

## Professor Joseph Hun Wei Lee

**President and Chair Professor  
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### Academic Qualification

**Ph.D. in** Civil Engineering, Massachusetts Institute of Technology, USA

**MSc in** Civil Engineering, Massachusetts Institute of Technology, USA

**BSc in** Civil Engineering, Massachusetts Institute of Technology, USA

### Research & Teaching Area

Environmental hydraulics/fluid mechanics; water quality modeling and real time forecasting; urban flood control; artificial intelligence and hydro-environment engineering, science policy.

### Recent Events/Links

- (i) Croucher Advanced Study Institute on "Global water security: integrated modeling and adaptive management", 8-11 January, 2019 ([asi2019.ust.hk/](http://asi2019.ust.hk/))
- (ii) Symposium on Hydro-environment Research for Smart Cities, 12-14, December 2017 ([hydrosym2017.ust.hk/](http://hydrosym2017.ust.hk/))
- (iii) International Association for Hydro-environment Engineering and Research (IAHR) ([www.iahr.org](http://www.iahr.org))
- (iv) Report on Policy Study on the Integrative Development of Innovation and Technology in the Guangdong-Hong Kong-Macao Greater Bay Area ([ebookshelf.ust.hk/flippingbook/G18653/mobile/index.htm](http://ebookshelf.ust.hk/flippingbook/G18653/mobile/index.htm))

### Awards & Honours/Appointments (Selected)

#### Awards & Honours

- ✧ Fellow, Royal Academy of Engineering, United Kingdom (2008);
- ✧ Fellow, Hong Kong Academy of Engineering Sciences (2002);

- ✧ President, International Association for Hydro-environmental Engineering and Research (IAHR) (2019-);
- ✧ Da Yu Hydro-Science and Engineering Award (Second Class), “Hong Kong Happy Valley Underground Smart Flood Control System”, Chinese Hydraulic Engineering Society (2018).
- ✧ Innovation Award (First Prize, Sustainability), “Supercritical Vortex Intakes for Urban Stormwater Management”, Hong Kong Construction Industry Council (CIC) (2017);
- ✧ Honorary Member, International Association for Hydro-Environment Engineering and Research (IAHR) (2015);
- ✧ Karl Emil Hilgard Hydraulic Prize of the American Society of Civil Engineers (ASCE) (2013);
- ✧ China State Scientific and Technological Progress Award (Second class) (2010) (Principal Investigator);
- ✧ Hunter Rouse Hydraulic Engineering Award, American Society of Civil Engineers (2009);
- ✧ Innovation Award for Construction Industry, “Underground Flood Alleviation Scheme”, Hong Kong Institution of Engineers (2002);
- ✧ Croucher Foundation Senior Research Fellowship Award (1998);
- ✧ Erskine Fellowship, University of Canterbury, New Zealand (1998);
- ✧ Alexander von Humboldt Research Fellow, University of Karlsruhe, Germany (1992-1993);
- ✧ Commonwealth Academic Staff Fellowship, Imperial College of Science and Technology, United Kingdom (1985-1986).

### **Appointments**

- ✧ Honorary Professor, Nankai University (2010-);
- ✧ Honorary Professor, Hohai University (2019-);
- ✧ Chief Editor, Journal of Hydro-environment Research, Elsevier (2007-2019);
- ✧ Associate Editor, Journal of Hydraulic Engineering, ASCE (1997-);
- ✧ Associate Editor, Environmental Fluid Mechanics, Springer (2011-2020);
- ✧ Chairman, Hong Kong Research Grants Council (2020-March 2021);
- ✧ Chairman, Assessment Panel of the Hong Kong Public Policy Research Scheme, Hong Kong SAR Government (2017-);
- ✧ Member, Aviation Development and Three-runway System Advisory Committee, Hong Kong SAR Government (2015-2021).

### **Working Experience**

- President, Macau University of Science and Technology (MUST) (Jan 2021 -);
- Senior Member, Jockey Club Institute for Advanced Study, Hong Kong University of Science and Technology (HKUST) (July 2020-);
- Senior Advisor to the President and Visiting Professor, Department of Civil & Environmental Engineering, HKUST (July 2018-2020);
- Elman Family Professor of Engineering & Public Policy, HKUST (2017-2018);
- Vice-President for Research & Graduate Studies and Chair Professor, HKUST (2010-2016);
- Pro-Vice-Chancellor and Chair Professor, The University of Hong Kong (2004-Oct.2010);
- Dean of Engineering, The University of Hong Kong (2000-2003);
- Redmond Chair of Civil Engineering, The University of Hong Kong (1996-2010);
- Senior Lecturer; Reader (1991) and Chair Professor (1995), Department of Civil and Structural Engineering, The University of Hong Kong (1987-1996);
- Lecturer, Department of Civil Engineering, The University of Hong Kong (1980-1987);

- Assistant Professor, Department of Civil Engineering, University of Delaware, Newark, Delaware, USA (1977-1980)

## Academic Publications (selected)

### Books/Edited Volumes

1. Wang, Z.Y., Lee, J.H.W. and Melching, C.S., *River Dynamics and Integrated River Management*, Springer, 2013, 847 pp. (ISBN 978-3-642-25651-6).
2. Fang, H.H.P. and Lee, J.H.W. (ed.), Sustainable and Safe Water Supplies, *Water Science and Technology: Water Supply*, Vol.7, No.2, 2007, 220 pp.
3. Lee, J.H.W. and Lam, K.M. (ed.), *Environmental Hydraulics and Sustainable Water Management*, Taylor and Francis, London, 2005, 2315 pp. (ISBN 04-1536-546-5).
4. Lee, J.H.W. and Chu, V.H., *Turbulent Jets and Plumes – a Lagrangian Approach*, Springer/Kluwer, 2003, 390 pp. (ISBN 1-4020-7520-0).
5. Lee, J.H.W., Jayawardena, A.W. and Wang, Z.Y. (ed.), *Proceedings of the Second International Symposium on Environmental Hydraulics, Hong Kong*, December 16-18, 1998, A.A. Balkema, Netherlands, 1999, 976 pp. (ISBN 90-5809-035-3).
6. Lee, J.H.W. and Cheung, Y.K. (ed.), *Proceedings of the International Symposium on Environmental Hydraulics, Hong Kong*, December 16-18, 1991, A.A. Balkema, Netherlands, 1991, Vol. 1 and 2, 1659 pp. (ISBN 90-5410-038-9).

### Journal Papers

1. Guo, J. H., Ma, Y. Y. and Lee, J.H.W.\* , “Real-time automated identification of algal bloom species for fisheries management in subtropical coastal waters”, *Journal of Hydro-environment Research*, Vol.36, 2021, pp. 1-32 (<https://doi.org/10.1016/j.jher.2021.03.002>).
2. Guo, J.H., Dong, Y. and Lee, J.H.W.\* , “A real time data driven algal bloom risk forecast system for mariculture management”, *Marine Pollution Bulletin*, Vol. 161, 2020, 111731.
3. Chan, S.N., Chang, L., Choi, K.W., Lee, J.H.W.\* , Fawell, J.K. and Kwok, K.Y.T., “Unraveling the causes of excess lead in drinking water supply systems of densely populated high-rise buildings in Hong Kong” , *Environmental Science and Technology*, Vol.54, No. 22, 2020, pp. 14322-14333.
4. Cheng, K.H., Chan, S.N. and Lee, J.H.W.\* , “Remote sensing of coastal algal blooms using Unmanned Aerial Vehicles”, *Marine Pollution Bulletin*, Vol. 152, March 2020, 110889-14.
5. Yang, A.J.K., Chan, S.N., Lee, J.H.W.\* and Zhang, X, “Integral model of a reacting chlorine jet in ammonia nitrogen and treated primary effluent”, *Journal of Hydro-environment Research*, Vol. 27, 2019, pp. 50-64.
6. Arega, F.\* , Lam, M.Y. and Lee, J.H.W., “Supercritical stormwater flow interception through bottom rack with transverse barrier”, *Journal of Irrigation and Drainage Engineering*, ASCE, Vol. 145, No. 4, 2019, 05019002-13.

7. Li, W., Zhang, X.\* , Li, X. and Lee, J.H.W., "Mystery of the high chlorine consumption in disinfecting a chemically enhanced primary saline sewage", *Water Research*, Vol. 145, No. 15, November 2018, pp. 181-189.
8. Chan, S.N., Wong, K.C. and Lee, J.H.W.\* , "Hydraulics of air-water flow in a supercritical bottom rack intake", *Journal of Hydro-Environment Research*, Vol. 21, 2018, 60-75.
9. Chan, S.N., Qiao, Q.S. and Lee, J.H.W.\* , "On the three-dimensional flow of a stable tangential vortex intake", *Journal of Hydro-Environment Research*, Vol. 21, 2018, 29-42.
10. Xu, E.G.\* , Chan, S.N., Choi, K.W., Lee, J.H.W. and Leung, K.M.Y., "Tracking major endocrine disruptors in coastal waters using an integrative approach coupling field-based study and hydrodynamic modelling", *Environmental Pollution*, Vol. 233, 2018, pp. 387-394.
11. Chan, S.N., Cong, J., and Lee, J.H.W.\* , "3D numerical modeling of geyser formation by release of entrapped air from horizontal pipe into vertical shaft", *Journal of Hydraulic Engineering*, ASCE, Vol. 144, No. 3, 2018, 04017071-16.
12. Qiao, Q.S., Choi, K.W., Chan, S.N. and Lee, J.H.W.\* , "Internal hydraulics of a chlorine jet diffuser", *Journal of Hydraulic Engineering*, ASCE, Vol. 143, No. 12, 2017, 06017022-7.
13. Chan, S.N., Qiao, Q.S., Lee, J.H.W.\* , Choi, K.W. and Huang, J.C., "Modeling of mixing and rapid chlorine demand in sewage disinfection with dense chlorine jets", *Journal of Environmental Engineering*, ASCE, Vol. 143, No. 11, 2017, 04017074-12.
14. Lee, J.H.W.\* , Qiao, Q.S., Chan, S.N., Choi, K.W. and Huang, J.C., "Field experiments of chlorine demand in disinfection of treated primary effluent", *Journal of Environmental Engineering*, ASCE, Vol. 143, No. 11, 2017, 4017073-16.
15. Cong, J., Chan, S.N., and Lee, J.H.W.\* , "Geyser formation by release of entrapped air from horizontal pipe into vertical shaft", *Journal of Hydraulic Engineering*, ASCE, Vol. 143, No. 9, 2017, 04017039-13.
16. Lee, J.O.O., Choi, K.W., Chu, J.C.W. and Lee, J.H.W.\* , "Country Paper 9: A science-based management approach for sustainable mariculture in Hong Kong SAR", In W. Miao & K. K. Lal (Eds.), *Sustainable intensification of aquaculture in the Asia-Pacific region. Documentation of successful practices*, Bangkok, Thailand: FAO. 2016, 103-109.
17. Choi, K.W., Lai, C.C.K. and Lee, J.H.W.\* , "Mixing in the intermediate field of dense jets in cross currents", *Journal of Hydraulic Engineering*, ASCE, Vol. 142, No. 1, 2016, 04015041-17.
18. Chan, Y.M., Thoe, W. and Lee, J.H.W.\* , "Field and laboratory studies of Escherichia coli decay rate in subtropical coastal water", *Journal of Hydro-environment Research*, Vol. 9, No. 1, 2015, 1-14.
19. Lee, J.H.W.\* , Wong, K.T.M., Choi, K.W. and Arega, F., "Post-operation performance of the Tai Hang Tung Storage Scheme in storm events: 2D hydraulic analysis and field verification", *Journal of Hydraulic Engineering*, Vol. 140, No. 4, 2014, 05014001.
20. Chan, S.N., Lee, K.W.Y. and Lee, J.H.W.\* , "Numerical modelling of horizontal sediment-laden jets", *Environmental Fluid Mechanics*, Vol. 14, No. 1, 2014, 173-200.
21. Thoe, W. and Lee, J.H.W.\* , "Daily forecasting of Hong Kong beach water quality by Multiple Linear Regression (MLR) models", *Journal of Environmental Engineering*, ASCE, Vol. 140, No. 2, 2014, 04013007-13.

22. Chan, S.N., Thoe, W. and Lee, J.H.W.\*, "Real-time forecasting of Hong Kong beach water quality by 3D deterministic model", *Water Research*, Vol. 47, No. 4, 2013, 1631-1647.
23. Wang, Z.Y.\*, Lee, J.H.W. and Xu, M.Z., "Eco-hydraulics and eco-sedimentation studies in China", *Journal of Hydraulic Research*, Vol. 51, No. 1, 2013, 19-32.
24. Lai, A.C.H. and Lee, J.H.W.\*, "Dynamic interaction of multiple buoyant jets", *Journal of Fluid Mechanics*, Vol. 708, 2012, 539-575.
25. Lai, C.C.K. and Lee, J.H.W.\*, "Mixing of inclined dense jets in stationary ambient", *Journal of Hydro-environment Research*, Vol. 6, No. 1, 2012, 9-28.
26. Lee, J.H.W.\*, "Mixing of multiple buoyant jets", *Journal of Hydraulic Engineering*, ASCE, Vol. 138, No. 12, 2012, 1008-1021.
27. Lai, A.C.H., Yu, D.Y. and Lee, J.H.W.\*, "Mixing of a rosette jet group in crossflow", *Journal of Hydraulic Engineering*, ASCE, Vol. 137, No. 8, 2011, 787-803.
28. Choi, K.W., Lee, J.H.W.\*, Kwok, K.W.H., and Leung, K.M.Y., "Integrated stochastic environmental risk assessment of the Harbour Area Treatment Scheme (HATS) in Hong Kong", *Environmental Science and Technology*, Vol. 43, No. 10, 2009, 3705-3711.
29. Mao, J.Q., Lee, J.H.W.\* and Choi, K.W., "The Extended Kalman Filter for forecast of algal bloom dynamics", *Water Research*, Volume 43, Issue 17, 2009, 4214-4224.
30. Wong, K.T.M., Lee, J.H.W.\*, and Harrison, P.J., "Forecasting of environmental risk maps of coastal algal blooms", *Harmful Algae*, Vol.8, Issue 3, 2009, 407-420.
31. Yu, D.Y. and Lee, J.H.W.\*, "Hydraulics of tangential vortex intake for urban drainage", *Journal of Hydraulic Engineering*, ASCE, Vol. 135, No. 3, 2009, 164-174.
32. Harrison, P.J., Yin, K.D., Lee, J.H.W.\*, Gan, J.P., and Liu, H.B., "Physical-biological coupling in the Pearl River Estuary", *Continental Shelf Research*, Vol. 28, 2008, 1405-1415.
33. Choi, K.W. and Lee, J.H.W.\*, "Distributed entrainment sink approach for modelling mixing and transport in the intermediate field", *Journal of Hydraulic Engineering*, ASCE, Vol. 133, No. 7, 2007, 804-815.
34. Yu, D.Y., Ali, M.S. and Lee, J.H.W.\*, "Multiple tandem jets in crossflow", *Journal of Hydraulic Engineering*, ASCE, Vol. 132, No. 9, 2006, 971-982.
35. Lee, J.H.W.\*, Harrison, P.J., Kuang, C.P. and Yin, K.D., "Eutrophication dynamics in Hong Kong waters: physical-biological interactions", in *The Environment in Asia Pacific Harbours* (E.Wolanski, Ed.), Springer, 2006, 187-206 (invited chapter).
36. Lee, J.H.W.\*, Hodgkiss, I.J., Wong, K.T.M. and Lam, I.H.Y., "Real time observations of coastal algal blooms by an early warning system", *Estuarine, Coastal and Shelf Science*, Vol. 65, 2005, 172-190.
37. Choi, K.W. and Lee, J.H.W.\*, "Numerical determination of flushing time for stratified waterbodies", *Journal of Marine Systems*, Vol. 50, No. 3-4, 2004, 263-281.
38. Yu, I.T.S.\*, Li, Y.G., Wong, T.W., Tam, W., Chan, A.T., Lee, J.H.W., Leung, D.Y.C., and Ho, T., "Evidence of airborne transmission of the Severe Acute Respiratory Syndrome (SARS) virus", *New England Journal of Medicine*, Vol. 350, 2004, 1731-1739.

39. Lee, J.H.W.\* , Huang, Y., Dickman, M.D., and Jayawardena, A.W., "Neural network modelling of coastal algal blooms", *Ecological Modelling*, Vol. 159, 2003, 179-201.
40. Lee, J.H.W.\* , Chen, G.Q., and Kuang, C.P., "Mixing of a turbulent jet in crossflow – the advected line puff", in *Environmental Fluid Mechanics: theories and applications* (Ed. Hayley H. Shen et al), ASCE, Chapter 3, 2002, 47-83.
41. Lee, J.H.W.\* , Kuang, C.P., and Yung, K.S., "Fluid mechanics of triangular sediment oxygen demand (SOD) chamber", *Journal of Environmental Engineering*, ASCE, Vol. 126, No. 3, 2000, 208-216.
42. Chu, P.C.K., Lee, J.H.W.\* , and Chu, V.H., "Spreading of a turbulent round jet in coflow", *Journal of Hydraulic Engineering*, ASCE, Vol. 125, No. 2, 1999, 193-204.
43. Chu, V.H. and Lee, J.H.W.\* , "A general integral formulation of turbulent buoyant jets in crossflow", *Journal of Hydraulic Engineering*, ASCE, Vol. 122, No. 1, 1996, 27-34.
44. Lee, J.H.W.\* , Wu, R.S.S., and Cheung, Y.K., "Forecasting of dissolved oxygen in marine fish culture zone", *Journal of Environmental Engineering*, ASCE, Vol. 117, No. 6, 1991, 816-833.
45. Lee, J.H.W.\* , and Cheung, V., "Generalized Lagrangian model for buoyant jets in a current", *Journal of Environmental Engineering*, ASCE, Vol. 116, No. 6, 1990, 1085-1106.
46. Lee, J.H.W.\* and Neville-Jones, P., "Initial dilution of horizontal jet in crossflow", *Journal of Hydraulic Engineering*, ASCE, Vol. 113, 1987, 615-629.
47. Lee, J.H.W.\* and M.D. Greenberg, "Line momentum source in shallow inviscid fluid", *Journal of Fluid Mechanics*, Vol. 145, 1984, 287-304.
48. Lee, J.H.W.\* and Jirka, G.H., "Vertical round buoyant jet in shallow water", *Journal of the Hydraulics Division, Proc. ASCE*, Vol. 107, No. HY12, 1981, 1651-1675.

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