commun.* 191 (2004) pp1417–1436.
- R18. Weixing Wang, Zhiang Zhou, K. Nandakumar, Zhenghe Xu and Jacob H. Masliyah, Effect of charged colloidal particles on adsorption of surfactants at oil-water interface, *J. Colloid and Interface Science* **274** (2004) pp625-630.
- R19. Tong Chen, P. D. Minev, and K. Nandakumar, A 3D Projection Scheme for Incompressible Multiphase Flows Using Dynamic Front Refinement and Reconnection, *LECTURE NOTES IN COMPUTER SCIENCE* **2907** (2004) pp17–24.
- R20. Chen, T. P. D. Minev and K. Nandakumar, A projection scheme for incompressible multiphase flow using adaptive Eulerian grid, *Int. J. Numerical Methods in Fluids* 45 (2004) pp1-19.
- R21. Basu, S., K. Nandakumar, S. Lawrence and J. H. Masliyah, Effect of Calcium Ion and Montmorillonite Clay on Bitumen Displacement by Water on a Glass Surface, *Fuel* 83 (2004) pp17–22.
- R22. Guoxing Gu, R. Sean Sanders, K. Nandakumar, Zhenghe Xu and Jacob H. Masliyah, A novel experimental technique to study single bubble-bitumen attachment in flotation, *Int. J. Miner. Process.* **74** (2004) pp15–29.
- R23. Wen, X., A. Afacan, K. Nandakumar and K. T. Chuang, A geometry based model for predicting mass transfer in packed columns, *Ind. & Eng Chem Research* 42 (2003) pp5373-5382.
- R24. Monjur Murshed, A. K. M., Biao Huang, K. Nandakumar, Control of Chaos in a Convective Loop System, *Nonlinear Dynamics and Systems Theory* 3 (2003) pp203– 226.
- R25. Diaz-Goano, C., P. D. Minev and K. Nandakumar, A fictitious domain/finite element method for particulate flows, J. Comp. Physics 192 (2003) pp105–123.
- R26. Razzaque, Mahbubur M., A. Afacan, S. Liu, K. Nandakumar, J. H. Masliyah and R. Sean Sanders, Bubble size in coalescence dominant regime of turbulent air-water flow through horizontal pipes, *Int. J. Multiphase Flow* 29 (2003) pp1451-1471.
- R27. Chen, H., U. Sundararaj and K. Nandakumar, Experimental and simulation studies of heat transfer in polymer melts, *AIChEJ*. **49** (2003) pp1372-1382.
- R28. Wen, X., A. Afacan, K. Nandakumar and K. T. Chuang, A generalized approach to pressure drop predictions in packed beds based on detailed geometry of the packing, *J*.

Institution of Engineers Singapore, Chem. Eng. Issue 43 (2003) pp6-13.

- R29. Getye Gesit, K. Nandakumar and Karl T. Chuang, CFD modeling of the flow patterns and hydraulics of commercial scale sieve trays, *AIChEJ*. **49** (2003) pp910-924.
- R30. Weixing Wang, Zhiang Zhou, K. Nandakumar, Zhenghe Xu and Jacob H. Masliyah, Effect of surface mobility on the particle sliding along a bubble or a solid sphere, *J. Colloid and Interface Science* **259** (2003) pp81-88.
- R31. Minev, P. D., T. Chen and K. Nandakumar, A finite element technique for multifluid incompressible flow using Eulerian grids, *J. Comp. Physics* **187** (2003) pp255–273.
- R32. Gu, G., Z. Xu, K. Nandakumar and J. H. Masliyah, Effects of physical environment on induction time of air-bitumen attachment, Int. J. Miner. Process. 69 (2003) pp235–250.
- R33. Weixing Wang, Zhiang Zhou, K. Nandakumar, Zhenghe Xu and Jacob H. Masliyah, Attachment of Individual Particles to a Stationary Air Bubble in model systems, *Int. J. Miner. Process.* **68** (2003) pp47–69.
- R34. Gu, G., Z. Xu, K. Nandakumar and J. H. Masliyah, Influence of water-soluble and water-insoluble natural surface-active components on the stability of water in-toluenediluted bitumen emulsions, *Fuel* **81** (2002) pp1859-1869.
- R35. Selmi, M. and K. Nandakumar, Highly accurate solutions of the bifurcation structure of mixed convection heat transfer using spectral method, *Int. J. Numerical Methods in Fluids* 40 (2002) pp619–638.
- R36. Yin, F. H., A. Afacan, K. Nandakumar and K. T. Chuang, CFD Simulation and Experimental Study of Liquid Dispersion in Randomly Packed Metal Pall Ring, *Trans. Instn. Chem. Engrs.: part A. Chem. Eng. Res.* & Des. 80 (2002) pp135–143.
- R37. **Yin, F. H**., A. Afacan, K. Nandakumar and K. T. Chuang, Liquid Holdup Distribution in Packed Columns: Gamma Ray Tomography and CFD Simulation, *CEP* **41** (2002) pp473-483.
- R38. Wen, X., Y. Shu, K. Nandakumar and K. T. Chuang, Predicting the liquid flow in randomly packed beds from computer simulations, *AIChEJ*. **47** (2001) pp1170-1179.
- R39. C. Diaz-Goano, P. Minev & K. Nandakumar, A Lagrange multipliers/fictitious domain approach for particulate flow, *LECTURE NOTES IN COMPUTER SCIENCE* 2179 (2001) pp409-416.
- R40. Wang, Z., A. Afacan, K. Nandakumar and K. T. Chuang, Porosity distribution in random packed columns by gamma ray densitometry, *Chemical Engineering and Processing* **40** (2001) pp209-219.
- R41. Min-Hua Wang, B. Bara, L. Hackman, J. Czarnecki, A. Afacan, K. Nandakumar and J. H. Masliyah, Hydrodynamics in a gravity settling vessel: CFD modeling with LDA validation, *Can. J. Chem. Eng.* 78 (2000) pp1046-1055.
- R42. Yin, F. H., Z. C. Wang, A. Afacan, K. Nandakumar and K. T. Chuang, Experimental studies of liquid flow maldistribution in random packed column, *Can. J. Chem. Eng.* 78 (2000) pp449-457.
- R43. Basu S., K. Nandakumar and J. H. Masliyah, A study on daughter droplets formation in bitumen/glass/water contact line displacement due to instability, *FUEL* **79**:(7) (2000)

pp 837-841.

- R44. F. H. Yin, M. Song, A. Afacan, K. Nandakumar and K. T. Chuang, CFD Modeling of Mass Transfer in Randomly Packed Distillation Columns, *Ind. & Eng Chem Research* 39:(5) (2000) pp1369-1380.
- R45. C. G. Sun, F. H. Yin, A. Afacan, K. Nandakumar and K. T. Chuang, Modeling and simulation of flow maldistribution in random packed columns with gas-liquid countercurrent flow, *Trans. Instn. Chem. Engrs.: part A. Chem. Eng. Res. & Des.* 78 (2000) pp378-388.
- R46. Lakshminarayanan S, S. L. Shah, K. Nandakumar, Cramer's rule for non-square matrices, *AM MATH MON* **106**:(9) (1999) pp865-865.
- R47. Nandakumar, K., Y. Shu and K. T. Chuang, Predicting geometrical properties of randomly packed beds from computer simulation, *AIChEJ*. **45** (1999) pp2286-2297.
- R48. Nasr-El-Din, H. A., J. H. Masliyah and K. Nandakumar, Continuous separation of suspensions containing light and heavy particle species, *Can. J. Chem. Eng.* **77** (1999) pp1003-1012.
- R49. Selmi, M. and K. Nandakumar, Bifurcation study of flow through rotating curved ducts, *Physics of Fluids* **11** (1999) pp2030-2043.
- R50. Minev, P. D., U. Lange and K. Nandakumar, A comparative study of two-fluid models relevant to bubble column dynamics, *Journal of Fluid Mechanics* **394** (1999) pp73-96.
- R51. U. Lange, K. Nandakumar and H. Raszillier, Symbolic computation as a tool for highorder long-wave stability analysis of thin film flows with coupled transport processes, *J. Comp. Physics* **150** (1999) pp1-16.
- R52. Mehta, B., K. T. Chuang and K. Nandakumar, Model for liquid phase flow on sieve trays, *Trans. Instn. Chem. Engrs.: part A. Chem. Eng. Res. & Des.* **76** (1998) pp843-848.
- R53. Basu, S., K. Nandakumar and J.H.Malliyah, A visual study of high grade oil sand disintegtration process, *J. Colloid and Interface Science* **205** (1998) pp201-203.
- R54. Song, M., K. T. Chuang and K. Nandakumar, A Theoretical Correction of the Ouchiyama and Tanaka Formula for Predicting Average Porosity of Packed Beds Consisting of Nonuniform Spheres, *Ind. & Eng Chem Research* 37 (1998) pp3490-3496.
- R55. Song, M., F. H. Yin, K. T. Chuang and K. Nandakumar, A stochastic model for the simulation of the natural flow in random packed columns, *Can. J. Chem. Eng.* 76 (1998) pp183–189.
- R56. Basu, S., Kanda, W. C., K. Nandakumar and Jacob H. Masliyah, The effect of hydrophobic and hydrophilic clays on bitumen displacement by water on a glass surface, *Ind. & Eng Chem Research* 37 (1998) pp959–965.
- R57. Song, M., F. H. Yin, K. Nandakumar and K. T. Chuang, A Three-dimensional model for simulating the hydraulics in random packed columns, *Can. J. Chem. Eng.* 76 (1998) pp161–166.
- R58. Basu, S., K. Nandakumar and Jacob H. Masliyah, Effect of NaCl and MIBC/kerosene on bitumen displacement by water on a glass surface, *Collids & Surfaces A*:

Physicochemical and Engineering Aspects 136 (1998) pp71-80.

- R59. Basu, S., K. Nandakumar and Jacob H. Masliyah, A model for detachment of a partially wetting drop from a solid surface by shear flow, *J. Colloid and Interface Science* **190** (1997) pp253-257.
- R60. Lakshminarayanan, S., Sirish L. Shah and K. Nandakumar, Modeling and control of multivariable processes: dynamic PLS approach, *AIChEJ*. **43** (1997) pp2307-2322.
- R61. Choi, E., A. Chakma and K. Nandakumar, A bifurcation study of natural convection in porous media with internal heat sources: the non-Darcy effects, *Int. J. Heat Mass Transfer* 41 (1997) pp383-392.
- R62. S. Lakshminarayanan, Sirish L. Shah and K. Nandakumar, A Case Study of Nonlinear Modelling and Control using Partial Least Squares, *Special Chemical Engineering Issue of the Journal of the Institution of Engineers (IES) Singapore* 37(2) (1997) pp21–28.
- R63. Basu, S., K. Nandakumar and J. H. Masliyah, On bitumen liberation from oil sands, *Can. J. Chem. Eng.* **75** (1997) pp476–479.
- R64. Song, M., K. Nandakumar and K. T. Chuang, The correct mathematical description and a suggested solution method for a model in packed columns, *The Chemical Engineering Journal* **66** (1997) pp149–150.
- R65. Alleborn, N., K. Nandakumar, H. Raszillier and F. Durst, Further contributions on the two-dimensional flow in a sudden expansion, *Journal of Fluid Mechanics* 330 (1997) pp169–188.
- R66. Mees, P. A. J., K. Nandakumar and J.H. Masliyah, Steady spatial oscillations in a curved duct of square cross-section, *Physics of Fluids A* **8** (1996) pp3264–3270.
- R67. Mees, P. A. J., K. Nandakumar and J.H. Masliyah, Secondary instability of flow in a curved duct of square cross-section, *Journal of Fluid Mechanics* **323** (1996) pp387–409.
- R68. Basu, S., K. Nandakumar and J. H. Masliyah, A study of oil displacement on model surfaces, *J. Colloid and Interface Science* **182** (1996) pp82-94.
- R69. Mees, P. A. J., K. Nandakumar and J.H.Masliyah, Instability and transitions of flow in a curved duct: the development of two pairs of Dean vortices, *Journal of Fluid Mechanics* **314** (1996) pp227-246.
- R70. Chen, H. B., W. H. Finlay, K. Nandakumar and H. C. Ku, Viscous flow through a 3-D rotating channel: A pseudospectral matrix method approach, *Int. J. Numerical Methods in Fluids* 23 (1996) pp379–396.
- R71. Lakshminarayanan, S., Sirish L. Shah and K. Nandakumar, Identification of Hammerstein Models using Multivariate Statistical Tools, *Chem. Eng. Sci.* 50 (1995) pp3599-3613.
- R72. Ravi K. Sharma and K. Nandakumar, Multiple, two-dimensional solutions in a rotating straight pipe, *Physics of Fluids* 7 (1995) pp1568-1575.
- R73. Guiasu, I, H. Raszillier and K. Nandakumar, Symbolic computation of laminar flow in a uniformly heated horizontal pipe, *Int. J. Computational Fluid Dynamics* 3 (1994) pp193-216.

- R74. **Ryland, D. K.** and K. Nandakumar, A bifurcation study of convective heat transfer in a Hele-Shaw cell , *Can. J. Chem. Eng.* **72** (1994) pp457-467.
- R75. Selmi, M., K. Nandakumar and W. F. Finlay, A bifurcation study of viscous flow through a rotating, curved duct, *Journal of Fluid Mechanics* **262** (1994) pp353-375.
- R76. Ravi Sankar, S., P. A. J. Mees and K. Nandakumar, Development of threedimensional, streamwise periodic flows in the mixed-convection heat transfer, *Journal of Fluid Mechanics* 255 (1993) pp683-706.
- R77. Nandakumar, K. and H. J. Weinitschke, Asymmetric solutions of the reaction-diffusion equation, *Proc. Roy. Soc. London* **443** (1993) pp39-58.
- R78. Nandakumar, K., P.A.J. Mees and J. H. Masliyah, Multiple, two-dimensional solutions to the Dean problem in curved triangular ducts, *Physics of Fluids A* 5 (1993) pp1182– 1187.
- R79. Bara, B., K. Nandakumar and J.H. Masliyah, An experimental and numerical study of the Dean problem: flow development towards two-dimensional, multiple solutions, *Journal of Fluid Mechanics* 244 (1992) pp339-376.
- R80. Nandakumar, K. and H.J. Weinitschke, A bifurcation study of chemically driven convection in a porous medium, *Chem. Eng. Sci.* **47** (1992) pp4107-4120.
- R81. Ryland, D.K. and K. Nandakumar, A bifurcation study of convective heat transfer in porous media. part II. Effect of tilt on stationary and nonstationary solutions, *Physics* of *Fluids A* 4 (1992) pp1945-1958.
- R82. Nandakumar, K., H. Raszillier and F. Durst, Flow through rotating rectangular ducts, *Physics of Fluids A* **3** (1991) pp770-781.
- R83. Nandakumar, K. and H.J. Weinitschke, A bifurcation study of mixed-convection heat transfer in horizontal ducts, *Journal of Fluid Mechanics* **231** (1991) pp 157-187.
- R84. Islam, M. R. and K. Nandakumar, Transient convection in saturated porous layers with internal heat sources, *Int. J. Heat Mass Transfer* **33** (1990) pp151-161.
- R85. Nasr-El-Din, H., J. H. Masliyah and K. Nandakumar, Continuous gravity separation of concentrated bidisperse suspensions in a vertical column, *Chem. Eng. Sci.* 45 (1990) pp849-857.
- R86. Weinitschke, H. J., K. Nandakumar and S. Ravi Sankar, A bifrucation study of convective heat transfer in porous media, *Physics of Fluids A* **2** (1990) pp912-921.
- R87. Finlay, W. H and K. Nandakumar, Onset of two-dimensional cellular flow in finite curved channels of large aspect ratio, *Physics of Fluids A* **2** (1990) pp1 163-1174.
- R88. Islam, M. R., A. Chakma and K. Nandakumar, Cellular pattern evolution and roll cell instability in porous media convection with density extremum fluid, *Can. J. Chem. Eng.* 68 (1990) pp777-785.
- R89. Nasr-El-Din, H., J. H. Masliyah and K. Nandakumar, Continuous gravity separation of concentrated bidisperse suspensions in an inclined plate settler, *Int. J. Multiphase Flow* 16 (1990) pp909-919.
- R90. Hayes, R. E., K. Nandakumar and H. Nasr-El-Din, Steady laminar flow in a 90 planar

degree branch, Computers & Fluids 17 (1989) pp537-553.

- R91. Masliyah, J. H., H. Nasr-El-Din, and K. Nandakumar, Continuous separation of bidisperse suspensions in inclined channels, *Int. J. Multiphase Flow* 15 (1989) pp815-829.
- R92. Hayes, R. E. and K. Nandakumar, Heat transfer in a 90 degree planar branch, *Numerical Heat Transfer* **16** (1989) pp287-308.
- R93. Islam, R. M. and K. Nandakumar, Mixed convection heat transfer in porous media in the non-Darcy regime, *Can. J. Chem. Eng.* 66 (1988) pp68-74.
- R94. Hin-Sum Law, Robert S. MacTaggart, K. Nandakumar and Jacob H. Masliyah, Settling of heavy and buoyant particles from a suspension in inclined channel, *Journal of Fluid Mechanics* **187** (1988) pp301-318.
- R95. Ravi Sankar, S., K. Nandakumar and J. H. Masliyah, Oscillatory flows in coiled square ducts, *The Physics of Fluids* **31** (1988) pp1348-1359.
- R96. MacTaggart, R. S., David Hin-Sum Law, J. H. Masliyah and K. Nandakumar, Gravity separation of concentrated bidisperse suspensions in inclined plate settlers, *Int. J. Multiphase Flow* **14** (1988) pp519-532.
- R97. Nasr-El-Din, H., J. H. Masliyah, K. Nandakumar & David Hin-Sum Law, Continuous gravity separation of bidisperse suspension in a vertical column, *Chem. Eng. Sci.* 43 (1988) pp3225-3234.
- R98. Hin-Sum Law, Jacob H. Masliyah and Nandakumar, K., Effect of non-uniform heating on laminar mixed convection in ducts, *Trans. ASME Journal of Heat Transfer* 109 (1987) pp131-137.
- R99. Fung, L., K. Nandakumar and J. H. Masliyah, Bifurcation phenomena and cellular flow development in mixed convection heat transfer, *Journal of Fluid Mechanics* 177 (1987) pp339-357.
- R100. Hin-Sum Law, Jacob H. Masliyah, Robert S. Mac Taggart and K. Nandakumar, Gravity separation of bidisperse suspensions: light and heavy particle species, *Chem. Eng. Sci.* **42** (1987) pp1527-1538.
- R101. Hin-Sum Law, J. H. Masliyah and K. Nandakumar, Ablation of oil sands under the influence of turbulent axisymmetric jets, *AOSTRA J of Research* **3** (1987) pp177-182.
- R102. Hin-Sum Law, Jacob H. Masliyah and K. Nandakumar, Ablation of ice-solids and wax-solids mixtures, *Can. J. Chem. Eng.* **65** (1987) pp420-429.
- R103. **Islam, R. M**. and Nandakumar, K., Multiple solutions for buoyancy-induced flow in fluid saturated porous media for large Peclet number, *Trans. ASME Journal of Heat Transfer* **108** (1986) pp866-871.
- R104. Shanthini, W. and K. Nandakumar, Bifurcation phenomena of generalized Newtonian fluids in curved rectangular ducts, *Journal of non-Newtonian Fluid Mechanics* 22 (1986) pp35-60.
- R105. Tomcej, R. and K. Nandakumar, Mixed convection flow of a power-law fluid in ducts, *Can. J. Chem. Eng.* 64 (1986) pp743-751.

- R106. Ravi Sankar, S., K. Nandakumar and Jacob H. Masliyah, Mixed convection in heated curved ducts, Proc. of the 4th Int. Conf. on Heat Transfer, San Francisco (1986) pp1407-1412.
- R107. Nandakumar, K., J. H. Masliyah and Hin Sum Law, Bifurcation in steady laminar mixed convection flow in horizontal ducts, *Journal of Fluid Mechanics* 152 (1985) pp145-161.
- R108. Masliyah, J. H., K. Nandakumar, F. Hemphill and L. Fung, Numerical solution of flow under sluice gates using boundary-fitted coordinates, *Journal of Hydraulics Engineering* **111** (1985) pp922-933.
- R109. Masliyah, J. H. and K. Nandakumar, Fully developed laminar flow in a helical tube of finite pitch, *Chem. Eng. Commun.* **29** (1984) pp125-138.
- R110. Nandakumar, K. and J. H. Masliyah, Steady laminar flow through twisted pipes: Fluid flow and heat transfer in rectangular tubes, *Chem. Eng. Commun.* 21 (1983) pp151-173.
- R111. Nandakumar, K. and J. H. Masliyah, Steady flow past a permeable sphere at intermediate Reynolds numbers, *Can. J. Chem. Eng.* **60** (1982) pp202-211.
- R112. Nandakumar, K. and J. H. Masliyah, Bifurcation in steady laminar flow through curved tubes, *Journal of Fluid Mechanics* **119** (1982) pp475-490.
- R113. Nandakumar, K. and R. P. Andres, Minimum Reflux Conditions: Theory, *AIChEJ* **27** (1981) pp450-460.
- R114. Nandakumar, K. and R. P. Andres, Minimum Reflux Conditions: Numerical Solution, *AIChEJ* 27 (1981) pp460-465.
- R115. Masliyah, J. H. and K. Nandakumar, Steady Laminar Flow Through Twisted Pipes: Fluid Flow in Square Tubes, *Trans. ASME Journal of Heat Transfer* **103** (1981) pp785-790.
- R116. Masliyah, J. H. and K. Nandakumar, Steady laminar flow through twisted pipes: Heat transfer in square tubes, *Trans. ASME Journal of Heat Transfer* **103** (1981) pp791-796.
- R117. Masliyah, J. H. and K. Nandakumar, Fully Developed Viscous Flow and Heat Transfer in Curved Semi Circular Sectors, *AIChEJ* **25** (1979) pp478-487.
- R118. Masliyah, J. H. and K. Nandakumar, Fluid Flow and Heat Transfer in Internally Finned Helical Coils, *Can. J. Chem. Eng.* **55** (1977) pp27-36.
- R119. Masliyah, J. H. and K. Nandakumar, Heat Transfer in Internally Finned Tubes, *Trans. ASME Journal of Heat Transfer* **98** (1976) pp257-261.
- R120. Masliyah, J. H. and K. Nandakumar, Flow Transition in Finned Tubes, *I & EC Fund*. **15** (1976) pp144-146.
- R121. Nandakumar, K. and J. H. Masliyah, Fully Developed Viscous Flow in Internally Finned Tubes, *The Chemical Engineering Journal* **10** (1975) pp113-116.

### **INVITED CONTRIBUTIONS**

R122. K. Nandakumar and K. T. Chuang, Distillation tray column: Performance,

Encyclopedia of Separation Science, Ed. Ian Wilson, Academic Press, , (1999) pp.

- R123. Chuang, K. T. and K. Nandakumar, Distillation tray column: Design, *Encyclopedia of Separation Science*, Ed. Ian Wilson, Academic Press, , (1999) pp.
- R124. Nandakumar, K., K. T. Chuang, M. Song and F. H. Yin, Recent advances on modeling separation processes in random packed columns, *Recent research developments in chemical engineering*, ed. S. G. Pandalai, Transworld Research Network, vol. 3, (1999) pp87-106.
- R125. Nandakumar, K. and J. H. Masliyah, Swirling flow and heat transfer in coiled and twisted pipes, *Advances in Transport Processes*, ed. A. S. Mujumdar and R. A. Mashelkar, Wiley Eastern Ltd., Vol. IV, (1986) pp49-112.
- R126. Nandakumar, K. and J. H. Masliyah, Chap. 26 Swirl flow generated by twisted pipes and tape inserts, *Encyclopedia of Fluid Mechanics* - Dynamics of Single-Fluid Flows and Mixing, ed. N. P. Cheremisinoff, Gulf Publishing, Volume 2, (1985) pp691-706.
- R127. Nandakumar, K., Book review on "Transport Processes in Bubbles, Drops, and Particles", appeared in *Can. J. Chem. Eng.*, edited by R. P. Chhabra and D. De Kee, Hemisphere Publishing Corporation, New York, (1992) pp255 + ix pages.

## **CONFERENCE PRESENTATIONS**

- C1. <u>Cunkui Huang</u>, K. Nandakumar, Pillip Choi and Larry W. Kostiuk, A molecular dynamics study of liquid transport through a nanopore driven by constant pressure differences, Nanoforum Canada 2006, June 20 to 22, 2006.
- C2. <u>Cunkui Huang</u>, K. Nandakumar, Pillip Choi and Larry W. Kostiuk, Investigation of liquid transport/diffusion through a nanopore driven by a constant pressure/chemical potential difference, APS March Meeting 2006, March 13 to 17, 2006.
- C3. <u>Ali Abbaspour</u>\*, K. Nandakumar, Karl T. Chuang and Jingli Luo, A New Approach to Study the Structure vs Performance Relationship of SOFC Electrodes, *7th EUROPEAN SOLID OXIDE FUEL CELL FORUM*, Lucerne, Switzerland, July 3-7, 2006.
- C4. <u>Y. Bai</u>, U. Sundararaj, and K. Nandakumar, Modeling an internal batch mixer for polymer processing, 56<sup>th</sup> Canadian Chemical Engineering Conference, Sherbrooke, Quebec, CANADA, Oct. 15-18, 2006.
- C5. K. Alemaskin, K. Nandakumar and U. Sundararaj, Progressive cavity pumps CFD simulation, 56<sup>th</sup> Canadian Chemical Engineering Conference, Sherbrooke, Quebec, CANADA, Oct. 15-18, 2006.
- C6. <u>C. Veeramani, Peter. D. Minev, K. Nandakumar, A Scalable parallel implementation</u> for Direct Numerical Simulation of Particulate flows, *12th SIAM Conference on Parallel Processing for Scientific Computing*, February 20th – 24th, 2006, San Francisco, California, USA.
- C7. K. Ekambara, S. R. Sanders, K. Nandakumar and J. H. Masliyah, 3D modeling of gasliquid flow in horizontal pipes, *OilSands 2006*, Edmonton, Alberta, CANADA, Feb 22-24, 2006.

- C8. <u>Y. Bai</u>, U. Sundararaj, and K. Nandakumar. Modification and Scale-up of the new miniature mixer-APAM. ANTEC 2006, Charlotte, North Carolina, USA, May 7-11, 2006
- C9. <u>D. Monder</u>, K. Nandakumar and K. T. Chuang, "Reaction Mechanisms for a H<sub>2</sub>S fuelled Solid Oxide Fuel Cell", *Canadian Fuel Cell Systems Symposium*, Banff, October 12-14, 2005.
- C10. <u>A.K.M. Murshed</u>\*, B. Huang and K. Nandakumar, Study of dynamic modeling and control of Solid Oxide Fuel Cell at System Level, 55<sup>th</sup> Canadian Chemical Engineering Conference, Toronto, Oct. 16-19, 2005.
- C11. Dayadeep Monder\*, K. Nandakumar and Karl T. Chuang, Modeling a Hydrogen Sulfide SOFC, presented at the *Ninth International Symposium on Solid Oxide Fuel Cells*, Quebec City, May 2005. (poster session)
- C12. Dayadeep Monder\*, K. Nandakumar and Karl T. Chuang, Modelling of a H<sub>2</sub>S fuelled Solid Oxide Fuel Cell: Parameter estimation for a hierarchy of models, presented at the *International Symposium on Fuel Cell and Hydrogen Technologies*, Conference of Metallurgists 2005, Calgary, August 2005. (oral presentation)
- C13. Chen, T. and K. Nandakumar\*, A study of bubble/droplet dynamics using computational fluid dynamics, presented at the 7th World Congress in Chemical Engineering, Glasgow, July 10-14. (10 pages)
- C14. H. Chen\*, U. Sundararaj, K. Nandakumar, M. D. Wetzel, and M. T. Pottiger, MELTING PHENOMENA IN POLYMER BLENDING, presented at the ANTEC 2005, Boston, May 1-5, 2005. (7 pages)
- C15. Yun Bai\*, U. Sundararaj, and K. Nandakumar, CFD STUDY OF FLOW PAT-TERN AND HEAT TRANSFER IN MINIATURE MIXERS USING A GENERALIZED NEWTONIAN FLUID, presented at the ANTEC 2005, Boston, May 1-5, 2005. (6 pages)
- C16. H. Chen, B. Lin, K. Nandakumar\*, U. Sundararaj, MODELING OF DROP DEFORMATION AND BREAKUP IN POLYMER BLENDS, presented at the PPS 2004 Americas Regional Meeting, Florianopolis, Brazil, Nov 7-10, 2004. (keynote presentation)
- C17. Yun Bai\*, U. Sundararaj, and K. Nandakumar, Modeling mixing in miniature mixers, presented at the *54th Can. Chem. Eng. Conf.*, Calgary, Oct. 3-6, 2004. (abstract only)
- C18. Hongbing Chen\*, U. Sundararaj, K. Nandakumar, M. D. Wetzel and M. T. Pottiger, Rheological investigation of polymer melt suspensions with polymer beads, presented at the *54th Can. Chem. Eng. Conf.*, Calgary, Oct. 3-6, 2004. (abstract only)
- C19. Yun Bai\*, U. Sundararaj, and K. Nandakumar, Optimizing polymer nanocomposites processing in miniature mixers, presented at the *54th Can. Chem. Eng. Conf.*, Calgary, Oct. 3-6, 2004. (abstract only)
- C20. Hongbing Chen\*, U. Sundararaj and K. Nandakumar, Modeling of drop deformation and breakup in polymer blends, presented at the *54th Can. Chem. Eng. Conf.*, Calgary, Oct. 3-6, 2004. (abstract only)
- C21. Cunkui Huang\*, K. Nandakumar and Daniel Y. Kwok, Non-Equilibrium Injection

Flow in a Nanometer Capillary Channel, presented at the 2004 International Conference on MEMS, NA NO, and Smart Systems, Banff, August 25-27, 2004. (abstract only)

- C22. Hongbing Chen\*, U. Sundararaj, K. Nandakumar, M. D. Wetzel, M. T. Pottiger and John Howe, Rheological investigation of polymer melt suspensions with polymer beads, presented at the *Polymer Processing Society Annual Meeting*, Akron, Ohio, USA, June 20-24, 2004. (abstract only)
- C23. Yun Bai, U. Sundararaj\*, and K. Nandakumar, Modelling the heat transfer and mixing in batch mixers, presented at the *Polymer Processing Society Annual Meeting*, Akron, Ohio, USA, June 20-24, 2004. (abstract only)
- C24. Yun Bai\*, U. Sundararaj, and K. Nandakumar, Miniature Mixers for Polymer Nanocomposites, presented at the *Polymer Processing Society Annual Meeting*, Akron, Ohio, USA, June 20-24, 2004. (Poster Session)
- C25. S. Sankaran\*, C.K. Huang, J.L. Luo, K. Nandakumar, and P. Minev, The Velocity and Concentration Effect on a Pilot Scale Erosion-Corrosion Slurry Line, presented at the Second International Symposium on Environmental Degradation of Materials and Corrosion Control In Metals, J. Luo, M. Elboujdani, D. Shoesmith and P. C. Patnaik Eds, *Proceedings of 42nd Conference of Metallurgists*, MET SOC, Montreal, Quebec, 2003. (pp. 267-275)
- C26. S. Sankaran, J.L. Luo, K. Nandakumar, P. Minev and S. Chiovelli, A Method to Mitigate Erosion-Corrosion in Slurry Pipelines, presented at the *The 42nd Annual Conference of Metallurgists*, Vancouver, British Columbia, Canada, Au-gust 24-27, 2003. (poster session)
- C27. C. Diaz-Goano\*, P. Minev, and K. Nandakumar, Direct simulation of multiphase flow systems: a Lagrange multiplier/fictitious domain method and its parallel implementation, presented at the Second M.I.T. Conference on Computational Fluid and Solid Mechanics, Boston, U.S.A, July 2003. (8 pages)
- C28. T. Chen, C. Diaz-Goano, P.D. Minev\*, and K. Nandakumar, Finite element methods for direct simulation of multiphase flows using Eulerian grids, presented at the *Twelfth International Conference on Finite Element Methods in Flow Problems*, Meijo University, Nagoya, Japan, April 2003. (8 pages)
- C29. Hongbing Chen\*, U. Sundararaj and K. Nandakumar, Modeling of polymer drop deformation and breakup during melting under shear flow using volume-of-fluid method, presented at the *ANTEC 2003*, Nashville, Tennessee, May 4-7, 2003. (5 pages)
- C30. Hongbing Chen\*, Mark D. Wetzel, U. Sundararaj, K. Nandakumar, On-line visualization of PS/PP melting mechanisms in a twin screw extruder, presented at the *ANTE C 2003*, Nashville, Tennessee, May 4-7, 2003. (5 pages)
- C31. J. H. Masliyah\*, Zhenghe Xu,K. Nandakumar, A. Yeung and J. Czarnecki, Emulsion Studies Associated with Bitumen Recovery from Canadian Oil Sands: Part I, presented at the *AIChE Spring meeting*, New Orleans, LA, March 10-14, 2002. (7 pages)
- C32. W. Wang\*, Z. Zhou, K. Nandakumar, Z. Xu and J.H. Masliyah, Effect of surface mobility on the particle sliding along a bubble or a solid sphere, presented at the 52nd Can. *Chem. Eng. Conf.*, Vancouver, Oct. 20-23, 2002. (abstract only)

- C33. A. Murshed\*, K. Nandakumar and B. Huang, Control of chaos in convection loop, presented at the *52nd Can. Chem. Eng. Conf.*, Vancouver, Oct. 20-23, 2002. (abstract only)
- C34. C. Diaz-Goano\*, P. Minev and K. Nandakumar, A fictitious domain method for solving three-dimensional particulate flow, presented at the *52nd Can. Chem. Eng. Conf.*, Vancouver, Oct. 20-23, 2002. (abstract only)
- C35. R. Lopetinsky\*, M. Luthra, J.H. Masliyah and K. Nandakumar, Investigating bitumen liberation with a visualization technique, presented at the *52nd Can. Chem. Eng. Conf.*, Vancouver, Oct. 20-23, 2002. (abstract only)
- C36. G. Gu, K. Nandakumar, Z. Xu and J.H. Masliyah, Single bubble-bitumen attachment in flotation, presented at the *52nd Can. Chem. Eng. Conf.*, Vancouver, Oct. 20-23, 2002. (abstract only)
- C37. D. S. Monder\*, K. Nandakumar, K. T. Chuang, Modelling a H<sub>2</sub>S based solid oxide fuel cell, presented at the *52nd Can. Chem. Eng. Conf.*, Vancouver, Oct. 20-23, 2002. (abstract only)
- C38. P.D. Minev\*, T. Chen and K. Nandakumar, A Finite Element Technique for Multifluid Incompressible Flow using Eulerian Grids, presented at the *Annual meeting of the Canadian Applied and Industrial Mathematics Society*, Calgary, June 8-10, 2002. (abstract only)
- C39. S. Sankaran\*, J.Y. Cai, J.L. Luo, K. Nandakumar and P. Minev, Erosion-Corrosion Behavior of Carbon Steel In Slurry Environment, presented at the 2002 NACE International Northern Area Western Conference, Edmonton, February 18-21, 2002. (absract only)
- C40. J.F. Lu, J.Y. Cai\*, J.L. Luo, K. Nandakumar and P. Minev, Mechanics of Erosion-Corrosion on 44W carbon Steel In a Jet Slurry System, presented at the 2002 *NACE International Northern Area Western Conference*, Edmonton, February 18-21, 2002. (abstract only).
- C41. Chen, H., U. Sundararaj and K. Nandakumar, Modeling heat transfer from a pellet under polymer processing conditions, presented at the 51st Can. Chem. Eng. Conf., Halifax, Oct. 14-17, 2001. (abstract only).
- C42. Sundararaj\*, U, Hongbing Chen, K. Nandakumar, M. D. Wetzel and Chi-Kai Shih, Heat Transfer and Melting during Polymer Blends Extrusion, presented at the 2001 Annual AIChE meeting, Reno, Nevada, Nov. 4-9, 2001. (abstract only).
- C43. Nandakumar\*, K., Lecture1: Taylor-Couette flow, Series on computational fluid dynamics, presented at the *3rd Fluid Dynamics Summer School*, Organized by PIMS, Univ. of Alberta, Edmonton, May-June, 2001. (powerpoint slides)
- C44. Nandakumar\*, K., Lecture2: Bifurcation phenomena, Series on computational fluid dynamics, presented at the *3rd Fluid Dynamics Summer School*, Organized by PIMS, Univ. of Alberta, Edmonton, May-June, 2001. (powerpoint slides)
- C45. Nandakumar\*, K., Lecture3: Continuation algorithms, Series on computational fluid dynamics, presented at the *3rd Fluid Dynamics Summer School*, Organized by PIMS, Univ. of Alberta, Edmonton, May-June, 2001. (powerpoint slides)

- C46. Nandakumar\*, K., Lecture4: Discretization procedures, Series on computational fluid dynamics, presented at the *3rd Fluid Dynamics Summer School*, Organized by PIMS, Univ. of Alberta, Edmonton, May-June, 2001. (power-point slides)
- C47. C. Diaz-Goano, P. Minev\* & K. Nandakumar, A Lagrange multipliers/fictitious domain approach for particulate flow, presented at the *Third International Conference* on Large-Scale Scientific Computations, Sozopol, Bulgaria, June 2001. (SIAM)
- C48. Wen\*, X., Shu, Y., Nandakumar, K, Chuang, K.T., Predicting the Liquid Flow Profiles in Randomly Packed Beds From Computer Simulation, presented at the *50th CSChE Conference*, Montreal, Quebec, Oct. 15-18, 2000. (abstract only)
- C49. Yin\*, F.H., Afacan, A., Nandakumar, K., Chuang K.T., Transport of Tracer in a Gas-Liquid Contactor Packed with Pall Rings, presented at the *50th CSChE Conference*, Montreal, Quebec, Oct. 15-18, 2000. (abstract only)
- C50. Wang, M.H., Bara, B., Hackman, L., Czarnecki, J., Afacan\*, A., Nandakumar, K., Masliyah, J.H., Hydrodynamics in a Gravity Settling Vessel: CFD Modeling with LDA Validation, presented at the *50th CSChE Conference*, Montreal, Quebec, Oct. 15-18, 2000. (abstract only)
- C51. D. Sharp\*, A. Afacan, K. Nandakumar, Numerical Simulation of a Bubble Column, presented at the *49th CSChE Conference*, Saskatoon, Saskatchewan, Oct. 3-6, 1999. (abstract only)
- C52. F.H. Yin\*, M.K. Song, K.T. Chuang and K. Nandakumar, The Numerical Simulation on Hydrodynamics and Dispersion in the Randomly Packed Beds, presented at the *48th Canadian Society for Chemical Engineering Conference*, London, Ontario, Oct. 4-7, 1998. (abstract only)
- C53. M. Song\*, F.H. Yin, K. Nandakumar, K.T. Chuang, Rigorous Modelling of CO2 Absorption with Chemical Reaction in Packed Columns, presented at the *48th Canadian Society for Chemical Engineering Conference, London,* Ontario, Oct. 4-7, 1998. (abstract only)
- C54. M. Song\*, K. Nandakumar, K.T. Chuang, Structural Properties of Packings of Unequal-Sized Spheres: A Monte Carlo Simulation, presented at the 48th Canadian Society for Chemical Engineering Conference, London, Ontario, Oct. 4-7, 1998. (abstract only)
- C55. K. Nandakumar\*, CFD'98 Benchmark Challenge, presented at the *Sixth annual conference of the CFD society of Canada*, Quebec City, June 7-9, 1998. (abstract only)
- C56. Basu, S.\*, K. Nandakumar and J.H. Masliyah, Bitumen contact angle at different pH conditions on microscope glass slide and oil sand grain, presented at the 47th Canadian Society for Chemical Engineering Conference, Edmonton, Alberta, Oct. 5-8, 1997. (abstract only)
- C57. Basu, S.\*, K. Nandakumar and J.H. Masliyah, A model for detachment of a partially wetting drop from a solid surface by shear flow, presented at the *47th Canadian Society for Chemical Engineering Conference*, Edmonton, Alberta, Oct. 5-8, 1997. (abstract only)
- C58. Mees, PAJ.\*, K. Nandakumar and J.H. Masliyah, Symmetry and stability of the dean

problem, presented at the 47th Canadian Society for Chemical Engineering Conference, Edmonton, Alberta, Oct. 5-8, 1997. (abstract only)

- C59. Song, M.\*, F. H. Yin, K. Nandakumar and K. T. Chuang, Validation of the stochastic splitting model in random packed columns, presented at the *47th Canadian Society for Chemical Engineering Conference*, Edmonton, Alberta, Oct. 5-8, 1997. (abstract only)
- C60. Yin, F. H.\*, M. Song, K. Nandakumar and K. T. Chuang, A three dimensional simulation of two-phase flow in random packed columns, presented at the 47th Canadian Society for Chemical Engineering Conference, Edmonton, Alberta, Oct. 5-8, 1997. (abstract only)
- C61. Mees, P.A.J.\*, K.Nandakumar and J.H.Masliyah, Steady spatial oscillations in a curved duct of square cross-section, presented at the *46th Canadian Society for Chemical Engineering conference*, Kingston, Ontario, Sept. 29-Oct. 2, 1996. (abstract only)
- C62. Basu, S.\*, K. Nandakumar and J.H.Masliyah, A Study of oil displacement on model surfaces, presented at the *46th Canadian Society for Chemical Engineering conference*, Kingston, Ontario, Sept. 29-Oct. 2, 1996. (abstract only)
- C63. Mehta, B. M., K. T. Chuang and K. Nandakumar\*, Hyrodynamic simulation of flow in a distillation tray, presented at the 46th Canadian Society for Chemical Engineering conference, Kingston, Ontario, Sept. 29-Oct. 2, 1996. (abstract only)
- C64. Afacan, A., D.Sharpe and K. Nandakumar\*, Modelling the dynamics of bubble column, presented at the 46th Canadian Society for Chemical Engineering conference, Kingston, Ontario, Sept. 29-Oct. 2, 1996. (abstract only)
- C65. Minhas, H., K. Nandkaumar, S. M. Kresta, L. Hackman and B. Bara, Numerical analysis of bidisperse sedimentation in rectangular channels, presented at the Int. Symposium on two-phase flow modelling and experimentation, Rome, Italy, October 9-11, 1995. (abstract only)
- C66. Mehta, B. M., K. T. Chuang and K. Nandakumar, Modelling of sieve and dual flow trays using computational fluid dynamics, presented at the 45th Canadian Society for Chemical Engineering conference, Quebec City, Quebec, Oct. 15-18, 1995. (abstract only)
- C67. Lakshminarayanan, S., S. L. Shah and K. Nandakumar, Statistical model based monitoring and fault detection of event driven operations, presented at the 45th Canadian Society for Chemical Engineering conference, Quebec City, Quebec, Oct. 15-18, 1995. (abstract only)
- C68. Lakshminarayanan, S., Ravindra D. Gudi, Sirish L. Shah and K. Nandakumar, On-line Monitoring of a Fed-batch Fermentor using Multirate-Multiblock-Multiway Projection to Latent Structures, presented at the Session on Batch Process Modeling, Monitoring & Control at the AIChE Annual Meeting, Miami, Florida, November 1995. (abstract only)
- C69. Ravi K. Sharma and K. Nandakumar, Secondary flow in a rotating circular pipe, presented at the 45th Annual meeting of the Division of Fluid Dynamics of the American Physical Society, Atlanta, Georgia, Nov. 21-24, 1994. (abstract only)
- C70. Mees, P.A.J., K. Nandakumar and J.H. Masliyah, Travelling wave in a curved duct., presented at the 45th Annual meeting of the Division of Fluid Dynamics of the American Physical Society, Atlanta, Georgia, Nov. 21-24, 1994. (abstract only)

- C71. Lakshminarayanan, S., S. L. Shah and K. Nandakumar, Modelling a class of nonlinear MIMO systems using multivariate statistical tools, presented at the AIChE Annual meeting, San Francisco, Nov. 14-19, 1994. (4 pages)
- C72.Lakshminarayanan, S., S. L. Shah and K. Nandakumar, MIMO system identification using multivariate techniques, presented at the 44th Canadian Society for Chemical Engineering conference, Calgary, Alta, Oct. 6-9, 1994. (abstract only)
- C73. Kevin C. Dorma and K. Nandakumar, Multiphase continuum modelling: Numerical simulation of bidisperse sedimentation in two dimensions, presented at the 44th Canadian Society for Chemical Engineering conference, Calgary, Alta, Oct. 6-9, 1994. (abstract only)
- C74. Kevin C. Dorma and K. Nandakumar, Multiphase continuum modelling: Numerical simulation of sedimentation in two dimensions, presented at the *11th Canadian Symposium on Fluid Dynamics*, Edmonton, Alta, Jun 10-12, 1994. (abstract only)
- C75. Mees, P.A.J.\* J. H. Masliyah and K. Nandakumar, New transitions of steady and unsteady flow in a curved square duct, presented at the *11th Canadian Symposium on Fluid Dynamics*, Edmonton, Alta, Jun 10-12, 1994. (abstract only)
- C76. Selmi, M., K. Nandakumar and W. H. Finlay, A bifurcation study of viscous flow through a rotating, curved duct., presented at the 46th Annual meeting of the Division of Fluid Dynamics of the American Physical Society, Albuquerque, New Mexico, Nov. 21-23, 1993. (abstract only)
- C77. Mees\*, P.A.J., K. Nandakumar and J.H. Masliyah, Flow transitions of the Dean problem in a square duct, presented at the *NATO Advanced Research Workshop on Spatio- Temporal Properties of Centrifugal Instabilities*, Nice, France, March 29-31, 1993. (5 pages)
- C78. Mees, P.A.J. \*, K. Nandakumar and J.H. Masliyah, Travelling wave in a curved duct., presented at the 45th Annual meeting of the Division of Fluid Dynamics of the American Physical Society, Tallahassee, Florida, Nov. 22-24, 1992. (abstract only)
- C79. Mees, P.A.J.\*, J.H. Masliyah and K. Nandakumar, Travelling wave experiments in curved duct flow, presented at the *13th Annual conference of the Canadian Applied Mathematics Society*, Edmonton, Alberta, June 15-18, 1992. (abstract only)
- C80. Ryland, D.K.\* and K. Nandakumar, Bifurcation phenomena in tilted porous layers with uniform internal heating, presented at the *7th International conference on Numerical Methods in Laminar and Turbulent Flow*, Stanford, Ca., July 15-19, 1991. (11 pages)
- C81. Ryland, D.K.\* and K. Nandakumar, Bifurcation phenomena in a Hele-Shaw model, presented at the *41st Canadian Society for Chemical Engineering conference*, Vancouver, BC, Oct. 6-9, 1991. (abstract only)
- C82. K. Nandakumar\*, Bifurcation phenomena in the Dean and Morton problems, presented at the *41st Canadian Society for Chemical Engineering conference*, Vancouver, BC, Oct. 6-9, 1991. (abstract only)
- C83. Bara, B., K. Nandakumar\* and J.H. Masliyah, Experimental and numerical investigation of the Dean problem, presented at the 44th Annual meeting of the Division of Fluid Dynamics of the American Physical Society, Scottsdale, Arizona,

Nov. 24-26, 1991. (abstract only)

- C84. Mees, P.A.J.\*, K. Nandakumar and J.H. Masliyah, Experimental travelling wave in a curved duct., presented at the 44th Annual meeting of the Division of Fluid Dynamics of the American Physical Society, Scottsdale, Arizona, Nov. 24-26, 1991. (abstract only)
- C85. Chen, H., W.H. Finlay, K. Nandakumar and H.C.Ku, A pseudospectral matrix method for solution of the 3-D Navier-Stokes equations in a rectangular channel with rotation, presented at the 43rd Annual meeting of the Division of Fluid Dynamics, Ithaca, New York, Nov. 18-20, 1990. (abstract only)
- C86. Islam, M. R. and K. Nandakumar\*, Evolution of oscillatory and chaotic flows in inclined porous ducts with internal heat sources, presented at the *6th Int. Conf. on Num. Methods in Laminar and Turbulent Flow,* Swansea, U.K., July 11-15, 1989. (10 pages)
- C87. Hayes, R. E. and K. Nandakumar, Numerical study of flow and heat transfer in a tee branch, presented at the *39th Canadian Society for Chemical Engineering Conference*, Hamilton, Ontario, Oct. 1-4, 1989. (abstract only)
- C88. Islam, M. R., A. Chakma and K. Nandakumar, Cellular pattern evolution in inclined porous media with internal heat generation, presented at the *Proc. Joint AIChEJ-ASME Heat Transfer Symposium*, Philadelphia, Aug.6-9, 1989. (6 pages)
- C89. Ravi Sankar, S., and K. Nandakumar, Mixed convection heat transfer in the entrance region of horizontal ducts, presented at the *4th Asian Congress of Fluid Mechanics*, Hong Kong, Aug. 21-25, 1989. (4 pages)
- C90. Islam M. R. and K. Nandakumar, Cellular pattern evolution in a porous duct with internal heat generation, presented at the *38th Canadian Society for Chemical Engineering Conference*, Edmonton, Oct. 2-5, 1988. (abstract only)
- C91. Bondy, R. W., A. E. Mather and K. Nandakumar, Distillation simulation using physical homotopies, presented at the *38th Canadian Society for Chemical Engineering Conference*, Edmonton, Oct. 2-5, 1988. (abstract only)
- C92. Nasr-El-Din, H., J. H. Masliyah, K. Nandakumar and H.-S. Law, Continuous separation of bidisperse suspensions: Part I. Vertical column, presented at the *38th Canadian Society for Chemical Engineering Conference*, Edmonton, Oct. 2-5, 1988. (abstract only)
- C93. Nasr-El-Din H., J. H. Masliyah and K. Nandakumar, Continuous separation of bidisperse suspensions: Part II. Inclined column, presented at the *38th Canadian Society for Chemical Engineering Conference*, Edmonton, Oct. 2-5, 1988. (abstract only)
- C94. Ravi Sankar, S., K. Nandakumar and J. H. Masliyah, Development Oscillatory flows in coiled ducts, presented at the *CANCAM* 87, Edmonton, May 31-June 4, 1987. (2 pages)
- C95. Nandakumar, K., Weinitschke, H. J.,and S. Ravi Sankar, Calculation of limit and bifurcation points for mixed convection in a porous duct, presented at the *ASME Winter Annual meeting*, Boston, Dec. 1987. (6 pages)

- C96. Hin-Sum Law, Jacob H. Masliyah, Robert S. MacTaggart and K. Nandakumar, Settling of bidisperse suspensions in inclined parallel plates, presented at the *36th Canadian Society for Chemical Engineering Conference*, Sarnia, October 5-8, 1986. (abstract only)
- C97. Hin-Sum Law, Jacob H. Masliyah, Robert S. MacTaggart and K. Nandakumar, Settling of bidisperse suspensions of light and heavy particle species, presented at the *4th Miami International Symposium on Multi-Phase Transport & Particulate Phenomena*, Miami Beach, Florida, December 15-17, 1986. (9 pages)
- C98. Fung, L., K. Nandakumar and J. H. Masliyah, Profuse Multiplicity in Mixed Convection Flow in Ducts, 85-WA/HT-12, presented at the *106th ASME Winter Annual meeting*, Miami Beach, November 1985. (9pages)
- C99. Islam, R. M. and K. Nandakumar, Mixed Convection Flow in a Fluid Saturated Porous Media in the non-Darcy Regime, presented at the *Fourth International Conference on Numerical Methods in Laminar and Turbulent Flow*, Swansea, July 9-12, 1985. (pp937-947)
- C100. Walgama, S. and K. Nandakumar, Flow Bifurcation in Curved Ducts: Effect of Power Law Index and Aspect Ratio, presented at the *35th Canadian Society for Chemical Engineering Conference*, Calgary, October, 1985. (11 pages)
- C101. MacTaggart, R. S., J. H. Masliyah, Hin-Sum Law and K. Nandakumar, Suspension Separation using an Inclined Plate Settler, presented at the 35th Canadian Society for Chemical Engineering Conference, Calgary, October, 1985. (11 pages)
- C102. Hin-Sum Law, J. H. Masliyah and K. Nandakumar, Ablation of Ice-Solid Mixtures, presented at the *35th Canadian Society for Chemical Engineering Conference*, Calgary, October, 1985. (11pages)
- C103. Nandakumar, K. and J. H. Masliyah, A Catastrophe Theory Interpretation of Certain Mixed Convection Flow Problems, presented at the 77th Annual AIChE meeting, San Francisco, November 1984. (abstract only)
- C104. Tomcej, R. A., and K. Nandakumar, Multiple Solutions in Mixed Convection Flow of a Power Law Fluid in Horizontal Ducts, presented at the *34th Canadian Society for Chemical Engineering Conference*, Halifax, October 1984. (abstract only)
- C105. Masliyah, J. H., K. Nandakumar and E. Obreiter, Numerical Solution of Flow Under Sluice Gates Using Boundary-Fitted Coordinates, presented at the 34<sup>th</sup> Canadian Society for Chemical Engineering Conference, Halifax, October 1984. (abstract only)
- C106. Nandakumar, K., J. H. Masliyah and Hin Sum Law, Multiple Steady States and Hysteresis in Mixed Convection Flow in Horizontal Square Tubes, presented at the *Second International Conference on Numerical Methods for Nonlinear Problems*, Barcelona, Spain, April 1984. (11 pages)
- C107. Nandakumar, K. and J. H. Masliyah, Effect of Finite Pitch on Laminar Flow in a Coiled Tube, presented at the *33rd Canadian Society for Chemical Engineering Conference*, Toronto, Oct. 1983. (abstract only)
- C108. Nandakumar, K. and J. H. Masliyah, Laminar Flow in Curved Moon Shaped Ducts, presented at the Second International Conference on Numerical Methods in Laminar

and Turbulent Flow, Venice, Italy, July 1981. (11pages)

- C109. Nandakumar, K. and J. H. Masliyah, Fluid Flow and Heat Transfer in Twisted Rectangular Tubes, presented at the *Second World Congress of Chemical Engineering*, Montreal, October 1981. (abstract only)
- C110. Nandakumar, K., F. D. Otto and R. P. Andres, Minimum Reflux Calculations in Complex Columns, presented at the 74th Annual Meeting of AIChE, New Orleans, Nov. 1981. (abstract only)
- C111. Nandakumar, K. and J. H. Masliyah, Steady Laminar Flow Through Twisted Pipes: Fluid Flow and Heat Transfer in Rectangular Tubes, presented at the 74th Annual Meeting of AIChE, New Orleans, Nov.1981. (abstract only)
- C112. Nandakumar, K. and R. P. Andres, Minimum Reflux Distillation Calculations, presented at the *AIChE 88th National Meeting*, Philadelphia, June 8-12, 1980. (abstract only)
- C113. Masliyah, J. H., Nandakumar, K. and M. Polikar, Experimental and Numerical Study of Drag on an Isolated Permeable Sphere, presented at the *National Heat Transfer Conference*, Edmonton, October 19-22, 1980. (abstract only)
- C114. Nandakumar, K. and R. P. Andres, A New Decomposition Method for Dynamic Simulation of Large Scale Systems, presented at the *1978 Summer Computer Simulation Conference*, Ca., 1978. (6 pages)

#### Manuscripts under review/preparation

- M1. Ekambara Kalekudithi, Sean R. Sanders, K. Nandakumar, and Jacob H. Masliyah, CFD simulation of bubbly two-phase flow in horizontal pipes, communicated to *Chem Eng Sci.*
- M2. Ekambara Kalekudithi, Sean R. Sanders, K. Nandakumar, and Jacob H. Masliyah, CFD simulation of gas-liquid bubbly flow in horizontal pipes: Influence of bubble coalescence and break-up, communicated to *Int J Multiphase Flow*
- M3. Yarub Al-Jahmany and K. Nandakumar, Experimental and numerical investigation of a laminar flow over two tandem square cylinders, Communicated to Int J Comp Fluid Dynamics.
- M4. **AKM M. Murshed**, Biao Huang ,K. Nandakumar, Control of planer solid oxide fuel cell system, to be communicated.
- M5. **Cunkui Huang**, Phillip Y. K. Choi, K. Nandakumar and Larry W. Kostiuk, Study of liquid argon flow driven by a pressure gradient in a finite cylindrical nanopore by a novel non-equilibrium molecular dynamics method. (communicated to *Phys Review E*).