

Yongpan Cheng(Ph.D)

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Education

- Mar. 2011-Present **Research Fellow**
Particle Technology Lab
Department of Chemical and Biomolecular Engineering
National University of Singapore
Supervisor: Prof. **C. H. Wang**
- Febr. 2008- Febr. 2010 **Research Fellow**
Laboratory of Fluid Mechanics
Department of Mechanical Engineering
National University of Singapore
Supervisor: A.P. **C.J. Teo** and Prof. **B.C. Khoo**
- Aug.2004-Febr. 2008 **Ph.D**
Laboratory of Fluid Mechanics
Department of Mechanical Engineering
National University of Singapore
Supervisor: A.P. **T.S. Lee** and A.P. **H.T. Low**
- Sept. 2001-Jun.2004 **Master**
Center of Thermal & Fluid Science
School of Energy &Power Engineering
Xian Jiaotong University
Major: **Engineering Thermalphysics**
Supervisor: Prof. **Wen-quan Tao**
(Academician of Chinese Academy in Science)
- Sept.1997- Jul. 2001 Bachelor
School of Energy & Power Engineering
Xian Jiaotong University
Major: **Refrigerating and Cryogenic Engineering**

Research Interest and skills

Multi-phase Flow and Heat Transfer
Electrostatics Generation and Transport
Electrical Capacitance Tomography
Computational Fluid Dynamics and Heat Transfer
Micro- and Nano-fluidics and Heat Transfer
Design of efficient heat exchanger and electronic cooling
Professional in FLUENT, ANSYS, GAMBIT, COMSOL,EDEM etc.softwares
Professional in FORTRAN, C++ Languages

Major Research Experience

- Dec. 2001-May 2004
Designed the air intercooler for Hangzhou Oxygen Science and Technology Ltd, China, the efficient slit fin-and-tube heat exchanger has been widely manufactured.
- July 2005-Jan. 2008
(1) Proposed an efficient and robust SIMPLE-like algorithm for incompressible flow, which has been successfully extended to simulate the complex flow in heat exchangers
(2) Designed an effective electronic cooling configuration.
- Febr. 2008-Febr. 2010
(1) Numerically and experimentally studied superhydrophobic surfaces, which can reduce the required pressure drop in micro-channels.
(2) Numerically and experimentally studied the flow and heat transfer in micro-wavy channels.
- March 2010- Present
(1) Experimentally and numerically studying the hydrodynamics, electrostatics and heat transfer in triple-bed circulating fluidized bed.
(2) Studying the theory and fabrication of electrical capacitance tomography, and using it to image the multi-phase flow in the circulating fluidized bed.

Selected Publications

1. Tao W.Q., He Y. L., Qu Z.G. and Cheng Y.P. Application of the field synergy principle in developing new type heat transfer enhanced surface. *J. Enhanced Heat Transfer*, 11(4):438-451, 2004.
2. Cheng Y. P., Qu Z.G, Tao W.Q. and He Y.L. Numerical design of efficient slotted fin surface based on the field synergy principle. *Numerical Heat Transfer, Part A*, 45: 517-538,2004.
3. Cheng Y. P., Lee T.S. and Low H.T., Numerical analysis of mixed convection in three-dimensional rectangular channel with flush-mounted heat sources based on field synergy principle. *International Journal for Numerical Methods in Fluids*, vol.52, pp. 987-1003, 2006.
4. Cheng Y. P., Lee T. S., Low H. T. and Tao W. Q., An efficient and robust numerical scheme for SIMPLER algorithm on non-orthogonal curvilinear coordinates, CLEARER, *Numerical Heat Transfer, Part B*, vol.51(5), pp. 433-461, 2007.
5. Cheng Y. P., Lee T. S., Low H. T. and Tao W.Q., Improvement of SIMPLER algorithm for incompressible flow on collocated grid system. *Numerical Heat Transfer, Part B*, vol.51(5), pp. 463-486, 2007.
6. Lee T.S., Cheng Y. P. and Low H. T., Improvement of SIMPLER algorithm for incompressible flow on staggered grid system. *International Journal of Modern Physics C*, vol.18(7), pp.1149-1155, 2007.
7. Tao W.Q., Cheng Y. P. and Lee T.S., 3D numerical simulation on fluid flow and heat transfer characteristics in multistage heat exchanger with slit fins, *Heat and Mass Transfer*, vol.44, pp.125-136, 2007.
8. Tao W.Q., Cheng Y. P. and Lee T.S., The influence of strip location on the pressure drop and heat transfer performance of slotted fin, *Numerical Heat Transfer, Part A*, vol.52, pp.463-480, 2007.
9. Cheng Y. P., Lee T. S. and Low H. T., Numerical analysis of conjugate heat transfer in electronic cooling based on field synergy principle, *Applied Thermal Engineering*, 28: 1826-1833, 2008.
10. Cheng Y. P., Lee T. S. and Low H. T., Numerical analysis of periodically developed fluid flow and heat transfer characteristics in the triangular wavy fin-and-tube heat exchanger based on field synergy principle. *Numerical Heat Transfer*, vol.53(8), pp.821-842, 2008.
11. Cheng Y. P., Lee T. S., Low H. T. and Sui Y., Implementation of CLEARER algorithm on three-dimensional non-orthogonal curvilinear coordinates and its application. *Numerical Heat Transfer, Part B*, 54: 62-83,2008.

12. Sui Y., Chew Y. T., Roy P., Cheng Y. P. and Low H. T. Dynamic motion of red blood cells in simple shear flow. *Physics of Fluids*, 20, 112106, 2008.
13. Cheng Y. P., Lee T. S. and Low H. T., Numerical prediction of periodically developed fluid flow and heat transfer characteristics in the sinusoid wavy fin-and-tube heat exchanger. *International Journal of Numerical Methods for Heat and Fluid Flow*. 19(6): 728-744, 2009
14. Cheng Y. P., Lee T. S., Sui Y. and Wang L. P. Numerical simulation of 2D lid-driven cavity flow with CLEARER algorithm on extremely highly skewed grids at high Reynolds numbers.
International Journal for Numerical Methods in Fluids, in press.
15. Cheng Y. P., Teo C. J. and Khoo B.C. Microchannels flows with superhydrophobic surfaces: effects of Reynolds number and pattern width to channel height ratio. *Physics of Fluids*, 21: 122004, 2009.
16. Guan G. Q., Fushimi C., Ishizuka M., Nakamura Y., Tsutsumi A., Matsuda S., Suzuki Y., Hatano H., Cheng Y.P., Lim W.C.E, Wang C. H.. Flow behaviors in the downer of a large-scale triple-bed combined circulating fluidized system with high solids mass fluxes, *Chemical Engineering Science*, accepted.