

KUA HARN WEI (Dr)

PhD (Building Technology) MIT, MSc (Theoretical Physics) NUS, Dual Masters (Technology & Policy; Civil & Environmental Engineering) MIT, BSc (Physics, 2nd Upper Hons) NUS



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CURRICULUM VITAE

ACADEMIC QUALIFICATIONS:

- Dual Masters (Civil & Environmental Engineering, and Technology & Policy), MIT, 2002
- Master of Science (by research), Theoretical Physics, National University of Singapore, 1999
- PhD (building technology), MIT, 2006

EMPLOYMENT RECORD:

- Associate Professor, NUS (2014 - present)
- Assistant Professor, NUS (2006 - 2014)
- Senior Tutor, NUS (2000 - 2006)
- Teaching Assistant, NUS (1999-2000)

ADMINISTRATIVE LEADERSHIP:

- Assistant Dean (Academic), 2016 – present
- Master, Kent Ridge Hall, 2021 – present
- Thrust Lead, Additive Manufacturing-enabled Design and Environment, AM.NUS, 2019 – present
- Leader, Smart Materials Laboratory, Department of Building, 2015 – present
- Deputy Head (Research), 2013 – 2016

PROFESSIONAL/CONSULTING ACTIVITIES:

- Board member, International Biochar Initiative, 2020 – present
- Associate Editor, Critical Review of Environmental Science and Technology
- Co-theme leader (on sustainable buildings and cities), International Sustainable Development Research Conference, 2014 – 2018
- Treasurer, Life Cycle Sustainability Assessment Section, International Society for Industrial Ecology, 2015-2017
- Reviewer for several top-tiered international peer-reviewed journals (such as Energy & Building) and international research grant organizations
- Conference track chairman or Scientific Committee member for numerous international conferences

- More than 80 invited speeches locally and internationally, including as speaker and instructor in the 1st Virtual European Structural Integrity Society (ESIS; est. 1978) Summer School 2020, Technical Committee 9 (TC-09; Concrete). Title of talk was “Biochar concrete/mortar: history, milestones, challenges and opportunities”.

UNDERGRADUATE TEACHING:

- PF2504 Materials Technology
- GES1019 Managing Singapore’s Built Environment

RESEARCH INTERESTS:

- Upcycling and valorization of biological waste into high performance smart building materials to promote sustainability, resilience and health of building users.
- Sustainability assessment of building materials and systems (with a focus on life cycle sustainability assessment and urban metabolism).

SELECTED PUBLICATIONS:

- Kua, H. W. and Maghimai, M., 2017. Steel-versus-Concrete Debate Revisited - Global Warming Potential and Embodied Energy Analyses based on an Attributional and Consequential Life Cycle Perspective, *Journal of Industrial Ecology*, 21 (1), 82-100. Nominated for the Journal of Industrial Ecology Best Paper of the Year Award (Graedel Prize) 2017
- Kua, H.W., 2017. On life cycle sustainability unified analysis. *Journal of Industrial Ecology*, 21(6), 1488-1506. Nominated for the Journal of Industrial Ecology Best Paper of the Year Award (Graedel Prize) 2018
- Gupta, S., Kua, H.W. and Low, C.Y., 2018. Use of biochar as carbon sequestering additive in cement mortar. *Cement and Concrete Composites*, 87, 110-129 (listed as one of the “Most Cited Articles” (since 2017) by Cement and Concrete Composites; FWCI of this paper was 6.32 as of 30 December 2020)
- Huang, B., Wang, X., Kua, H.W., Geng, Y., Bleischwitz, R. and Ren, J., 2018. Construction and demolition waste management in China through the 3R principle. *Resources, Conservation and Recycling*, 129, 36-44 (listed as one of the “Most Cited Articles” (since 2017) by Resources, Conservation and Recycling; recognized by Web of Science it as a “Highly Cited Paper” in 2018, which means that, as of November/December 2018, it is placed in the top 1% of the academic field of “Environment/Ecology” based on a highly cited threshold for the field and publication year; attained “home-run” status by getting a FWCI > 20 (20.37), on 22 June 2021).
- Wang, L., Chen, L., Cho, D.W., Tsang, D.C., Yang, J., Hou, D., Baek, K., Kua, H.W. and Poon, C.S., 2019. Novel synergy of Si-rich minerals and reactive MgO for stabilization/solidification of contaminated sediment. *Journal of Hazardous Materials*, 365, 695-706 (recognized by Web of Science as a “Highly Cited Paper” in 2020; attained “home-run” status by getting a FWCI > 20 (i.e. 26.28), on 10 August 2019)
- Kua, H.W., Gupta, S., Aday, A.N. and Srubar III, W.V., 2019. Biochar-immobilized bacteria and superabsorbent polymers enable self-healing of fiber-reinforced concrete after multiple damage cycles. *Cement and Concrete Composites*, 100, pp.35-52.
- Dissanayake, P.D., You, S., Igalavithana, A.D., Xia, Y., Bhatnagar, A., Gupta, S., Kua, H.W., Kim, S., Kwon, J.H., Tsang, D.C. and Ok, Y.S., 2020. Biochar-based adsorbents for carbon dioxide capture: A critical review. *Renewable and Sustainable Energy Reviews*, 119, 109582 (recognized by Web of Science as a “Highly Cited Paper” in 2021).
- Gupta, S., Muthukrishnan, S. and Kua, H.W., 2021. Comparing influence of inert biochar and silica rich biochar on cement mortar–Hydration kinetics and durability under chloride and sulfate environment. *Construction and Building Materials*, 268, p.121142. Attained “home-run” status by getting a FWCI > 20 (i.e. 21.51), on 26 May 2021.

AWARDS:

- A total of more than 60 local or international academic and community service-related awards
- Annual Teaching Excellence Award, 2011/2012 and 2013/2014
- SDE Teaching Award, 2010/2011, 2011/2012, 2012/2013, 2013/2014, 2014/2015, 2015/2016, 2016/2017, 2017/2018
- SDE Teaching Excellence Award Honor Roll 2018, School of Design & Environment, National University of Singapore.
- Bellagio Centre Academic Writing Residence fellow, Rockefeller Foundation, 2014
- Fellow, Brown International Advanced Research Institute, 2012
- Invited and funded (by Santander) to attend the Globalization TrendLab workshop (on “Sustainability: New Perspectives and Opportunities”), hosted by Lauder Institute, Wharton School, University of Pennsylvania, USA, 9-13 April 2012.
- ASEAN Environmentally Sustainable Cities Award 2008, 2011
- MIT Martin Family Society of Fellow for Sustainability (2002-2003)
- MIT Carroll L. Wilson Fellow (2001)